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# Corporate Risk Reporting: A study of The Impact of Risk Disclosure on Firms Reputation

Wael Louhichi
*ESSCA School of Management*

Ousayna Zreik
*CREM Rennes*

## Abstract

In this paper, we explore the influence of the communication about potential risk within annual reports on firm reputation. We use the content analysis to measure the risk reporting; and we consider the Most Admired Companies list published in Fortune magazine as a proxy for reputation. Our findings highlight that risk reporting affects positively compagny reputation. We check the robustness of these results for alternative empirical models (pooled OLS, fixed effects, and random effects) and, in addition, for alternative measurement of reputation. Our results provide support to legitimacy theory, as the disclosure of risk's information is a part of a social contract that should be rewarded with good reputation. Furthermore, we examine the behavior of risk reporting for high and low-risk firms. We show that risk disclosure behavior is sensitive to level of risk.

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**Contact:** Wael Louhichi - wael.louhichi@essca.fr, Ousayna Zreik - ousaynazreik@ymail.com.
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## 1. Introduction

Numerous studies have examined the impact of voluntary and mandatory disclosure on firm reputation. Armitage and Marston (2008) reveal that the major motivations for firm disclosure of risk are enhancing the company's reputation for openness, as well as maintaining confidence in the company among shareholders and others. Beyer and Dye (2012) find that managers can build a strong reputation by disclosing even the most negative forecasts. Zeng et al. (2012) notice that firms with better reputations are more likely to disclose environmental information. While the prior literature suggests a connection between disclosure and company reputation, there is no study concerning the impact of risk disclosure on reputation. In addition, several of these papers have used pooled data and, in effect, ignore the impact of individual firms. Our study attempts to contribute to the existing literature in several ways. First, our objective is to examine whether more risk reporting through annual reports can improve company image and promote reputation. Second, we use a panel data methodology to control for heterogeneity among individual firms and compare the results of alternative empirical models. Furthermore, we aim in this study to contribute to legitimacy theory.

Despite the high risk of negative reactions from investors over less-than-excellent news, several firms are choosing to disclose more information about their operations, even the most negative. This high level of transparency may make companies more desirable among investors, and thereby contributes to improving firm reputation. Additionally, prior studies assume a positive link between transparency and reputation (Mazzola et al., 2006; Ussahawanitchakit, 2011; and Kongpunya et al., 2011). The purpose of this paper is to respond to two substantial questions. The first of these concerns the expected reaction of investors to risk communication. On the one hand, they may consider this information as risky and thus choose not to invest in the company, which they may deem undesirable**.** On the other hand, investors may consider this "negative" information to be a sign of transparency, which will incite them to invest in the company. The second question concerns the impact of company risk level on investor notions. Furthermore, we attempt to detect whether risk reporting for firms with very high-risk exposure has the same impact on reputation.

We use the "France's Most Admired Companies" list published in Fortune Magazine in order to measure company reputation. We measure risk disclosure by using "six risk word" lists (uncertain, weak model, negative, legal, opportunity and environment and social responsibility lists), by adopting Zreik and Louhichi's methodology (2015). We find that risk disclosure promotes reputation. This result is robust for alternative empirical models (pooled OLS, fixed effects, and random effects) and for alternative measurements of reputation. We also test the impact of different types of risk communication (uncertain, weak model, negative, legal, opportunity and environment and social responsibility) on reputation. The results show that these different types of risk words impact reputation in different ways. Furthermore, we conduct an additional analysis to test whether risk exposure has any impact on the relationship between risk reporting and reputation. We observe that for very high-risk firms, risk reporting does not impact the firm's reputation.

Our study reveals several interesting findings. First, we highlight the positive impact of communication about risk on the firm's reputation. Second, we find that pooled OLS over-estimates this impact. Our results provide support for the legitimacy theory, as we show that revealing more information about risks and uncertainty over annual reports is compensated with a positive reputation. To our knowledge, this study is the first that attempts to examine the impact of risk reporting on reputation in the French market. Our findings have implications for both theory and practice. First, the impact of risk disclosure on reputation does not dissent from the impact of total firm disclosure. Second, the results of our study encourage firms to be more transparent, even about their potential risk, to enhance their reputation.

