**The effect of risk disclosure on analyst following**

**Imen Derouiche**[[1]](#footnote-1)♣

Unité de recherche CREA, University of Luxembourg, Luxembourg

**Anke Muessig**

Unité de recherche CREA, University of Luxembourg, Luxembourg

**Véronique Weber**

Unité de recherche CREA, University of Luxembourg, Luxembourg

# **Abstract**

Prior research shows that financial analysts play an important information intermediary role in France. This study extends earlier research to examine the effect of risk disclosure on the number of analysts following listed firms. Using a unique dataset of French firms on the 120 SBF index over 2007−2015, the results show a positive and significant relation between risk disclosure and analyst following, suggesting that firms having greater risk disclosure attract more financial analysts. These findings provide empirical support to the argument that analysts incur lower costs of information gathering in firms with greater risk disclosure. The demand for analyst services is also more valuable in these firms, given their potentially high exposure to risks, implying greater analyst following. Overall, our results are in line with prior literature highlighting that analysts’ activities complement annual report disclosures and, generally, corporate disclosures.

*JEL classification*: G32; G34; M41

*Keywords*: Risk disclosure; Analyst following; Information asymmetry.

#  **1. Introduction**

Financial analysts rely on different sorts of information communicated by the firm, notably the annual report, to make their earnings forecasts and recommendations regarding the firms they follow (Hope, 2003a).[[2]](#footnote-2) There is a vast literature showing that the corporate information environment and, in particular, corporate disclosure have an impact on analyst following. Lehavy *et al.* (2011) and Sundgren *et al.* (2018) show that greater numbers of analysts follow firms with high-quality disclosures. Dhaliwal *et al.* (2012) and Gao *et al.* (2016) document increased analyst following after the initiation of corporate social responsibility reporting. Other studies provide evidence that the number of analysts following a firm is positively associated with overall voluntary disclosure (Hamrouni *et al.*, 2017), corporate governance disclosure (Yu, 2010), and voluntary political spending disclosure (Goh *et al.*, 2018), and the extent of note disclosure (Hope, 2003c).[[3]](#footnote-3)

Although the vast majority of these studies establish that financial analysts typically prefer more transparent firms, it is unclear whether they do so with respect to risk disclosure that is generally associated with negative information. To fill this gap, the present study examines the effect of risk disclosure on the number of analysts following a firm. We focus on sell-side analysts, that is, those who are employed by brokerage houses, research institutes, or investment banking firms and issue research reports including earnings forecasts and buy, hold, or sell stock recommendations.

Our focus on risk disclosure is of particular interest because the incentives for managers to voluntarily report about negative events/operations remain subject to many debates and research. Moreover, most risk information, such as the identification of firm-specific risks or on risk assessment, is difficult to obtain from sources other than the firm’s annual report. In a survey exploring the views of users and preparers of risk information, Abraham *et al.* (2012) document that risk disclosure provided by corporate managers is the most important source of information for analysts. In direct interviews with analysts, two-thirds of the interviewees answering whether risk factor statements are useful or not responded that they find the information on risk factors provided by firms to be useful and revealing new information.

In the present research, we argue that firms with greater risk disclosure attract more analysts because the supply and demand for analyst services increases with the level of such disclosure. Based on arguments derived from institutional theory, firms might want to build reputation notably by disclosing negative information likely to be more credible and trustworthy than other types of information. Signalling theory holds that expanded corporate voluntary disclosure, such as risk disclosure, can serve as a signal of reduced information asymmetry between managers and market participants. The likely implication of this is that analysts would incur lower costs of information gathering with high-risk disclosure firms, implying greater analyst following.

Additionally, demand for analyst services is expected to be more important for high-risk disclosure firms. Indeed, a firm’s potentially high exposure to risks would increase investors’ concern about the firm’s capacity to generate sufficient future cash flows (Kravet and Muslu, 2013), particularly since risky and uncertain environments are typically associated with increased agency problems between insiders and outsiders (Bhushan and Cho, 1996). Analysts’ activities would thus be more valuable when risk disclosure is greater, resulting in a larger analyst following.

