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Dissertation

Master in Management

Reputation and Stock Abnormal Returns

Fábio Miguel Sousa Pereira

Leiria, September 2016

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Dissertation developed under the supervision of Doctor Lígia Febra, professor at School of Technology and Management of the Polytechnic Institute of Leiria and co-supervision of Doctor Magali Costa, professor at School of Technology and Management of the Polytechnic Institute of Leiria.

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Resumo

A relação entre reputação organizacional e desempenho financeiro das empresas tem sido alvo de estudo ao longo dos últimos anos. Empresas com elevados padrões de reputação apresentam maior probabilidade de manter um elevado e sustentado desempenho ao longo do tempo. Seguindo esta linha de pensamento, acionistas que investem em empresas com elevada reputação exigem menos rendibilidades, uma vez que, à partida, o risco a que estão sujeitos é menor.

Com o intuito de estudar se empresas com elevada reputação, medida pela presença no ranking de 2015 *World's Most Admired Companies* da revista Fortune, rejeitam a hipótese das rendibilidades anormais serem iguais a zero, garantindo, por sua vez, um risco inferior, foram utilizados dados em painel que incluem 24,486 observações, entre 26 de dezembro 2014 e 1 de janeiro 2016, de uma amostra total de 462 empresas norte americanas cotadas nos índices bolsistas NYSE e NASDAQ.

Palavras-chave: reputação, desempenho financeiro, rendibilidades anormais, risco

Abstract

The relationship between organisational reputation and firms' financial performance has been subject of study over the last few years. Firms with high reputation standards experience higher chances of keeping a sustained superior performance over the course of time. Following this logic, shareholders who invest in firms with high reputation, expect smaller stock returns, since the risk that they are exposed is smaller.

In order to learn if reputable firms, measured by its presence in the 2015 World's Most Admired Companies ranking of Fortune's magazine, reject the assumption of abnormal returns being equal to zero, securing in turn a lesser risk, it has been used a panel data analysis which includes 24,486 firm-year observations, between December 26^{th}, 2014 and January 1^{st}, 2016, of a full sample of 462 U.S. firms listed in the NYSE and NASDAQ stock exchanges.

Keywords: reputation, firms' financial performance, abnormal returns, risk

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List of Acronyms

CAPM - *Capital Asset Pricing Model*

FE - *Fixed Effects*

GICS - *Global Industry Classification Standard*

Gretl - *Gnu Regression, Econometrics and Time-series Library*

MERCO - *Spanish Monitor of Corporate Reputation*

NASDAQ - *National Association of Securities Dealers Automated Quotations*

NYSE - *New York Stock Exchange*

OLS - *Ordinary Least Squares*

RE - *Random Effects*

RQ - *Reputation Quotient*

SPSS - *Statistical Package for the Social Sciences*

U.S. - *United States*

WMAC - *World's Most Admired Companies*

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Chapter 1

Introduction

There is a formal acknowledge that reputation plays an important role on firms strategic responses to environmental threats, as Walker (2010), Fombrun and Shanley (1990), and Roberts and Dowling (2002) demonstrated on their researches. Several studies concerning reputation and firms' behaviour have been made over the years by a wide range of authors. For Weigelt and Camerer (1988), reputation is described as an asset derived from firms' past actions, and it might be related with firms' future rents. Consistent with that, Vergin and Qoronfleh (1998) also believed that firms could develop reputation by means of their past financial performance indexes. Therefore, a positive reputation is highly valued by firm's shareholders and stakeholders. Regarding such positions, further authors, including Barnett et al. (2006) and Pfarrer et al. (2010), continued to explore how reputation might act as a strategic performance tool for firms.

Additionally, Roberts and Dowling (2002) also confirmed such relationship between corporate reputation and firms' performance. According to this authors, firms with better reputation standards outperformed their rivals, conclusion that led Roberts and Dowling (2002) to support the hypothesis that reputation might become a strategic resource for firms. Moreover, and since reputation is rare and difficult to imitate, Roberts and Dowling (2002) believed that reputation might be also responsible for increasing firms' profitability and to the creation of competitive barriers. Besides, in a literature review performed by Chun (2005), reputation has been characterised as an effective tool on managing the stakeholders' behaviour towards an organisation. Chun (2005) described such behaviour as employee retention, customer satisfaction and loyalty, and good staff attraction. Furthermore, Chun (2005) also described that reputation might encourage shareholders to invest in a firm, since reputation is positively correlated with superior overall returns, although adjusted to the risk.

Concerning the firms' financial performance overview, good reputation standards may also lead to a decrease on firms' costs, enabling those firms to charge premium prices within their actual and future markets (Roberts and Dowling, 2002).

In the light of this literature addresses about reputation, Walker (2010) mentioned how important should reputation receive constant management attention, due to its increasing significance on competitive markets.

Therefore, the research's aim is to analyse if firms listed on the 2015 ranking of Fortune's World's Most Admired Companies yield abnormal returns and a small systematic risk. Then, we will proceed to the analysis of firms' returns, comparing both from firms listed on Fortune and not listed in the same ranking. After that, we will tie both concepts in order to understand how the abnormal returns, as well as the systematic risk, behave from situation one, firms listed on Fortune, to situation two, firms not listed on Fortune. To accomplish that, we will use a sample of 462 U.S. firms quoted in the NYSE and NASDAQ stock exchanges. Half of this sample concerns to firms listed on Fortune's WMAC, wherein the other half relates to firms outside of this ranking in the year of 2015.

In the light of the previous events, we expect to have some change on the abnormal returns, as well as in the systematic risk, when comparing firms listed on Fortune to firms not listed in the same ranking. In order to accomplish that, we will propose an adaptation on CAPM along with a panel data study between December 26^{th}, 2014 and January 1^{st}, 2016.

This document is structured as follows: chapter 2 explores some academic reviews, wherein a broader understanding about reputation is undertaken, such as some literature current definitions, measuring tools, and its association to organisations' financial performance. Chapter 3 focuses on the empirical study, including the research hypotheses and main objectives, sample and data descriptive analysis, and model's description. In chapter 4 we present and discuss the main results of our research. Finally, chapter 5 concludes, with some guidelines for future investigation.

Chapter 2

Literature Review

This chapter has the main purpose to present some academic background that supports our research. On the prosecution of such goal, we introduce in this chapter some definitions about corporate reputation, as well as some measures on what reputation relies. We will further present in this chapter some past empirical researches concerning the relationship between corporate reputation and firm's financial performance.

2.1 Corporate Reputation Definitions

According to Boyd et al. (2010), reputation has been one of the most important strategic resources allocated to organisations. The same authors suggested that reputation helps to distinguish firms from competitors, reducing information asymmetry and consumer uncertainty, and substituting for expensive governance mechanisms.