The paper proceeds as follows. First, we present a brief literature review about the connection between reputation and firm disclosure. Second, we detail the data and research methodology. Our main findings are then presented, and we then verify the robustness of our results. Lastly, we summarize and conclude the paper.

## 2. Literature review

The importance of building a good reputation has received significant attention. Several studies consider reputation to be a powerful factor in organizational viability (Scott and Walsham, 2005; and Vidaver-Cohen and Brønn, 2013). Since reputation is considered to be a measure of investor perceptions of company performance (Scott and Walsham, 2005; Petkova et al., 2014; Rindova and Fombrun, 1999; Keh and Xie, 2009), the previous literature has tried to determine whether social responsibility can have an impact on reputation. Brammer and Pavelin (2004) notice that there is a positive link between reputation, measured by using the "Britain's Most Admired Companies" ranking, and social performance. In addition, they highlight that this connection is clearer for the biggest firms. As well as this, Maden et al. (2012) confirm that corporate social responsibility not only positively impacts reputation but also has a positive effect on investor, employee, and client behaviour. Moreover, Michelon (2011) shows that company reputation leads to improved sustainability disclosure by using an international sample (57 constituents of the Dow Jones sustainability index).

Very few studies have focused solely on analyzing the impact of risk reporting through annual reports on firm reputation, such as Chong (2013), who conducts a survey of the Hong Kong exchange market to investigate the effects of risk disclosure on corporate reputation, corporate trust and media visibility. The author concludes that the perceived importance of corporate reputation is connected with forms of corporate attributes in risk disclosure.

As mentioned above, the quantity and the quality of disclosure promote reputation regardless of whether this information is positive or negative. Our aim is to define whether communication about risk information has any impact on reputation. Moreover, we focus on the French market, since we observe a gap in the literature focusing on French firms.

## 3. Research Method

### 3.1. Sample design and data collection

The sample selection process begins with all firms listed in Euronext Paris and included the SBF120 Index between 2006 and 2011. After excluding 17 financial firms and checking and screening for apparent coding errors and missing data, a balanced panel data of 408 annual reports of 68 firms remained for the estimation. The electronic annual reports were gathered from the firms' websites or by sending an e-mail to firms when the reports could not be obtained from the website. As for reputation variables, we employ Fortune Magazine's reputation scores for six years (2006-2011). Because our focus is the French market, we use the annual lists compiled and published by Fortune Magazine, ranking the top French firms. We consider all firms on the Most Admired list and the Contenders list as high-reputation firms. The difference between these two lists (Most Admired and Contenders) is that to appear as Most Admired, a company must have scored in the top half of its industry survey. The rest are listed as contenders. The final sample of reputation scores were 97 French firms listed on Fortune Magazine's Most Admired list over 6 years.

**Table 1**

**Descriptive Statistics**

Table 1 presents descriptive statistics of our variables. The reputation scores are Fortune Magazine's reputation scores, published in its list of its "France's Most Admired Companies", the dummy variable of reputation is a dummy variable with a value of 1 for those firms with a score on Fortune Magazine's reputation scores and 0 otherwise. Risk disclosure is measured by counting the frequency of "six risk words" lists. Firm age is the number of years since the firm's founding. Firm value is measured by the natural logarithm of annual firm market capitalization. Research and development expenditure is the annual expenditure for research and development. Market to book ratio is market capitalization divided by book value of equity.

| Variable | Mean | Std.Dev | Min | Max |
|---|---|---|---|---|
| Reputation scores | 5.965567 | .8096758 | 3.4 | 7.26 |
| Dummy variable of reputation | .2279412 | .4200195 | 0 | 1 |
| Risk disclosure | 3362.1 | 3165.527 | 0 | 21728 |
| Firm age | 78.46324 | 69.39085 | 1 | 347 |
| Firm value | 8.439835 | 1.320575 | 5.317195 | 11.7849 |
| Research and development expenditures | 298365.8 | 483337 | 0 | 3152000 |
| Market to book ratio | 2.255812 | 2.129365 | -1.62 | 34.25 |