The measurement of risk disclosure is based on a content analysis approach. Following several studies, including Abraham and [Shrives](https://scholar.google.fr/citations?user=i1iN_L0AAAAJ&hl=fr&oi=sra) (2014), Campbell *et al.* (2014), Dobler *et al.*, (2011) and Neri *et al.*, (2018), we focus on the risk factor section of the annual report and analyse the effect of negative and uncertain connotations of risk disclosure, that is, indicating uncertain or negative future outcomes for the firm. Unlike the 10-K filings of U.S. firms, which are highly structured, French annual reports are unstructured, which requires the manual extraction of risk factor sections, leading to the uniqueness of our dataset. We use different proxies for risk disclosure, namely, the number of risk words appearing from Kravet and Muslu’s (2013) keyword list, the number of sentences containing at least one risk word, the number of risk factors, and the number of total sentences in the risk factor section. These measures of risk disclosure quantity capture the effort that firms employ in identifying and describing the risks they are exposed to and can be valid proxies for the informativeness of such disclosures (Beretta and Bozzolan, 2004; Campbell *et al.,* 2014).

In France, listed firms are required to report their significant risks in their annual report in accordance with International Financial Reporting Standards (IFRS). Contrary to the U.S. risk reporting environment, where firms must file their annual report to the U.S. Securities and Exchange Commission (SEC) in a standardized (10-K) form, including a description of their risk factors (Item 1A), risk information provided by firms reporting under IFRS is not provided in a standardized form. According to the International Accounting Standards Board (IASB), a firm is required, under IFRS, to disclose its ‘principal risk exposures and changes in those risks, together with its plans and strategies for bearing or mitigating those risks, as well as disclosure of the effectiveness of its risk management strategies’ (IASB, 2010, p. 13). The IASB puts special emphasis on requiring firms to report their principal risks rather than listing all the possible risks they could face. Contrary to the SEC, the IASB does not provide a template for the risk factor section or for the annual report. In addition, it does not require firms to report their annual report in a specific format. In France, and in accordance with IFRS as well as with French Commercial Law, the board of directors is required to include in the management report a description of significant risks and uncertainties that the firm faces, as well as objectives and policies regarding risk management.[[4]](#footnote-4) It is also required that this management report be accompanied by the chairperson’s report on internal control and risk management procedures.[[5]](#footnote-5)

Although no specific format for risk reporting is regulatorily defined, most firms provide in practice a specific section in their annual report devoted to the main risks and uncertainties they are facing, following the release by the Autorités des Marchés Financiers (AMF) —the regulator of France’s financial markets—of the Recommendation of 29 October 2009 on risk factors that provides details on the minimum information to be reported in the ‘Risk Factors’ section of the annual report. [[6]](#footnote-6) This section is intended to identify events and operations that could significantly affect the accounts of the firm in the short to medium term and that largely depend on the nature of the entity’s businesses. In a nutshell, although French firms are required by law and regulation to report their significant risk factors, the absence of a standard legal and regulatory specific framework puts the content and the extent of risk reporting almost solely at management’s discretion, thus turning it into a (quasi-) voluntary disclosure*.*

This paper uses detailed risk disclosure and analyst following data from France. The sample covers 113 non-financial and non-utility listed firms on the SBF 120 index over the period 2007–2015. France provides an interesting laboratory for several reasons. First, the study of the French setting allows conclusion to be drawn on the determinants of analyst coverage in the cradle of the French civil law system. Prior evidence, such as Chang *et al.* (2001), shows that, compared to common law countries, analyst coverage is lower in civil law countries, in which corporate financial reporting is likely to be less transparent (Ball *et al.*, 2000). Second, as most of European countries, France is a bank-oriented economy which, contrary to market-oriented economies, provides little protection to minority investors and poor law enforcement (La Porta *et al.*, 1997). However, strong investor protection is one of the key goals of the SEC, explaining the strict regulations on risk reporting in the U.S. (Sarbanes-Oxley Act, 2002) compared to weakly regulated risk reporting of France. Third, French listed firms are characterized by a highly concentrated ownership structure and are often controlled by families (Boubaker and Labégorre, 2008). These specificities may lead to increased investors’ demand for analyst services. All these characteristics make France an interesting setting to investigate how risk disclosure shapes the behaviour of analysts and allow for conclusions beyond the U.S. and other European settings.