Regarding previous researches, Weigelt and Camerer (1988) defined corporate reputation as a set of attributes assigned to firms, inferred from firms' past actions. Concerning the position of Fombrun and Shanley (1990), reputation signals stakeholders about how a firm's products, jobs, strategies, and prospects compare to those of competing firms. Alike, Hammond and Slocum (1996) expressed that reputation plays an important role within organisations, since investment bankers, corporate managers, and recruiters routinely rely on firm's reputation in making a wide range of decisions.

Additional literature, for instance Fombrun and Van Riel (1997), identified six different constructs for corporate reputation:

- The economic view portrays reputation as a character trait that describes a firm's probable behaviour in a particular situation;
- The strategic view defines reputation as an intangible asset that is difficult for rivals to imitate, acquire, or substitute, providing their owners a sustained competitive advantage. Nevertheless, and cited by Fombrun and Shanley (1990), Caves and Porter (1977) accomplished that established reputation may prevent managers' strategic responses to environmental events and it is thus a distinct source of intra-industry structure;
- In a marketing approach, reputation, also defined as brand image, describes the corporate associations that individuals establish with the firm's name;
- In the organisational field of study, corporate reputation represents a firm's culture and identity, which shapes a firm's business practices within their stakeholders. Notwithstanding, the desire to protect reputation may inhibit firms and their managers from engaging in activities that constituents consider unacceptable (Fombrun and Shanley, 1990);
- The sociological vision highlights the reputational rankings as part of the social construct emanated from the relationship that firms establish with stakeholders in their shared institutional environment. Thus, reputation is an indicator of legitimacy, in other words, reputation aggregates assessments of firm's performance relative to expectations and norms in an institutional field;
- By last, the accounting perspective, which has been started to develop better measures of how investments in branding, training, and research build important intangible assets, considering the created value of those activities. Additional literature highlighted the potential for value creation throughout reputation (Roberts and Dowling, 2002), wherein it might be seen as an intangible asset (Chun, 2005; Fombrun and Van Riel, 1997; Pfarrer et al., 2010), hard for competitors to copy or acquire, endowing their owners with a sustained competitive advantage (Fombrun and Van Riel, 1997; Roberts and Dowling, 2002).

Nonetheless, a jointly definition was recommended by Fombrun et al. (2000) who suggested that corporate reputation denotes a collective construct that describes the aggregate perceptions of multiple stakeholders over the firm's operation. Since corporate

performance is a multi-dimensional construct, so is reputation, wherein it should reflect the unique dimensions on what stakeholders base their judgements about the firm's performance.

A research from Vergin and Qoronfleh (1998) noticed that reputation attracts and keeps talented people, so the customers are more willing to purchase the firm's existing products and services. Furthermore, sources of funding, equity and debt, are easier to obtain if investors and bankers perceive the firm favourably. However, bad corporate reputation might concern a firm with a demand or sales decrease, resulting from a state of distress, situation that could occur when the fixed obligations to creditors cannot be met (Altman, 1984; Haugen and Senbet, 1978).

With those proposed approaches across reputation, Barnett et al. (2006) claimed the urgency to create a unifying framework. One of the main barriers to the creation of a universal definition was related to the confusion concerning the concepts of identity, image, and reputation. Trying to achieve such definition, Barnett et al. (2006) presented the following: "observers collective judgements of a corporation based on assessments of the financial, social, and environmental impacts attributed to the corporation over time".

2.2 Reputation Measures

According to Chun (2005) and Fombrun et al. (2000), media rankings are the most standard measures for reputation, wherein literature highlights the Fortune's World's Most Admired Companies as one of the most cited. Concerning the Brown and Perry (1994) research, Fortune's annual list of the Most Admired Companies, published early each year since 1983, ranks of large corporations on the following eight qualitative attributes: (1) financial soundness, (2) long-term investment value, (3) use of corporate assets, (4) innovativeness, (5) quality of firm's management, (6) quality of its products and services, (7) ability to attract, develop, and keep talented people, and (8) acknowledgement of social responsibility. Following Brown and Perry (1994), Fortune collects data on the largest firms in over 30 industries, on what 8,000 executives, directors, and market analysts are included in the survey sample, wherein each of whom reports on the industry they follow. Literature also emphasises other annual worldwide reputation rankings such as the Financial Times World's Most Respected Companies, the Britain's Most Admired Companies from Management Today, and the Asia's Most Admired Companies by Asian Business (Chun, 2005; Fombrun et al., 2000).

Meanwhile, and according to Fombrun et al. (2000), the scale design for reputation rankings widely employed by business media might not adequately measure the reputation construct. The same authors defended that most surveys might restrict their samples to larger firms, limiting consideration of emerging companies and industries. According to the same authors, rankings also restrict to public traded firms. Fombrun et al. (2000) also believed that those surveys relied on the perceptions of a limited respondent pool that over-represents senior managers, directors, and financial analysts, not including the different views from other key stakeholders.

Considering some biased information and a high correlation between the eight attributes inferred on the Fortune's surveys, Fombrun et al. (2000) developed an alternative measure instrument for corporate reputation, known as the Reputation Quotient (RQ), a multi-dimensional reputation scale, which has been presented as being more reliable and robust. They assumed that corporate reputation can be explained by six central reputation dimensions that influence stakeholders' behaviour and a firm's profits (Walsh and Wiedmann, 2004). Those six dimensions identified in the RQ may be defined as (1) emotional appeal, (2) products and services,(3) vision and leadership, (4) workplace environment, (5) social and environment responsibility, and (6) financial performance (Walsh and Wiedmann, 2004).

Concerning such information regarding some weaknesses about media rankings, the Fortune's WMAC survey will be endowed in this research. According to Brown and Perry (1994), Fortune's WMAC ranking has been a response rate over to 50 percent, indicator that described Fortune's survey samples as probably the largest within their environment. Brown and Perry (1994) also underlined that Fortune's results are widely circulated and cited in popular press outlets. Besides, it offers data from a large sample of industry experts assessing qualitative dimensions of organisational performance that are difficult to measure quantitatively. Also McGuire et al. (1990) classified Fortune's rankings as some of the most comprehensive and widely broadcast surveys of managerial attributes available. Moreover, Hammond and Slocum (1996) also believed that the quality of respondents is comparable to those that could be obtained elsewhere since respondents only rate firms with which they are familiar.

Numerous authors trusted on media rankings. For instance, Carmeli and Tishler (2005); Fombrun and Shanley (1990); Hammond and Slocum (1996); McGuire et al. (1990); Pfarrer et al. (2010); Roberts and Dowling (2002); Stuebs and Sun (2010) took advantage from Fortune's rankings, where respondents rate firms in their own industry or economic sector based on the eight key attributes.