We use several control variables: firm age, market capitalization, research and development expenditure and market to book value. The market capitalization, book value, research and development expenditure, and firm age data were derived from DataStream**.** Table 1 summarizes the descriptive statistics of our variables. We notice that reputation scores range from 3.4 to 7.26 with a small standard deviation of approximately 0.81 and a mean of about 6. The risk disclosure variable goes from 0 to 21728 risk words; this interprets the high standard deviation (3166). Firm age, logarithm of market capitalization, research and development expenditure and market to book ratio are ranked between 1 and 347, 5 and 12, 0 and 3152000 and -2 and 34 respectively with 69, 1.32, 483337 and 2.13 standard deviation respectively.

### 3.2. Variables: measurement and description

To measure risk disclosure (our independent variable), we follow Zreik and Louhichi (2015). Therefore, we consider "six risk words" lists (Uncertain, Opportunity, Negative, Weak form, Legal and Government Regulations and Environmental and Social Responsibility words). We thus find 306 uncertain words, 25 opportunity words, 2184 negative words, 32 weak words, 889 legal and government regulations words, and 67 environmental and social responsibility words. We measure total risk disclosure by calculating the total frequency of these risk words in the annual reports.

For the dependent variable (firm reputation), we use two proxies. The first is the reputation scores obtained from Fortune Magazine's reputation scores, published with its list of "France's Most Admired Companies" (Philippe and Durand, 2011, Pfarrer et al., 2010 and Basideo et al., 2006) and its list of "France's Contenders" companies. The second one is a dummy variable which distinguishes between those firms with a score in Fortune Magazine's

reputation scores, published with its list of "France's Most Admired Companies" and those without a score (Delgado-García et al., 2013). We use the second proxy in order to test the robustness of our findings.

The previous literature proposes several variables to use as controls for the reputation model. Ussahawanitchakit et al. (2011) use firm experience, measured by the number of employees currently working for a firm; firm capital, which was measured by the amount of capital invested; and finally, firm reward, which was measured by the recognized awards a firm has won. Hasseldine et al. (2005) use the beta, return on equity, industry, size (sales turnover), research and development expenditure and corporate diversification. Philippe and Durand (2011) use industry dummies; in addition, they include year dummies to control for inter-year variability. They also use age as the logged number of years a firm has been operating, size measured as a yearly logged measure of total assets, and performance by using two-year average return on assets. Little et al. (2009) study how reputation explains variation in the market to book value, and they obtain significant results in finding that firms with high market to book ratio have a lower corporate reputation rate. We control our model for firm age measured by the logarithm of the number of years since creation, firm size measured by the natural logarithm of annual market capitalization, research and development expenditure measured by the natural logarithm of annual research and development expenditure, and market to book ratio measured by the annual average of daily market to book ratio. Prior studies suggest a positive impact of firm age, firm size, market to book, and research and development expenditures on the firm's reputation (Deephouse and Carter, 2005; Little et al., 2009; and Hasseldine et al., 2005).

### 3.3. Estimation Technique

To investigate the relationship between company reputation and risk disclosure, we estimate the following models:

Basic model:

$$Scores_{it} = \alpha_1 + \alpha_2 RD_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it} \quad (1)$$

Robustness test model:

$$RepD_{it} = \alpha_1 + \alpha_2 RD_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it} \quad (2)$$

Where Scores is Fortune Magazine's reputation scores, published with its list of "France's Most Admired Companies", RepD is the reputation dummy variable with a value of 1 for those firms with a score on Fortune magazine's reputation scores, and 0 otherwise, RD is the total number of risk words, Lage is the log of number of years since creation, Lmc is the annual market capitalization log, LReDe is the annual research and development expenditure log, and mtb is the annual average of daily market to book ratio.