 Consistent with the prediction of an increased analyst following for firms with greater risk disclosure, we document a significant positive association between the four measurements of risk disclosure and the number of analysts who cover the firm, after controlling for other determinants of analyst following. We interpret this result as being consistent with the view that analysts are attracted by firms for which the costs of information gathering are low and the demand for analyst services is high, such as high-risk disclosure firms. Overall, our results are in line with prior literature highlighting that analysts’ activities complement annual reports disclosures and, generally, corporate disclosure.

The present study contributes to both the risk disclosure and analyst literatures. First, prior risk disclosure literature has primarily been from a shareholder perspective, focusing on the association between risk disclosure and investor behaviour as reflected in stock returns (Kravet and Muslu, 2013), stock informativeness (Tan *et al.*, 2017), stock liquidity (Neri *et al.*, 2018), and initial returns of initial public offerings (Wasiuzzaman *et al.*, 2018). Very few papers have adopted a different view, such as examining the effect of risk disclosure on audit fees (Yang *et al.*, 2018) or the impact of customers’ risk disclosure on suppliers’ investment efficiency (Chiu *et al.*, 2018). We complement this strand of literature by investigating for the first time how risk disclosure affects the decision of analysts to follow a firm. Thus, we are among the first to explore the behaviour of annual report users other than investors, namely, analysts.

Second, few prior studies have conducted a content analysis of the risk factors section outside the U.S. setting, that is, in environments in which the annual report is not structured and thus difficult to explore, such as in the U.K. (Abraham and [Shrives](https://scholar.google.fr/citations?user=i1iN_L0AAAAJ&hl=fr&oi=sra), 2014; Linsley and Shrives, 2006), Canada (Dobler *et al.*, 2011), Germany (Elshandidy *et al.*, 2015), Italy (Beretta and Bozzolan, 2004; Elshandidy and Neri, 2015), Finland (Miihkinen, 2012), and China (Neri *et al.*, 2018). By manually extracting the risk factor sections of the annual reports of French firms, we complement these prior studies with an approach combining manual and computer-aided content analysis in a European setting, that is, France. We obtain a unique dataset and, to the best of our knowledge, we are the first to systematically explore the risk factor section in French annual reports.

Third, we add to the literature on analysts as users of annual reports. Prior empirical work documents that specific components of the annual report are particularly useful for analysts, such as accounting policy disclosures (Hope, 2003b), corporate social responsibility reporting (Dhaliwal *et al.*, 2012; Gao *et al.*, 2016), components of voluntary disclosure that do not cover risk disclosure (Hamrouni *et al.*, 2017), voluntary political spending disclosures (Goh *et al.*, 2018), and note disclosure (Hope, 2003c). Unlike these studies, we focus on risk disclosure information regarding its effect on analyst following, which, as far as we know, has not yet been explored.[[7]](#footnote-7)

The remainder of the paper is organized as follows. Section 2 presents the theoretical background and develops the research hypothesis. Section 3 describes the data and variables. Section 4 reports the results of the main multivariate analysis as well as robustness checks. Section 5 addresses endogeneity issues. Section 6 concludes the paper.

1. **Theoretical background and hypothesis development**

This section presents the theoretical background of the present study (Section 2.1) and develops the research hypothesis (Section 2.2).

* 1. ***Theoretical background of risk disclosure***

Although a number of theories have been proposed for the analysis of risk disclosure (Elshandidy *et al.*, 2018), two could be particularly relevant in explaining the extent to which risk disclosure is useful for analysts, namely, institutional theory and signalling theory.