Notwithstanding, there were some researchers who used other media rankings to measure reputation. Tischer and Hildebrandt (2014), for instance, took advantage from reputational rankings designed by the German business periodical *Manager Magazin*, published in a two-year cycle between 1992 and 2008. This media ranking used to survey by phone senior executives, wherein they had to rate around 40 companies using an eleven-point rate scale. Further researches, as the one from Sánchez and Sotorrío (2007), considered the Spanish Monitor of Corporate Reputation (MERCO) instead of media rankings. According to such authors, this measurement tool for reputation (MERCO) asked managers to evaluate the different firms according to six first-level variables: (1) economic-financial results, (2) quality of the product-service, (3) corporative culture and labour and ethical quality, (4) corporate social responsibility, (5) overall size and international presence, and (6) innovation. This first-level variables were in turn reduced to other second-level variables. Finally, Raithel and Schwaiger (2015), on the other hand, measured reputation employing a seven-point Likert scale, where respondents were asked to answer about the 30 leading German securities listed on the Deutsche Aktienindex (DAX).

The previous information regarding some reputation measures employed in prior academic researches, is summarised on the following table 2.1.

Table 2.1: *Reputation Measures Review*

Authors	***Reputation Measures***
Fombrun and Shanley (1990) *McGuire et al. (1990)* *Hammond and Slocum (1996)* *Roberts and Dowling (2002)* *Carmeli and Tishler (2005)* *Stuebs and Sun (2010)* *Pfarrer et al. (2010)*	This authors applied on their researches media rankings on measuring reputation. Those rankings were based on Fortune's lists.
Tischer and Hildebrandt (2014)	Such author also measured reputation with support from media rankings designed by the German business periodical *Manager Magazine*.
Sánchez and Sotorrío (2007)	This author measured reputation according to the Spanish Monitor of Corporate Reputation (MERCO).
Raithel and Schwaiger (2015)	In this research, the author used a seven-point Likert scale in order to measure reputation.

2.3 Corporate Reputation and Firms' Financial Performance

As seen in the previous sections, literature highlighted several researches concerning the relationship between reputation and corporate performance. In the extent of such approaches, we further present some empirical findings regarding that relationship.

Several authors, such as Fombrun and Shanley (1990); Hammond and Slocum (1996); McGuire et al. (1990); Pfarrer et al. (2010); Roberts and Dowling (2002); Stuebs and Sun (2010), confirmed the existence of a relevant and positive relationship between corporate reputation and firms' financial performance, using the Fortune's rankings as measure for reputation. For instance, Fombrun and Shanley (1990) conducted a research with the purpose to analyse the relationship between reputation building and information regarding firm's financial performance. Some firm's financial performance indicators were obtained from market and accounting data as well as from institutional and strategy indexes. To accomplish the research's purpose, Fombrun and Shanley (1990) carried out a cross-sectional time series study, explaining reputation derived from prior-year accounting data. With a sample of 292 U.S. firms from a 1985 study of corporate reputation achieved by Fortune, Fombrun and Shanley (1990) believed that stakeholders appear to construct reputation from a mix of signals originated from accounting and market information, media reports, and other non-economic measures.

Similarly, Hammond and Slocum (1996) explored the association between reputation and firm's financial performance. Therefore, the authors assembled a sample 149 firms from a 1993 Fortune's Most Admired list. Findings from Hammond and Slocum (1996) suggested that management, in order to keep their firm's reputation, must be able to control costs and deliver dividends to investors as close to their expectations as possible. Thus, and according to the same authors, the short-term profit should not be the single goal of management, since most investors are risk averse.

A prior research from McGuire et al. (1990) examined two issues concerning the formation and effects of qualitative perceptions of firm's financial performance. First, the authors tried to understand if firms' quantitative measures of performance influence perceptions about the firm's management quality. Second, McGuire et al. (1990) studied if perceived firms' qualities affect measures of firm's financial performance. In order to conduct a research over the above two issues, the authors built a sample of 131 U.S. firms, considering an annual survey of corporate reputation accomplished by Fortune's

magazine in 1983. Through correlations and regression analysis, McGuire et al. (1990) found that firm and management quality influence a firm's future financial performance. However, the same findings denoted that growth in sales and operate income performed a little impact on future evaluations of firm's quality.

Likewise, Pfarrer et al. (2010) explored the effects of two intangible assets, (1) firm's reputation and (2) celebrity, in organisational outcomes. To perform that, the same authors observed 291 firms between 1991 and 2005 which appeared on the Fortune's Most Admired Companies. Findings led Pfarrer et al. (2010) to suggest that reputable firms, when comparing to low-reputable ones, might experience greater market rewards for positive surprises, and smaller market penalties for negative announcements.

Additionally, Roberts and Dowling (2002) also studied corporate reputation and its possible correlation with a sustained superior firm's performance over time. To execute such goal, Roberts and Dowling (2002) used reputation data from 540 firms, between 1984 and 1998, embedded in the Fortune 1000 annual ranking[1]. Results supported the evidence that superior-performing firms with good reputation standards, found themselves with an advantage which is durable on the short run. Nevertheless, Roberts and Dowling (2002) highlighted the fact that reputation might become less relevant over time, allowing the possibility to hurt superior-performing firms in the long run.

In order to empirically investigate corporate reputation's linkage with labour efficiency, productivity, and costs, Stuebs and Sun (2010) compared firms listed on Fortune's Most Admired Companies with a similar set of matched firms not listed on such ranking. With a two-sample merging process, Stuebs and Sun (2010) became with a final sample of 224 U.S. firm-year observations. Results confirmed that reputation was positively associated with improved labour efficiency and productivity, reflecting such improvements on the overall firm's performance.

There were other authors, such as Sánchez and Sotorrío (2007); Tischer and Hildebrandt (2014); Raithel and Schwaiger (2015), who also explored and found positive associations among corporate reputation and firms' financial performance. On this researches, media measures, including Fortune, for reputation, were replaced by other non-media measure tools.

Sánchez and Sotorrío (2007), for instance, proposed a theoretical model which could explain the process of value creation from reputation generated by firms. Therefore,

[1]Fortune 1000 is a list created by Fortune magazine detailing the 1,000 largest companies in the U.S. based on their revenues

the same authors built a sample containing the 88 most reputable firms in Spain during 2004. In this situation, Sánchez and Sotorrío (2007) based their reputation data on MERCO, a Spanish indicator about firms' reputation. Results obtained suggested that the process of value creation by firms, by means of their reputation, was moderate or influenced by a series of contingent factors such as differentiation strategy, competitive intensity, and power of stakeholders.

In order to investigate whether announcing significant positive or negative changes of corporate reputation measures affect shareholders' value in the same direction, Tischer and Hildebrandt (2014) conducted an event study with the attempt to explore the impact of reputation rankings' publication on share prices in the Frankfurt stock exchange. Results suggested that the publication of reputation rankings performed an impact on shareholders' value. As expected, Tischer and Hildebrandt (2014) believed that whether a positive or negative announcement effect exists if the relative ranking position has significantly improved in comparison to competitors.