As stated before, our data are organized in panel data. Panel data control for individual heterogeneity by suggesting that individuals are both heterogeneous and homogeneous. Moreover, this gives more informative data, more variability, less collinearity, and a greater degree of freedom (Hsiao, 2003 and Klevmarken, 1989). In order to empirically test whether an association exists between risk disclosure and the firm's reputation scores, we use three models (pooled OLS, fixed effects and random effects) for the reputation score model (equation 1). In addition, we use pooled logistic, random-effects and fixed effects logistic models for the reputation dummy variable (equation 2). In using the fixed effects model, we assume that the individual may impact or bias the predictors. The fixed effects model removes this effect and tabulates the net effect of the predictors on the outcome variable (Wooldridge, 2002 and Christopher, 2006). Another important assumption of the fixed effects model is that

this impact of the individual is unique and should not be correlated with other individual characteristics. Each entity is different, therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated, then the fixed effects model is not suitable. The random effects model supposes that the individual effects are held by the intercept and a random component. This random component is not correlated with the predictor. To choose between fixed and random effects, we use the Hausman test (Hausman, 1978). The null hypothesis is that the random effect is preferred because the errors are not correlated with the regressors. Moreover, we calculate the Lagrange multiplier (LM) test (Breusch and Pagan, 1980) that helps to choose between a random effects regression and a pooled OLS regression. The null hypothesis in the LM test is that variances across entities are zero. Furthermore, we provide several statistical tests to examine the validity of our results, such as the Wooldridge test for autocorrelation for panel data, and the variance inflation factor (VIF) to test autocorrelation for the pooled OLS model.

## 4. Empirical Results and Discussion

In this section we display the results from the different tests in several stages. First, we detail the results regarding total risk reporting. We then present the results regarding "risk word" lists. After that, we present the robustness test. Lastly, we carry out a raft of additional analyses to recognize the impact of the level of a firm's risk on this relation (the association between risk disclosure and company reputation).

### 4.1. Findings regarding total risk reporting

Table 2 reports the regression results for equation 1 using three different methodologies: pooled OLS, the fixed effects model, and the random effects model. The results show that risk reporting has a positive impact on company reputation at the 1% significance level for the pooled OLS and random effects model. The fixed effects model presents no significant association between risk disclosure and company reputation, but the F-test of the model was not significant (about 0.26, not tabulated). Regarding these findings, we conclude that the positive impact of risk reporting on reputation is robustness.

The point estimates range from 0.009% to 0.011%, suggesting that a firm's reputation level increases by about 0.009% to 0.011% when risk disclosure increases by 1%. The impact of control variables on reputation has unexpected signs, except company size: firm age measured by the logarithm of the number of years since founding has a negative impact on reputation and the logarithm of research and development expenditure is also negative and significant at the 1 % level. Book to market ratio has a negative and significant association with reputation at 10% for random effects. Firm size measured by the logarithm of market capitalization impacts positively and significantly on company reputation at the 1% level. To identify which empirical methodology (pooled OLS, fixed effects, or random effects) is most suitable, we carry out two statistical tests: first, the Lagrange multiplier test for random effects. The null hypothesis is that the variances across individuals are zero. The acceptance of the null hypothesis suggests that the random effects model is not preferred.

The results show that we cannot accept the null hypothesis. This means that the random effects model is more suitable than pooled regression. If we compare the two coefficients of both models we notice that the coefficient from the pooling regression equals approximately 1.2 times the coefficient of random effects regression. Thus, pooled OLS over-estimates the impact of risk reporting on reputation. Second, we perform the Hausman specification test (Hausman, 1978) to identify which model is more suitable (random or fixed effects). Under the Hausman test the null hypothesis suggests that the random effect model is preferred

because the errors are not correlated with the regressors. Looking at table 2, the null hypothesis is accepted and the random model is more suitable. We next address serial autocorrelation issues that might impact the estimation results. We perform a Wooldridge test that supposes no serial autocorrelation among variables as the null hypothesis. The results show an absence of autocorrelation.

**Table 2**

**The impact of total risk reporting on reputation scores**

Table 2 presents the results of pooled OLS, fixed effects and random effects model of the **equation (1)**:

$$Scores_{it} = \alpha_1 + \alpha_2 RD_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$

Scores is the Fortune magazine's reputation scores, published with its list of "France's Most Admired Companies", RD is the total number of "risk words", Lage is the log of the number of years since creation, Lmc is the log of annual market capitalization, LReDe is the annual research and development expenditure log, and mtb is the annual average of daily market to book ratio. The Lagrange multiplier test is used to test the random effects model versus pooling regression. The Hausman specification test is used to test the fixed effects model versus the random effects model. The variance inflation factor is tabulated to test the autocorrelation for pooling regression. The Wooldridge test is used to test the serial autocorrelation for panel data.