Institutional theory suggests that firms apply rules and incorporate norms to gain social acceptance (Oliver, 1991). Through extensive risk disclosure, firms are more inclined to comply with the value of the environment in which they evolve by providing it with a wide range of information on the uncertainties and risks to which they are exposed. Such uncertainty and risk disclosure information would be particularly useful for different stakeholders, including analysts, especially since this sort of negative information is difficult to obtain from sources other than annual reports. Institutional theory drives three forces that are likely to affect risk disclosure as a form of voluntary disclosure: regulative, mimetic, and normative pressure (Scott, 1995; Elshandidy *et al.,* 2015). Regulative pressure is inherent in the requirements, even when they comprise generic and vague terms, of the laws and regulations to report significant risk factors in annual reports. Firms can also mimic the risk disclosure behaviour of their peers to signal their alignment with industry standards (Abraham and Shrives, 2014). Normative pressure can also induce managers to reveal risk information voluntarily in response to the recommendations of different local and international regulatory bodies (Elshandidy *et al.*, 2015).

Signalling theory, as suggested by Spence (1973), holds that a voluntary disclosure environment sends a positive signal of reduced information asymmetry between a firm and market participants (e.g. Diamond and Verrecchia, 1991; Healy and Palepu, 2001). In particular, high-risk disclosure can signal managers’ unobservable efforts to identify and manage most of the risks faced by the firm via the observable amount of risk reporting in annual reports. Empirical work highlights the roles of mandatory risk disclosure (Miihkinen, 2012; Elshandidy and Neri, 2015) and of risk factor disclosure (Campbell *et al.*, 2014) in reducing information asymmetry. The signalling environment could, however, be affected by the way signals are interpreted by those who use them (Rynes *et al.*, 1991). Thus, expanded risk disclosure can be viewed either positively, as an indicator of less information asymmetry and a firm’s higher awareness and ability to manage the risks it is exposed to, or negatively, as a signal of higher exposure to risks and thus greater uncertainty in its future cash flows.

* 1. ***Hypothesis development***

Analysts are considered among the major users of information provided in annual reports (Schipper, 1991). The quantity of annual report disclosures is, for example, shown by Hope (2003a) to significantly affect the accuracy of analysts’ earnings forecasts. Indeed, as financial professionals, analysts play an important intermediary role, given their ability to analyse and interpret corporate disclosure when forecasting earnings (Boissin and Sentis, 2014; Sundgren *et al.*, 2018).

An analyst’s decision to follow a firm is based on the costs and benefits of doing so. The lower the costs of following a firm, the more attractive the firm to the analyst. These costs are essentially associated with the acquisition of information about new firms (Bae *et al.*, 2008). There is sound evidence that a firm providing more extensive risk disclosures suggests lower costs for analysts, giving them incentives to follow the firms. First, based on the above developments in the institutional theory framework, firms could acquire a good reputation by reporting their risks. Since reputation is valued in its own right, analysts could value the risk disclosure information of highly reputed firms.

Second, from the perspective of signalling theory, expanded risk disclosure can signal managers’ willingness to mitigate information asymmetry with market participants by providing them with both qualitative and quantitative risk information (Hope 2003a; Sundgren *et al.*, 2018). As users of corporate disclosure, analysts can benefit from reduced information asymmetry by incurring lower costs of information gathering while making more accurate forecasts. In this regard, Lang *et al.* (2004) find that analysts are more reticent to follow firms that have incentives to withhold information. Bushman *et al.* (2005) show a lower analyst following in environments of high information asymmetry driven by weak insider trading laws.

Third, the risk reporting in annual reports is carried out by management on the basis of, essentially, inside information and a multifaceted analysis of the firm environment as conducted by specialized corporate committees such as audit, risk, risk management, and corporate governance committees. This means that most of the risk disclosure information in annual reports has already been compiled and processed, which would translate into less time and effort put forth by analysts to engage in further information acquisition and processing procedures.