Literature also denoted a recent research from Raithel and Schwaiger (2015). This study demonstrated how shareholder's value, measured by future stock returns, behaved in terms of reputation perceptions issued by the general public. According to this, Raithel and Schwaiger (2015) took part from a sample that ranged from 1,251 to 2,465 telephone interviews, were respondents were asked to answer about the 30 leading German securities listed on DAX. Results attested that superior reputation perceptions issued by the general public increased shareholder's value, creating more wealth to the shareholder in terms of positive abnormal stock returns in the long term. Furthermore, Raithel and Schwaiger (2015) indicated that reputation perceptions that are driven by non-financial aspects might create significantly more shareholder's value in the future than reputation perceptions driven by previous financial performance.

According to literature, there are some other authors who achieved different results from those previously presented. Carmeli and Tishler (2005), for instance, explored the relationship between organisational reputation and firm's financial performance taking advantage from 86 industrial firms based on Israel. The authors showed through descriptive statistics and a path analysis that reputation was associated with firm's growth and accumulation of customers' orders, but it was not directly associated with market share, profitability, and financial strength.

Additionally, Rose and Thomsen (2004) used image ratings instead of reputation from a Danish business periodical. The authors performed descriptive statistics and a factor analysis with support from 263 joint firm-year observations, between 1996 and 2001,

of image and market-to-book value from a sample of 62 firms. According to Rose and Thomsen (2004), research findings came to challenge the conventional wisdom, since results confirmed that corporate reputation did not impact the firm's value. Nonetheless, the same findings corroborated the hypothesis that firm's financial performance improves corporate reputation.

In the extent of the prior literature analysis, we further illustrate, on table 2.2, the researches previously analysed, itemised by author, reputation measures used on each research, some firm's financial performance indicators, and the main achievements, whether positive or negative, concerning the association between corporate reputation and firms' financial performance.

Table 2.2: *Literature Review - A Broadened Analysis*

Authors	***Reputation Measures***	***Performance Measures***	***Findings***
Fombrun and Shanley (1990) *McGuire et al. (1990)* *Hammond and Slocum (1996)* *Roberts and Dowling (2002)* *Pfarrer et al. (2010)*	Media rankings based on Fortune's lists.	Market and accounting measures.	Positive association between reputation and firm's performance.
Carmeli and Tishler (2005) *Stuebs and Sun (2010)*	Media rankings based on Fortune's lists.	Firms' financials and labour efficiency.	This authors found some positive associations between reputation and firm's financial performance. However, further achievements were obtained denoting no evidence between reputation and labour cost advantage, market share, firm's profitability, or financial strength.
Tischer and Hildebrandt (2014)	Media rankings designed by the German business periodical *Manager Magazin.*	Cash flows generated by firms' operations.	Publication of reputation rankings had a positive impact on shareholders' value.
Sánchez and Sotorrío (2007)	MERCO	Accounting measures of performance (ROA).	The building process of reputation was influenced by differentiation strategy, competitive intensity and stakeholders' power.
Rose and Thomsen (2004)	Image ratings from a Danish business periodical.	Market-to-book value.	No association between corporate reputation and firm's value.
Raithel and Schwaiger (2015)	Seven-point Likert scale.	Market and accounting measures (ROA and Market Value).	Shareholders' value increased in terms of positive abnormal stock returns in the long term.

Chapter 3

Research Design

This chapter characterises the empirical investigation and it is organised as follows: objectives and hypotheses, methodology, sample selection and data collection.

3.1 Objectives and Hypotheses

As seen in the previous chapter, the relationship between corporate reputation and firm's financial performance has received some attention in the scientific field. This research follows that association widely described in literature. Roberts and Dowling (2002), for instance, realised that firms which possess relatively good reputation standards experience higher chances of sustaining superior performance over time. Sharpe (1964) described expected returns as an inverse function of systematic risk, thus, since a greater reputation implies a decrease over the systematic risk exhibition, we expect to verify if shareholders who invest in highly reputable firms, such as those listed on Fortune, expect smaller stock returns due to the less systematic risk they undergo, when comparing with those who invest on firms with low reputation standards.

In line with Hammond and Slocum (1996) and Pfarrer et al. (2010), we will use the Fortune's WMAC ranking of 2015 to measure reputation. As Barnett et al. (2006) mentioned on their research, reputation might be seen as the stakeholders' insight on a firm's attributes over time, such as financial, social, and environmental. Since Fortune's rankings measure reputation on large firms respecting some qualitative attributes, including financial, innovativeness, overall quality, human resource practices, and social responsibility, we may argue then that Fortune's WMAC 2015 suits our research purposes. Moreover, Fortune only ranks quoted companies and, as we will narrow our sample to firms listed on both NYSE and NASDAQ stock exchanges due

to an easy acquisition on firm's data, we recognise another positive attribute on using Fortune's WMAC 2015. Thus, some of the weaknesses about Fortune's rankings previously denoted in literature by Fombrun et al. (2000), for instance, are not relevant on this research.

With respect to the previous information, we present our research hypotheses:

> *H1: Firms listed on Fortune's WMAC experience a lower systematic risk when comparing to those not listed in the same ranking.*

> *H2: Firms listed on Fortune's WMAC undergo into different abnormal returns when comparing to those not listed in the same ranking.*

3.2 Methodology

In order to perform our research, we will take advantage from an adaptation of the Capital Asset Pricing Model (CAPM). This model, according to Fama and French (2004), offers powerful foresights about how to measure risk and the relation between expected return and risk. Also known as the Sharpe-Lintner CAPM (1964;1965), later explored by some authors, including Jensen (1967), Fama (1968) and Black (1972), is based on the assumptions that (1) all investors are risk averse, (2) all investors have identical decision horizons and homogeneous expectations regarding investment opportunities, (3) all investors are able to choose among portfolios solely on the basis of expected returns and variance of returns, (4) all transaction costs and taxes are zero, and (5) all assets are infinitely divisible (Jensen, 1967).

Following Jensen (1967) and the hypothesis that the capital market is in equilibrium, the CAPM model yields the following expression:

$$E(R_i) = R_f + \beta * [E(R_m) - R_f]$$

Where:

$E(R_i)$ = the expected one-period return on asset i.
R_f = the one-period risk free interest rate.

β = the measure of risk.
$E(R_m)$ = the expect one-period return on the "market portfolio".

According to Fama and French (2004), the CAPM is also used to measure the performance of mutual funds and other managed portfolios. Dating to 1968, Jensen estimated a CAPM time-series regression model, using the intercept Jensen's *alpha* to measure abnormal performance (Fama and French, 2004). Regarding such information, the updated CAPM model can be represented as:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i * (R_{m,t} - R_{f,t}) + \varepsilon_{i,t}$$

Considering the prior information, we will use the intercept α to measure abnormal returns, considering a division between firms listed on Fortune and firms not listed in the same ranking. Thus, our model yields the following expression:

$$R_{i,t} - R_{f,t} = \alpha^{nrep} + \beta^{nrep} * (R_{m,t} - R_{f,t}) + \alpha^{rep} * D_i + \beta^{rep} * D_i * (R_{m,t} - R_{f,t}) + \varepsilon_{i,t}$$

All variables and parameters embedded in our model are described on the following table 3.1.