* Significant at the 10 % level
** Significant at 5% level.
*** Significant at 1% level.

| Variable | | Pooled OLS | | Fixed effects | | Random effects | |
|---|---|---|---|---|---|---|---|
| Scores | Coef | P. Value | Vif | Coef | P.value | Coef | P.Value |
| RD | .00011*** | 0.000 | 1.25 | -.00003 | 0.631 | .00009*** | 0.011 |
| Lage | -.33232*** | 0.003 | 1.95 | -1.08430 | 0.219 | -.34345*** | 0.008 |
| Lmc | .42066*** | 0.000 | 2.01 | .36248 | 0.255 | .38992*** | 0.001 |
| LReDe | -.27125*** | 0.012 | 1.06 | -.02359 | 0.344 | -.24955** | 0.051 |
| mtb | -.02229 | 0.233 | 1.12 | .33707 | 0.286 | -.02798* | 0.106 |
| Constant | 6.087666*** | 0.000 | | 2.70076 | 0.640 | 6.29953*** | 0.001 |
| R-square | | | 0.37 | 0.01 | | 0.42 | |
| Mean VIF | | | 1.48 | Wooldridge test for autocorrelation | | | 0.2357 |
| Lagrange multiplier test for random effects | | | 0.0227 | Hausman fixed random effects test | | | 0.6807 |

As shown above, investors prefer firms that address their potential risk and their uncertainty more openly to firms that hide this kind of information. Managers should disclose even the risks and uncertainty companies are facing to build a good reputation, especially in view of the fact that firms with good reputations experience greater market rewards for positive surprises and smaller market penalties for negative surprises (Pfarrer et al., 2010). On the one hand, disclosing this negative information may cause stock price to fall short-term; but, at the same time, being clear and unambiguous can prevent damage to reputation in the long-run (Fuller and Jensen, 2002). On the other hand, opacity and vagueness in firm reporting hinders shareholder ability to discriminate good from bad projects at an early stage (Bleck and Liu, 2007); and consequently impacts reputation negatively. Our results are consistent with previous research. Beyer and Dye (2012) find that managers can build a strong reputation by disclosing even the most negative forecasts. Likewise, legitimacy theory is based on the idea that companies signal their legitimacy by disclosing clear and obvious information in their annual report (Watson et al., 2002). Furthermore, Shocker and Sethi (1973) show that every

firm has a social contract with society. The firm continues if it delivers socially desirable ends to society, and economic, social, or political benefits to the groups from which it derives its power. Hence, to disclose information about firm risks is a part of this social contract and it should be rewarded. Therefore, a good reputation is a kind of remuneration for the firm's legitimacy. Consequently, our results contribute to the literature on legitimacy theory, and indicate that disclosing more information about risks and uncertainties enhances the levels of public recognition of the firm's capabilities and output quality, as well as making the firm more distinctive within their parallel group. In a nutshell, investors prefer firms that publish all their information, be it positive or negative, to other firms that are less transparent.

Regarding control variables, the literature assumes that older and larger firms are more interesting to build a good reputation (Deephouse, 1996 and Deephouse and Carter, 2005). The empirical results of previous studies were not able to prove this theory. Philippe and Durand (2008) notice no significant association between firm age and reputation. On the contrary, Flatt and Kowalczyk (2011) find, as is the case in our results, a negative association between firm age and reputation. Hannan and Freeman (1984) point out that increasing trust takes time and older firms are more favored due to repeated interactions with other organizations and environments. In addition, we educe that bigger firms are more reputable than smaller ones, whereas Flatt and Kowalczyk (2011) find a negative relationship between these two variables. With regard to the research and development expenditure variable, we detect that expending more for research and development impacts reputation negatively. This result is not harmonious with our expectation and with Hasseldine et al. (2005), who find a positive link between research and development spending and reputation. In addition, our results show that book to market ratio does not promote reputation.