Fourth, analysts are perceived to play a monitoring role by regularly following the firm’s accounts and providing research reports to investors (Jensen and Meckling, 1976; Chen *et al.*, 2015; Zhang, 2018). As a form of voluntary disclosure, risk disclosure can increase the observability of managerial actions, thus allowing for closer monitoring of managerial actions by shareholders and other stakeholders. For example, Farag *et al.*, (2014) show that firms with greater number of risk factors have better governance. This implies lower monitoring costs for analysts in firms that already give different market participants the opportunity to monitor management through expanded voluntary disclosure. This is even more relevant when considering risk disclosure, given that bad news conveyed by such disclosure is inherently more credible and trustworthy than other types of information, thus contributing further to the reduction of agency costs (Linsley and Shrives, 2006; Miihkinen, 2012).

From another angle, risk disclosure typically reflects a firm’s exposure to risk and increases investors’ risk perception, suggesting that unknown contingencies and risks are communicated to the investors (Kravet and Muslu, 2013; Linciano *et al*., 2018; Bohnert *et al*., 2019). This would raise investors’ concerns about the firm’s capacity to generate sufficient future cash flows and thus ensure long-term sustainability (Abraham and Shrives, 2014). In this respect, Neri *et al.*, (2018) find that bad news is priced negatively by the market and, therefore, investors’ risk perception is increased and market liquidity is worsened by creating information asymmetry. Since analysts are perceived as a sort of seal of approval in risky and uncertain environments, the demand for analyst services is expected to be higher for firms with greater risk disclosure. For example, Barth *et al.* (2001) show that the number of analysts following a firm is higher if the firm has more intangible assets, because such assets are usually associated with inherent uncertainty, making analyst services more valuable.

Moreover, firms that are subject to numerous risks can involve greater agency problems with investors, requiring more analyst scrutiny to resolve these problems (Moyer *et al.*, 1989; Bhushan and Cho, 1996). Further, bad news that is voluntarily disclosed in annual reports, such as that contained in risk reporting, usually conveys vague and less formal information (Skinner, 1994). Indeed, managers are more reticent, intentionally or unintentionally, to provide precise and detailed information about highly risky projects because of the uncertainties of future cash flows inherent in these sorts of projects, as well as the risk that these managers would be penalized for not achieving their targeted results.[[8]](#footnote-8) In such an environment, analysts are expected to add more value in intermediating risk disclosure information to investors, using their expertise and professional experience, arguably increasing the demand for analyst services and, thereby, the analyst following (Bhushan, 1989; Zhang, 2018).

Based on all these arguments, we hypothesize that firms with greater risk disclosure are followed by greater numbers of analysts.

1. **Data and variables**

This section presents the sample selection procedure (Section 3.1), describes the variables (Section 3.2), and reports descriptive statistics and correlation analysis (Section 3.3).

* 1. ***Sample and data sources***

Our sample consists of French firms on the SBF 120 index over the period 2007−2015. Following prior studies, we exclude financial firms and utilities firms because of their specific regulations. We also discard observations that are missing data. We are left with a sample of 857 observations of 113 firms.

The number of analysts following a firm is obtained from the historical Institutional Broker Estimation System (I/B/E/S) international database. The risk factor sections are extracted manually from the firms’ annual reports, which are downloaded from the firms’ respective websites. The numbers of risk words, risk-related sentences, and total sentences are obtained by computer-aided content analysis and the numbers of risk factors are computed manually. All control variables are obtained from Thomson Reuters Datastream.

* 1. ***Regression variables***

In this section, we provide details on the measurement of the variables used in the main analysis. The Appendix presents the definitions and data sources for all the variables used for the empirical tests.

* + 1. *Analyst following*

Our dependent variable, *Analyst*, is the number of analysts following a firm. It is measured as the number of earnings per share estimates issued by analysts per year for a particular firm.

* + 1. *Risk disclosure*

Following the relevant risk disclosure literature, our risk disclosure measures are based on a textual analysis of the risk factor section of firms’ annual reports (e.g., Linsley and Shrives, 2006; Dobler *et al.*, 2011; Campbell *et al.*, 2014). In this analysis, we do not consider any risk management policy description or any risk coverage/insurance coverage sections. The goal is to include only the pure description of the risks, since we are interested in the potential impact of information on events/operations with uncertain or negative future outcomes for the firm, consistent with previous studies (e.g. Linsley and [Shrives](https://scholar.google.fr/citations?user=i1iN_L0AAAAJ&hl=fr&oi=sra), 2006).