Table 3.1: *Variables/Parameters Description*

Variables/ Parameters	***Description***
$R_{i,t}$	Return of stock i on week t.
$R_{f,t}$	Risk free return on week t.
$R_{i,t} - R_{f,t}$	Risk premium of stock i on week t.
α^{nrep}	Constant parameter for estimation which denotes the abnormal returns of firms not listed on Fortune.
β^{nrep}	Coefficient for estimation which measures the sensibility of stock returns from firms not listed on Fortune due to changes on market returns.
$R_{m,t}$	Market return on week t.
$R_{m,t} - R_{f,t}$	Market risk premium on week t.
α^{rep}	Constant parameter for estimation which denotes the variation of abnormal returns from firms listed on Fortune, when comparing to those not listed in the same ranking.
D_i	Dummy variable coded 1 if firm i is listed on Fortune in year 2015, otherwise 0.
β^{rep}	Coefficient for estimation which measures the sensibility's change of stock returns from firms listed on Fortune due to variations on market returns, when comparing to those not listed on Fortune.

To perform this model we got through a set of estimations provided by *gretl*, a specific software for statistical ends. Running a panel data analysis, we explored the *Pooled OLS*, the *Fixed-effects*, and the *Random-effects* models. Each estimation went over some tests, such as the *F Test*, the *Breusch-Pagan Test*, or the *Hausman Test*, in order to determine the models' quality and its consequent validation. Finished this step, we also compared the estimations, according to the *Schwarz criterion*, to obtain a parsimonious model.

3.3 Sample and Data

Financial data, including price and market value from NYSE and NASDAQ constituents, was obtained from Thomson Reuters Datastream each Friday between December 26^{th}, 2014 and January 1^{st}, 2016. Additionally, we collected similar financial information from S&P 500 Composite and NASDAQ 100 from the same database, regarding the same time period. With this values we were able to calculate the stock and market's returns, using the continuously compounded return formula. Finally, the *Risk free return on week t* ($R_{f,t}$) was obtained considering the '4-week Treasury Bill Secondary Market rate', available in the Board of Governors of the Federal Reserve System[1] between December 26^{th}, 2014 and January 1^{st}, 2016.

Our research's sample was supported by 462 U.S. firms listed on NYSE and NASDAQ observed each Friday from December 26^{th}, 2014 to January 1^{st}, 2016, achieving a total of 24,486 observations. From those 462 U.S. firms, 358 were listed on NYSE, whereas 104 were quoted on NASDAQ. Since more than 70% of all firms listed on Fortune's WMAC 2015 ranking were based in the United States of America stock exchanges, we focused then on U.S. firms.

In order to achieve a final sample of 462 U.S. firms, we first managed an analysis on the Fortune's WMAC where, from a list of 350 worldwide firms, we only selected U.S. firms, as seen before, which were listed on NYSE or NASDAQ stock exchanges, fulfilling a sample of 231 firms. Then, we built a matched sample of U.S. firms which were not listed on Fortune. To accomplish that, we selected, according to the higher market value, a list of 231 firms from NYSE and NASDAQ stock exchanges that were not listed on Fortune's WMAC in the 2015 ranking.

The previous information is summarised in the following table 3.2.

Table 3.2: *Sample Split According to the Fortune's WMAC Ranking*

		NASDAQ	***NYSE***	***Total***
Reputation	Listed on Fortune's WMAC	52	179	231
	Not Listed on Fortune's WMAC	52	179	231
Total		**104**	**358**	**462**
Percentage		**22,5**	**77,5**	

[1] http://www.federalreserve.gov/releases/h15/data.htm

The prior table 3.2 allowed us to infer that 77,5% of our sample was composed by firms listed on NYSE while 22,5% comported to firms indexed on NASDAQ. The same table also provides information regarding the sample's split, where both reduced samples equally represent the total of firms listed on Fortune and those not listed in the same ranking.

Next we present some graphs describing our sample in terms of sectors' activity. We took into consideration the Global Industry Classification Standard (GICS) as methodology for sectors' classification.

In the first graph, presented on figure 3.1, we explored the sectors activity for the NASDAQ stock exchange, by means of their firms' classification: (1) Listed on Fortune WMAC, and (2) Not Listed on Fortune WMAC. *Consumer Services* and *Technology* were the sectors with more enrolments on Fortune's WMAC, with nearly 20% of the corresponding sample. Those, along with *Health Care*, were also the sectors with more firms which did not appear on the 2015 Fortune's WMAC ranking, up to 15%.

The second graph, illustrated on the same figure 3.1, clearly denoted a different scenario. Analysing the sectors activity for the NYSE stock exchange, we identified *Consumer Goods*, *Consumer Services*, *Financials*, and *Industrials* as the sectors with more firms listed on Fortune's WMAC, with 6% to 12% of the corresponding sample. *Financials* also appeared as the sector with more firms which were not ranking on Fortune, with nearly 12%, followed by *Oil & Gas* and *Industrials*.