### 4.2. Findings regarding "risk word" lists

After verifying that the most suitable model is the random effects model[1], we run the random effects regression for each word list separately (Uncertain, Opportunity, Negative, Weak form, Legal and Government Regulations and Environmental and Social Responsibility words).

Table 3 indicates that "uncertain", "opportunity", "weak" and "environmental & social responsibility" word lists have a significant positive impact on reputation. Furthermore, the results indicate that "negative" and "legal & government regulations" word lists do not affect company reputation. This means that disclosing uncertain, opportunity and environmental and social responsibility information has a positive impact on how firms are perceived. Disclosing weak words and opportunity information impacts the firm's reputation more than other lists. The coefficients of the weak form list and the opportunity list are about 0.001 and 0.002 respectively. This means that firm's reputation level increases by about 0.1% to 0.2% when weak form and opportunity words disclosure increases by 1%, while the coefficients of uncertain and environmental & social responsibility word lists are approximately 0.0006 and 0.0002 respectively. The impact of the other variables is robust for several word lists. Firm size measured by market capitalization impacts company reputation positively for all word lists. In addition, the negative effect of firm age remains significant for all lists except the "weak form" list.

The negative sign of the research and development expenditures remains for all lists except the opportunity and legal & government regulations lists. Market to book ratio significantly and positively impacts a firm's reputation for three lists (uncertain, negative and environmental & social responsibility). Our created word lists have typically negative implications in a financial sense; however, the importance of these lists differs according to

[1] We obtained this result by performing Langrage and Hausman test; these tests are not tabulated.

the context and investor priority. Few academic papers have examined disclosure according to investor priority, which makes interpreting our results difficult. Loughran and McDonald (2013) find that a higher frequency of uncertain, weak, and negative words is associated with higher volatility. This positive association reflects the importance of this information. Surprisingly, our results show that the negative word list does not affect reputation; however, the coefficient has positive sign. Previous studies have found a positive impact of environmental disclosure and social responsibility on reputation (Hasseldine et al., 2005; Orlitzky and Benjamin, 2001). Fred Garcia and Ewing (2008) find that the firms that cede the litigation communication advantage to their adversaries may suffer significant reputational harm. According to this result, the number of lawsuits and legal issues that companies face may not impact reputation. Accordingly, investors consider companies that publish uncertain information (uncertain and weak form word lists) and future opportunities to be transparent. Moreover, environmental and social responsibility is an important concern for investors. Hence, disclosing this kind of information will improve company image and, consequently, reputation.

## Table 3

## The impact of "risk word" lists on reputation scores

Table 3 presents the results of the random effects model of **equation (1)** by using the word lists as an independent variable instead of total risk:

$$Scores_{it} = \alpha_1 + \alpha_2 Uncertain_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$
$$Scores_{it} = \alpha_1 + \alpha_2 Opportunity_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$
$$Scores_{it} = \alpha_1 + \alpha_2 Negative_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$
$$Scores_{it} = \alpha_1 + \alpha_2 Weak_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$
$$Scores_{it} = \alpha_1 + \alpha_2 L\&G_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$
$$Scores_{it} = \alpha_1 + \alpha_2 Env\&SR_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$$

Scores is the Fortune magazine's reputation scores, published with its list of "France's Most Admired Companies", Uncertain is the uncertain word list, Opportunity is the opportunity word list, Negative is the negative word list, Weak is the weak form word list, L&G is the legal and government regulations word list, Env & SR is the environmental and social responsibility word list, Lage is the log of number of years since creation, Lmc is the log of annual market capitalization, mtb is the annual average of daily market to book ratio, LReDe is the log of annual research and development expenditures.