It is worth noting that our sample consists of the largest French listed firms in which it is common to communicate and to report both in French and in English, given that their target audience is public and international and they usually cross-list in the U.S. or/and in other international markets. Zreik and Louhichi (2017) highlight a high level of congruence between the French and the English versions of the annual reports of French listed firms belonging to the SBF 120 index. Thus, we validate the use of the English version of annual reports for this study, and we are ensured that this will not lead to potential bias in our conclusions.

The first step of our analysis consists in downloading annuals reports from the firms’ websites. Next, we manually extract textual risk disclosures that generally appear to be a risk factor section of the annual report. Lastly, we analyse, both manually and with computer assistance, the files obtained and construct four variables for risk disclosure. Higher values of these variables are associated with greater firm transparency and more informative risk disclosure.

First, the variable *Risk\_words* is the number of risk words, measured as the natural logarithm of the number of risk words in the risk factor section. Consistent with our focus on risk disclosures with negative or uncertain connotations, we opt for the following risk word list, provided by Kravet and Muslu (2013): *can/cannot, could, may, might, risk\*, uncertain\*, likely to, subject to, potential\*, vary\*/varies, depend\*, expos\*, fluctuat\*, possibl\*, susceptible, affect, influenc\*,* and *hedg*\*. The asterisk implies that suffixes are allowed. This choice is, in addition, consistent with our reading of 20 randomly selected risk factor sections extracted from the annual reports of the sampled firms.[[9]](#footnote-9)

Second, the variable *Risk\_sentences* is the number of sentences containing at least one risk word from the above-mentioned list, measured as the natural logarithm of the number of risk-related sentences in the risk factor section. A certain consensus in the risk disclosure literature has emerged regarding the advantages of using sentences as coding units instead of words (Linsley and Shrives, 2006; Abraham and Cox, 2007; Dobler *et al.*, 2011; Kravet and Muslu, 2013; Abraham and Shrives, 2014). Indeed, in a text, one sentence is generally intended to convey one idea, which can avoid counting an item of risk information more than once if a sentence contains numerous risk words (Kravet and Muslu, 2013). In our counting process, a table or headline is treated as one sentence.

Third, the variable *Risk\_factors* is the number of risk factors, measured as the natural logarithm of the number of risk factors in the risk description section. Risk factors provided by managers in the annual report are shown to meaningfully convey to investors a firm’s exposure to risks (Beretta and Bozzolan, 2004; Abraham and Shrives, 2014; Campbell *et al.*, 2014). We consider all types of risk factors, including those specific to the firm or to the industry in which the firm operates, as well as financial and general non-financial risk factors. Our analysis of risk factors is not limited to simply counting risk factors as highlighted in the headlines of the risk factor section; we examine each subsection in depth to identify all the risks that are reported by the firm.

Fourth, the variable *Total\_sentences* is the number of total sentences, measured as the natural logarithm of the number of total sentences in the risk factor section. This variable is the most direct measure of the length of risk disclosure could also gauge the quality of such disclosure. Indeed, the mainstream literature on voluntary disclosure suggests that the quantity of the information can be used as a sound proxy for its quality (Beretta and Bozzolan, 2004; Campbell *et al.*, 2014).