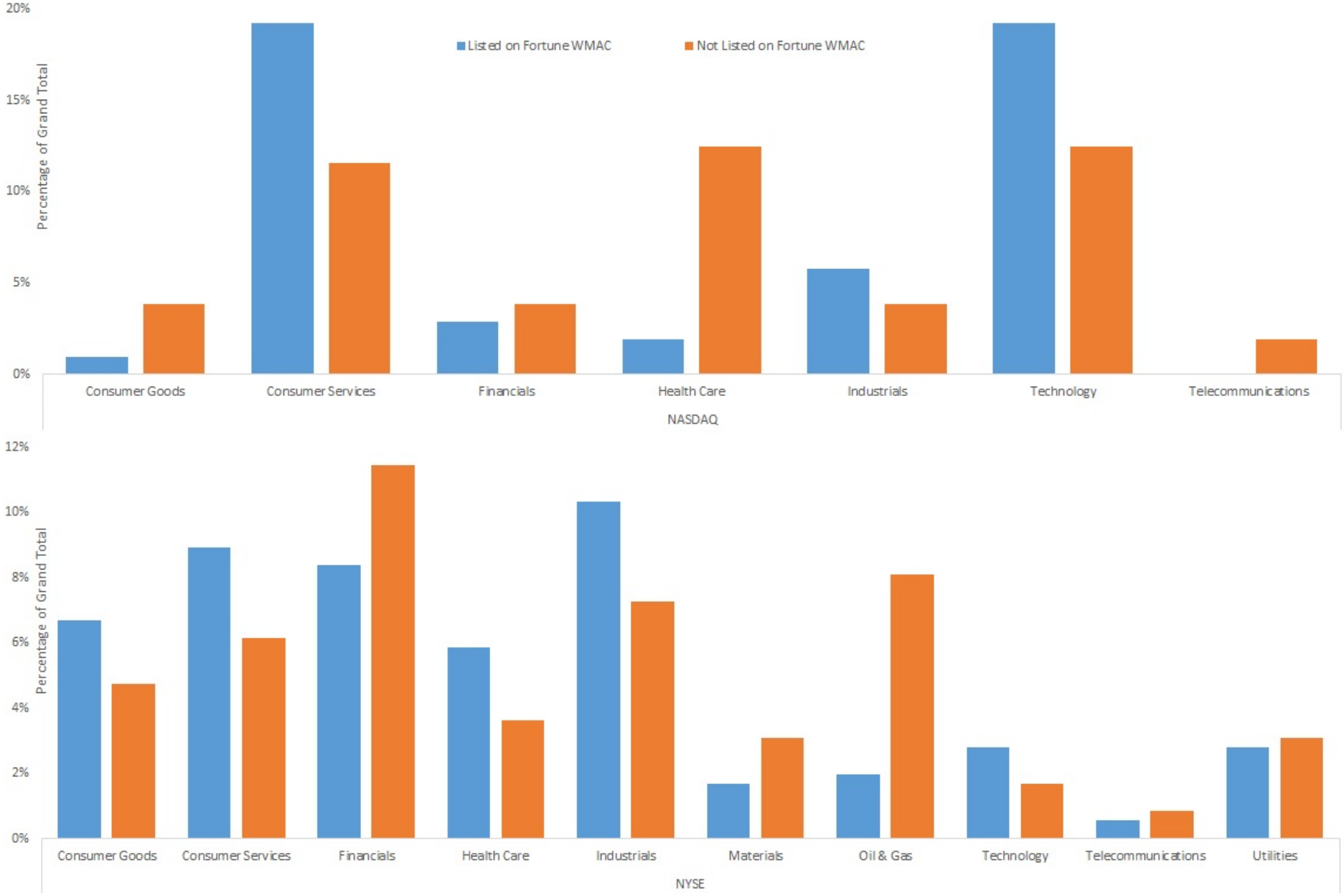

Figure 3.1: *Sector Reputation Activity by Stock Exchange*

In the following table 3.3 we explored and analysed some descriptive statistics measures regarding the stock returns' variable previously obtained. Comparing both maximum values in table 3.3 we concluded that firms listed on Fortune's WMAC experience greater positive stock returns comparing to those not listed on Fortune. When analysing both minimum values, we denoted that negative sock returns can be larger for firms listed on Fortune.

Concerning both mean and median values, we may argue that whether listed on Fortune's WMAC or not, both type of firms experience negative stock returns. The median values led us to believe that nearly 50% of our sample's stock returns were negative. Moreover, the median value was lower for firms listed on Fortune's WMAC.

Table 3.3: *Sample's Descriptive Statistics*

Number of Observations (2015) - 24,486				
Weekly Stock Returns				***Statistic***
	Listed on Fortune WMAC	Mean		-0,001359888
		95% Confidence Interval for Mean	Lower Bound	-0,001987245
			Upper Bound	-0,000732530
		Median		-0,000591891
		Minimum		-0,378517546
		Maximum		0,5427290490
	Not Listed on Fortune WMAC	Mean		-0,001119483
		95% Confidence Interval for Mean	Lower Bound	-0,001776644
			Upper Bound	-0,000462323
		Median		-0,000481812
		Minimum		-0,350053786
		Maximum		0,3904249350

Next, we perform a non-parametric analysis. To accomplish such analysis we will use the *Independent-samples Mann-Whitney U test* which explores the *Weekly Stock Returns* grouped into two categories: (1) Not Listed on Fortune's WMAC, and (2) Listed on Fortune's WMAC. The *Mann-Whitney U test* yields the following null hypothesis:

> *H0: The distribution of weekly stock returns is the same across the two categories previously presented as (1) Firms Not Listed on Fortune's WMAC, and (2) Firms Listed on Fortune's WMAC.*

Test's results are bestowed in the next table 3.4.

Table 3.4: *Mann-Whitney U Test for Mean Values*

Number of Observations (2015) - 24,486

Weekly Stock Returns		***N***	***Mean Rank***	***Statistics*** (*p-value*)
	Not Listed on Fortune WMAC	12243	12264,80	
	Listed on Fortune WMAC	12243	12222,20	
Total		24486		
			Mann-Whitney U Test	0,637

Concerning the previous outcome, we advanced, for 10% significance level, that the distribution of weekly stock returns was the same across the two sample's categories, since we did not reject the null hypothesis. In other words, there is no statistically significant difference between the mean rank values of both sample's categories.

Chapter 4

Empirical Results and Discussion

4.1 Results

In the previous chapter, we identified our hypotheses as well as the methodology required to accomplish our research's aim. As earlier defined in our methodology, we decided to perform a panel data analysis across 24,486 firm-year observations. Since panel data studies can be explored through some standard approaches, including *Pooled OLS*, *Fixed-effects*, and *Random-effects* models, we first needed to choose the one that better fits our research purposes. Thus, in order to achieve a parsimonious model, we estimated those three models, so we could perform some tests, including the *F Test* and the *Hausman Test*, and compare some criteria between models, in order to select one for analysis.

Regarding the prior approach on panel data analysis, we first explored the *F Test* to understand which the *Pooled OLS* or the *Fixed-effects* should we select. Since the null hypothesis was rejected for 1% significance level, see table 5.2 in appendices, then the *Fixed-effects* model will be endowed.

Considering such findings, we conducted a second analysis between *Fixed* and *Random-effects*. According to Clark and Linzer (2015), researchers often rely in the *Hausman Test* to decide between *Fixed-effects* or *Random-effects*. This test has been designed to detect correlation between the independent variable and the unit effects (Clark and Linzer, 2015). As illustrated in the next table 4.1, we did not reject the null hypothesis for 1% significance level, thus no correlation was found between the independent variable and the unit effects. Therefore we should reject the *Fixed-effects* in favour of the *Random-effects* model.

Additionally, Baltagi and Li (1991) cited the *Breusch-Pagan Test* as an extent measure to analyse *Random-effects*'s quality. According to this authors, the null hypothesis in this test is that variance across entities is zero. Since we rejected the null hypothesis for 1% significance level, we concluded that the *Random-effects* model is statistically suitable.

In the next table 4.1, we present the results obtained from estimating the *Random-effects* model.

Table 4.1: *Random-effects Model's Estimation*

Model: Random-effects (GLS), using 24,486 observations
Included 462 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.00107582	0.000315513	0.0007 ***
β^{nrep}	0.874907	0.0140408	0.0000 ***
α^{rep}	−0.000238568	0.000446202	0.5929
β^{rep}	0.0318310	0.0198567	0.1089

Schwarz criterion	−99846.65
Breusch-Pagan Test:	with p-value = 0.000481291
Hausman Test:	with p-value = 0.228707

Results presented on table 4.1 disclose that the positive variation hold by the systematic risk β of firms listed on Fortune's WMAC is not statistically significant, thus we cannot verify that firms listed on Fortune's WMAC experience a lower systematic risk then those not listed in the same ranking, as hypothesised.