* Significant at 10% level
** Significant at 5% level.
*** Significant at 1% level.

| Scores | Uncertain | Opportunity | Negative | Weak | L&G | Env &SR |
|---|---|---|---|---|---|---|
| RD | .00059*** (0.002) | .00107** (0.036) | .00029 (0.168) | .00156*** (0.007) | .00013 (0.337) | .00024* (0.056) |
| Lage | -.26634* (0.066) | -.34650** (0.037) | -.42794*** (0.015) | -.21949 (0.149) | -.34337** (0.050) | -.40530*** (0.014) |
| Lmc | .30774*** (0.009) | .36084*** (0.010) | .390457*** (0.009) | .22753* (0.063) | .31770** (0.027) | .44775*** (0.004) |
| LReDe | -.27856** (0.032) | -.10374 (0.515) | -.26314* (0.081) | -.27600** (0.035) | -.22262 (0.150) | -.26348* (0.078) |
| mtb | -.02901* (0.089) | -.02151 (0.206) | -.02915* (0.081) | -.02476 (0.160) | -.02463 (0.160) | -.03273* (0.069) |
| Constant | 7.01409*** (0.000) | 4.86326** (0.039) | 6.98112*** (0.001) | 7.64504*** (0.000) | 6.97066*** (0.001) | 6.46058*** (0.002) |
| R-square | 0.48 | 0.36 | 0.36 | 0.43 | 0.28 | 0.38 |

## 5. Additional analysis

We carry out a raft of additional analysis to ascertain whether risk reporting behavior differs according to the firm's risk level. To highlight such differentiation, we discriminate between very risky firms and other firms. Thus, all the firms in our sample are ordered by idiosyncratic risk level. We define very risky firms as those belonging to the highest decile of risk ordered idiosyncratic risk. Furthermore, we took into account additional criteria to split the sample and we obtained similar results. These results are not reported here but are available upon request.

Looking at table 4, we notice that the positive impact of risk reporting on company reputation no longer exists for very high-risk firms. In other words, this impact is significant only for low-risk firms. By comparing the results of table 2 with the results of table 4, we perceive that the results for entire sample suggest positive impact as same as the low-risk sample.

Table 4

The impact of total risk reporting on reputation scores according to idiosyncratic risk

Table 4 presents the results of the random effects model of the equation (1) for high-low risk firms.

$$\text{Scores}_{it} = \alpha_1 + \alpha_2 \text{RD}_{it} + \alpha_3 \text{Lage}_{it} + \alpha_4 \text{Lmc}_{it} + \alpha_5 \text{LReDe}_{it} + \alpha_6 \text{mtb}_{it} + \varepsilon_{it}$$

Scores is the Fortune magazine's reputation scores, published with its list of "France's Most Admired Companies", RD is the total number of risks words, Lage is the log of the number of years since creation, Lmc is log of annual market capitalization, LReDe is log of annual research and development expenditures, and mtb is the annual average of daily market to book ratio. Wooldridge test is used to test the serial autocorrelation for panel data.

* Significant at 10% level

** Significant at 5% level.

*** Significant at 1% level.

| Variable | Very high-risk firms | | low-risk firms | |
|---|---|---|---|---|
| Scores | Coef | P-value | Coef | P-value |
| RD | .0000374 | 0.697 | .0000739** | 0.020 |
| Lage | -.3163713** | 0.028 | -.3341193*** | 0.010 |
| Lmc | .2829109** | 0.028 | .3726672*** | 0.002 |
| LReDe | -.261189* | 0.064 | -.2520267** | 0.049 |
| mtb | -.0211148 | 0.233 | -.0260033 | 0.138 |
| Constant | 7.818128*** | 0.000 | 6.5346*** | 0.000 |
| Wooldridge test | 0.111 | | 0.132 | |
| R-square | 0.22 | | 0.40 | |

In summary, our results suggest that risk reporting for risky firms does not impact firm reputation. Company reputation reflects potential future performance (Fombrun and Riel, 1997; Delgado-García et al., 2013); it follows that firms at risk will not be preferable. In other words, since most investors are risk-averse, company risk is a determining factor of the impact of risk reporting on reputation. In general, firms can improve their image and enhance their reputation by lowering financial risk (Hammond and Slocum, 1996; Delgado-García et al., 2013). Accordingly, risk reporting for low-risk firms positively impacts reputation.