Results concerning the abnormal returns α of firms listed on Fortune's WMAC did not support our second hypothesis that firms listed on Fortune's WMAC undergo into different abnormal returns when comparing to those not listed in the same ranking. Regarding such results we cannot reject the hypothesis of such variation on abnormal returns of firms listed on Fortune's WMAC being equal to zero, when comparing to those firms not listed in the same ranking.

In the light of this events, we further analyse the results robustness in order to observe if different results exist, from those previous obtained, when estimating for each stock exchange (NYSE and NASDAQ), and for each sector.

4.2 Results Robustness

To perform the results robustness, we took into consideration two main constructs. First, we analysed according to stock exchange where firms were listed (NYSE and NASDAQ). In a second approach, we managed the results robustness taking into consideration a sector analysis.

4.2.1 Stock Exchange Robustness Analysis

To accomplish this analysis, the overall sample was split by stock exchange (1) NYSE, and (2) NASDAQ. Thereafter, a panel data analysis was carried out for each stock exchange.

Since the total number of observations was different after the sample's split, the *Random-effects* was not assumed as standard estimation model. Regarding such information, we executed, at first, the *Pooled OLS* and the *Fixed-effects* estimations. According to the *F Test*, we rejected, for 1% significance level, the *Pooled OLS* in favour of the *Fixed-effects* model (see table 5.4 in appendices).

The previous decision led to a second analysis between the *Fixed-effects* and the *Random-effects* models. Since the *Hausman Test* was not provided when estimating the *Random-effects* model, the *Breusch-Pagan Test* was used to compare both models, as illustrated on table 4.2. Since the null hypothesis was rejected for 1% significance level, we proceeded, according to Baltagi and Li (1991), with the *Random-effects* model.

Results are bestowed in the following table 4.2.

Table 4.2: *RE Estimation: NYSE Stock Exchange Robustness Analysis*

Model: Random-effects (GLS), using 18,974 observations
Included 358 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.00124348	0.000340552	0.0003 ***
β^{nrep}	0.921507	0.0162778	0.0000 ***
α^{rep}	0.000160911	0.000481613	0.7383
β^{rep}	0.00367422	0.0230203	0.8732

Schwarz criterion	−79407.36
Breusch-Pagan Test:	with p-value = 0.00191428
Hausman Test:	with p-value = NA

In the previous table, regarding a panel data analysis across the NYSE stock exchange, we observed, without statistics significance, a positive deviation in the systematic risk's variation of firms both listed on NYSE and Fortune's WMAC. Such analysis supports the previous obtained results.

Analysing the abnormal returns α, we denoted a positive deviation in the abnormal returns' variation of firms simultaneous listed on Fortune's WMAC and NYSE. Therefore, such difference is not statistically significant, thus our initial results are verified.

In line with this findings, the initial results were corroborated by this robustness test.

Next we perform a panel data analysis across the NASDAQ stock exchange.

As standard procedure, we first estimated the *Pooled OLS* and *Fixed-effects* models. Regarding the *F Test*, the null hypothesis was not rejected for 1% significance level (see table 5.5 in appendices). This result led us to reject the *Fixed-effects* model in favour of the *Pooled OLS*.

Results from estimating the *Pooled OLS* model are illustrated in the next table 4.3.

Table 4.3: *OLS Estimation: NASDAQ Stock Exchange Robustness Analysis*

Model: Pooled OLS, using 5,512 observations
Included 104 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.000319752	0.000696699	0.6463
β^{nrep}	0.779530	0.0283824	0.0000 ***
α^{rep}	−0.00172442	0.000985281	0.0801 *
β^{rep}	0.0916616	0.0401388	0.0224 **

Schwarz criterion −20811.52

When analysing the systematic risk β in the previous table 4.3, a statistically significant increase was found for a 5% significance level over the systematic risk's variation of firms both listed on Fortune's WMAC and NASDAQ stock exchange, when comparing to those not listed on Fortune. Such results did not meet our initial findings. However, it also did not corroborate our first hypothesis, on what firms listed on Fortune's WMAC experience a lower systematic risk when comparing to those not listed in the same ranking.

Analysing the abnormal returns α on table 4.3, we observed, for a 10% significance level, a significant negative deviation on the abnormal returns' variation of firms both listed on Fortune's WMAC and NASDAQ stock exchange. The current analysis also did not meet the initial findings. Besides, such evidence supports the second research hypothesis, on what firms listed on Fortune's WMAC undergo into different abnormal returns when comparing to those not listed in the same ranking. In this situation, we are able to reject the hypothesis that such variation on abnormal returns of firms listed on Fortune's WMAC is equal to zero, when comparing to those firms not listed in the same ranking.

In the next subsection, a results robustness is performed for a detailed sector's estimation.

4.2.2 Sector Activity Robustness Analysis

In this second approach, we performed a results robustness across our results with respect to sectors wherein firms were classified according to the GICS methodology. As illustrated on figure 3.1, our sample is dispersed over ten major sectors. Therefore, we coded the variable sector into nine dummy variables.

Following the same methodology previous applied, first we conducted a *Pooled OLS* and *Fixed-effects* estimations. Regarding the *F Test*, the null hypothesis was not rejected for 1% significance level (see table 5.7 in appendices). Such result led us to select the *Pooled OLS* model instead of the *Fixed-effects*.

Table 4.4: *OLS Estimation: Sector's Robustness Analysis*

Model: Pooled OLS, using 24,486 observations
Included 462 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	0.00115879	0.000591025	0.0499 **
β^{nrep}	0.874235	0.0140516	0.0000 ***
α^{rep}	−0.000784603	0.000414462	0.0584 *
β^{rep}	0.0324128	0.0198709	0.1029
$SecD1$	−0.00170066	0.000754018	0.0241 **
$SecD2$	−0.00148306	0.000735979	0.0439 **
$SecD3$	−0.000256490	0.000825679	0.7561
$SecD4$	−0.00187953	0.000746015	0.0118 **
$SecD5$	−0.00447310	0.00118433	0.0002 ***
$SecD6$	−0.00711084	0.000915442	0.0000 ***
$SecD7$	−0.00224533	0.000825971	0.0066 ***
$SecD8$	−0.00177007	0.00172451	0.3047
$SecD9$	−0.00320585	0.00109032	0.0033 ***

Schwarz criterion −99834.37

Results regarding the systematic risk β presented in the previous table 4.4 revealed, without statistics significance, a positive deviation on the systematic risk's variation of firms listed on Fortune's WMAC, when comparing to those not listed in the same ranking. Such analysis corroborates our initial results.

Analysing the abnormal returns α, we observed, for a 10% significance level, a negative deviation on the abnormal returns's variation of firms listed on Fortune's WMAC. Such results did not meet our prior findings. Besides, this analysis supports the second research hypothesis, wherein firms listed on Fortune's WMAC undergo into different abnormal returns when comparing to those not listed in the same ranking.

This results robustness analysis also indicates that there are clearly some sectors performing a significant impact in the dependent variable. This might explain the significant variation observed on the abnormal returns α of firms listed on Fortune's WMAC. Since the first research hypothesis, regarding a systematic risk decreasing over firms listed on Fortune's WMAC was not observed in this situation, perhaps it will be interesting to perform a panel data analysis for each sector, and eventually for each stock exchange with a sector's detailing estimation.

Chapter 5

Conclusions

We broadly introduced over the current research some concepts about reputation, as well as its implications across organisations as Weigelt and Camerer (1988), Fombrun and Shanley (1990), Roberts and Dowling (2002), and Walker (2010) documented on their researches. This relationship was in the basis of this research, among with other finance key concepts, including the abnormal returns and the systematic risk concepts.

In this extent, we built the research model, which mainly consisted on relating firms' abnormal returns with firms' reputation, measured by Fortune's WMAC ranking of 2015.

According to the documented literature, we should expect, for reputable firms, small abnormal returns, since the risk shareholders are willing to take is smaller when comparing to those firms with small market capitalisation.

Achieving a sample of 462 U.S. firms listed on NYSE and NASDAQ stock exchanges, wherein 231 of those firms were also listed on Fortune's WMAC, we counted 24,486 observations occurred each Friday between December 26^{th}, 2014 and January 1^{st}, 2016. Therefore, we converted such data into a panel data estimation, performed by *gretl* software.

Estimation results did not provide us significant deviations, whether for the systematic risk or for the abnormal returns of firms listed on Fortune's WMAC. Therefore, without statistics support, we could not verify both of our research hypotheses, wherein firms listed on Fortune's WMAC might experience a lower systematic risk and, as well, they might incur into different abnormal returns when comparing to those firms not listed on Fortune's WMAC.

When testing our results robustness, we observed some deviations from our main results. Analysing the results robustness by stock exchange, we observed that for firms quoted in the NASDAQ stock exchange, which represent nearly 23% of our sample, there were significant changes in the systematic risk, as well as in the abnormal returns of firms listed on Fortune's WMAC.

When analysing our results robustness with a sector's decomposed estimation, we observed some sectors with a clear significant influence over our results.

With this said, it will be interesting, for further researching, analyse possible abnormal returns and systematic risk changes from firms not listed on Fortune, or other media ranking, to firms listed on Fortune taking into consideration the sector were firms are based.

Since we did not obtain significant results, we could not validate our research hypotheses. Possible effects might concern the fact that we included in our sample only quoted firms from both NYSE and NASDAQ stock exchanges, most of all large market capitalisation firms which did not necessarily bring huge returns to shareholders in a short period of time. Thus, for further researching, it will be necessary to perform a similar research wherein the sample might include firms from emerging markets.

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Appendices

Appendix 5.1: *Pooled OLS Estimation*

Model: Pooled OLS, using 24,486 observations
Included 462 cross-sectional units / Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
const	−0.00107582	0.000284469	0.0002 ***
$R_m - R_f$	0.875015	0.0140705	0.0000 ***
D_i	−0.000238581	0.000402301	0.5532
$D_i * (R_m - R_f)$	0.0315943	0.0198987	0.1124

Schwarz criterion −99846.65

Appendix 5.2: *Fixed-effects Estimation*

Model: Fixed-effects, using 24,486 observations
Included 462 cross-sectional units / Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
const	−0.00119510	0.000200702	0.0000 ***
$R_m - R_f$	0.874450	0.0140467	0.0000 ***
$D_i * (R_m - R_f)$	0.0328368	0.0198651	0.0983 *

Schwarz criterion	−95771.74
F Test	p-value = 0.000413

Appendix 5.3: *OLS Estimation: NYSE Stock Exchange Robustness Analysis*

Model: Pooled OLS, using 18,974 observations
Included 358 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.00124348	0.000306285	0.0000 ***
β^{nrep}	0.921507	0.0163147	0.0000 ***
α^{rep}	0.000160911	0.000433152	0.7103
β^{rep}	0.00367422	0.0230725	0.8735

Schwarz criterion −79407.36

Appendix 5.4: *FE Estimation: NYSE Stock Exchange Robustness Analysis*

Model: Fixed-effects, using 18,974 observations
Included 358 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.00116302	0.000216086	0.0000 ***
β^{nrep}	0.921507	0.0162778	0.0000 ***
β^{rep}	0.00367422	0.0230203	0.8732

Schwarz criterion −76345.90

F Test p-value = 0.00139051

Appendix 5.5: *FE Estimation: NASDAQ Stock Exchange Robustness Analysis*

Model: Fixed-effects, using 5,512 observations
Included 104 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.00118196	0.000491598	0.0162 **
β^{nrep}	0.779530	0.0283224	0.0000 ***
β^{rep}	0.0916616	0.0400539	0.0221 **

Schwarz criterion	−20059.20
F Test	p-value = 0.0600285

Appendix 5.6: *RE Estimation: NASDAQ Stock Exchange Robustness Analysis*

Model: Random-effects, using 5,512 observations
Included 104 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.000319752	0.000770633	0.6782
β^{nrep}	0.779530	0.0283224	0.0000 ***
α^{rep}	−0.00172442	0.00108984	0.1136
β^{rep}	0.0916616	0.0400539	0.0221 **

Schwarz criterion	−20811.52
Breusch-Pagan Test:	with p-value = 0.142668
Hausman Test:	with p-value = NA

Appendix 5.7: *FE Estimation: Sector's Robustness Analysis*

Model: Fixed-effects, using 24,486 observations
Included 462 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	−0.00119510	0.000200702	0.0000 ***
β^{nrep}	0.874450	0.0140467	0.0000 ***
β^{rep}	0.0328368	0.0198651	0.0983 *

Schwarz criterion	−95771.74
F Test:	with p-value = 0.098037

Appendix 5.8: *RE Estimation: Sector's Robustness Analysis*

Model: Random-effects (GLS), using 24,486 observations
Included 462 cross-sectional units/Time-series length = 53
Dependent variable: $R_i - R_f$

	Coefficient	Std. Error	p-value
α^{nrep}	0.00115879	0.000615652	0.0598 *
β^{nrep}	0.874252	0.0140409	0.0000 ***
α^{rep}	−0.000784597	0.000431732	0.0692 *
β^{rep}	0.0324466	0.0198558	0.1022
$SecD1$	−0.00170067	0.000785436	0.0304 **
$SecD2$	−0.00148306	0.000766647	0.0531 *
$SecD3$	−0.000256494	0.000860084	0.7655
$SecD4$	−0.00187953	0.000777101	0.0156 **
$SecD5$	−0.00447309	0.00123368	0.0003 ***
$SecD6$	−0.00711083	0.000953587	0.0000 ***
$SecD7$	−0.00224537	0.000860385	0.0091 ***
$SecD8$	−0.00177007	0.00179637	0.3245
$SecD9$	−0.00320585	0.00113576	0.0048 ***

Schwarz criterion	−99834.37
Breusch-Pagan Test:	with p-value = 0.35012
Hausman Test:	with p-value = 0.289874