## 6. Robustness Test

We have shown that our findings are robust with regard to pooled OLS and random effects models. In this section, we aim to test the robustness of our results with respect to alternative measurements of the reputation variable. We use a dummy variable of reputation that equals 1 for those firms with a score in Fortune Magazine's reputation scores, published with its list of "France's Most Admired Companies", and 0 for those without a score. We estimate the equation 2: $RepD_{it} = \alpha_1 + \alpha_2 RD_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it}$

(2) Where RepD is the reputation dummy variable with a value of 1 for those firms with a score in Fortune Magazine's reputation scores, and 0 otherwise, RD is the log total number of risk words, Lage is the log of the number of years since creation, Lmc is the log of annual market capitalization, LReDe is the log of annual research and development expenditure, and mtb is the annual average of the daily market to book ratio.

**Table 5**
**The impact of total risk reporting on the reputation dummy variable**

Table 5 presents the results of pooled logistic, conditional fixed effect logistic and random effects logistic regressions of the **equation (2)**:

$$RepD_{it} = \alpha_1 + \alpha_2 RD_{it} + \alpha_3 Lage_{it} + \alpha_4 Lmc_{it} + \alpha_5 LReDe_{it} + \alpha_6 mtb_{it} + \varepsilon_{it} \quad (2)$$

Where RepD is the reputation dummy variable with a value of 1 for those firms with a score in Fortune Magazine's reputation scores, and 0 otherwise, RD is the total number of risk words, Lage is the log of the number of years since creation, Lmc is the log of annual market capitalization, LReDe is the log of annual research and development expenditure, and mtb is the annual average of the daily market to book ratio. The Lagrange multiplier test is used to test the random effects model versus the pooling regression. The Hausman specification test is used to test the fixed effects model versus the random effects model. The variance inflation factor is tabulated to test the autocorrelation for pooling regression. The Wooldridge test is used to test the serial autocorrelation for panel data.

* Significant at 10% level
** Significant at 5% level.
*** Significant at 1% level.

| Variable | Pooled logistic | | Fixed effects logistic | | Random effects logistic | |
|---|---|---|---|---|---|---|
| RepD | Coef | P.value | Coef | P.value | Coef | P.value |
| RD | .00010* | 0.066 | .00083* | 0.089 | .00032* | 0.088 |
| Lage | .24039 | 0.146 | -9.29462 | 0.476 | .79830 | 0.270 |
| Lmc | .34341** | 0.039 | -.54249 | 0.774 | 1.03564 | 0.147 |
| LReDe | .73722* | 0.071 | -2.50329 | 0.315 | 1.20648 | 0.114 |
| mtb | .26607*** | 0.000 | 1.14770 | 0.215 | .77652* | 0.095 |
| Constant | -15.26049*** | 0.000 | | | -34.44942*** | 0.004 |

The dependent variable is a dummy variable. We use three logistic regressions to estimate this equation (pooled logistic, conditional fixed effects logistic and random effects logistic regressions). The results are presented in table 5. We find that risk reporting positively impacts company reputation for our three empirical models at a 10% level of significance. The negative impact of control variables no longer exists. The pooled logistic model suggests a positive and significant impact of firm value, research and development expenditure, and market to book ratio on the firm's reputation. The fixed effects logistic model displays insignificant impact of all control variables on reputation. However, the random effects logistic model suggests that market to book ratio has a significant and positive effect. In a

nutshell, the findings confirm the robustness of the positive impact of risk disclosure on firm reputation. But they do not confirm the negative effect of the controls on reputation.

## 7. Conclusion

In this paper, we examine the impact of risk reporting on company reputation. Multiple empirical models were used to explore this relationship (pooled OLS, fixed effects, random effect, and pooled logistic, conditional fixed effects logistic and random effects logistic models). We argue that risk reporting significantly and positively impacts company reputation. In addition, our findings indicate that this positive impact still exists for low-risk firms. However, risk disclosure does not have a significant effect on the firm's reputation for very high-risk firms. We found that our results are robust for alternative measurements of the reputation variable and for several regression models. This study has implications for theory and practice. First, we confirm that the impact of risk disclosure on reputation does not differ from the impact of total firm disclosure (voluntary and mandatory). Second, our study motivates the firms to disclose more risk information to promote their reputation. One limitation of this study concerns the reputation variable. Since Fortune Magazine is not specialized in the French market**,** only 33 French firms are listed in the magazine per year, which impacted the number of observations used in this study.

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