* + 1. *Control variables*

In our main analysis, we control for a set of variables that are shown in the literature to influence analyst following. The variable *Ownership*, measured as the voting rights of the largest shareholders, is introduced to control for the possibility that a firm’s analyst following is influenced by the power of dominant shareholders, following Hope (2003c), Lang *et al.* (2004) and Boubaker and Labégorre (2008). Consistent with these studies, greater control by dominant shareholders is expected to be negatively associated with the analyst following. Firm size (*Size*), measured as the natural logarithm of total sales, is used as a control because analysts are more willing to follow larger firms (e.g. Bhushan, 1989; O’Brien and Bhushan, 1990; Lang and Lundholm, 1996). The variable *Beta* is included to control for the systematic risk of a firm’s stock returns. It is measured by regressing the daily returns of the respective firm on daily market returns, based on the SBF 120 index, over the previous year. We also control for the variable *Earnings surprise,* since prior literature shows a significant influence of earnings quality on analysts’ decision to follow a firm (Lang and Lundholm, 1996). It is measured as the absolute value of the difference between current and one-year lagged earnings per share, scaled by the stock price at the beginning of the fiscal year. We include the variable *Return STD*, measured as the annualized volatility of daily stock returns over the last three years, to account for the volatility of a firm’s stock price. Indeed, the high costs inherent in the greater uncertainty of firms with higher stock return volatility can deter analysts from following them (Lehavy *et al.*, 2011), whereas issuing recommendations about those firms would be more valuable to investors, thus attracting more analysts (Bhushan, 1989; Jiang and Kim, 2016). The variable *Profitability*, measured as the return on invested capital, is introduced in the model because analysts shy away from unprofitable firms. We include the market-to-book ratio, *Market-to-Book*, to control for analysts’ potentially greater interest in high-growth firms (Barth *et al.*, 2001; Lehavy *et al.*, 2011). A dummy variable, *XLIST,* is included when the firm cross-lists in the United States (Boubaker and Labégorre, 2008). We also include the dummy variable *Issuance* to indicate if a firm issued capital during the financial year, since such a firm is expected to be followed by more analysts. We further introduce the control variable *Intangible,* measured as the percentage of intangible assets to total assets, because intangible assets are typically associated with high uncertainty, making analyst services more valuable to investors (Barth *et al.*, 2001; Lehavy *et al.*, 2011).

* + 1. *Descriptive statistics and correlation*

Table 1 reports summary statistics for the dependent variable, the four risk disclosure measures, and all the control variables employed in the main regression analysis. The dependent variable has a mean of 16.31 and a median of 16; on average, firms are followed by 16 analysts. The table shows the raw text variables used to compute the risk disclosure measures. On average, the extracted texts and, thus, the description of the firm’s exposure to risks and uncertainties cover 252.34 sentences. In these extracted portions of the annual report, firms employ, on average, 145.57 risk keywords. We find, on average, 136.53 sentences that contain at least one risk keyword, which means that around 54% of all sentences are related to risk. What is striking is that there seem to be large differences between firms and across years. The minimum number of sentences of the extracted texts is 17 and the maximum is 878. Similar large ranges can be observed for the number of risk words and the number of risk-related sentences.

The size of the sample firms is varying between 0.0612 million euros (first percentile) and 90.440 million euros (99th percentile) with a relatively high average of 12.2608, which is consistent with the nature of our sample (i.e. firms in the SBF120 index). The mean beta, a proxy for systematic risk, is 0.82 in our sample. The average percentage of voting rights of the largest shareholder is 34%. The mean earnings surprise is 0.0030, indicating that the average firm does not exhibit high earnings volatility. The average annualized standard deviation of daily stock returns over three years ranges from 0.1770 to 0.7090, suggesting a certain degree of heterogeneity in the volatility of stocks across firms and time. During the sample period, the mean value of returns on invested capital, a proxy for firm profitability, is 0.078, which means that, on average, the firms in our sample are profitable. The book value exceeds the market value of the average firm in our sample; the mean market-to-book value is 0.8520. More than half of the firms in our sample are cross-listed in the United States and more than 75% issued capital over the sample period. The percentage of intangible assets to total assets ranges from 0.36% to 63.75%, with an average of 28.4%.

*[Please insert Table 1 about here]*

Table 2 describes mean risk disclosure by industry and by year. Panel A describes risk disclosure across industries. The results show that, for the four risk disclosure variables, firms from the textile and trade industries as well as the leisure industry have the lowest values. In the transportation and utilities industries, firms seem to report more extensively about their risk exposure. Firms in the petroleum industry exhibit the highest average number of risk factors. This is consistent with the notion that firms from industries with severe environmental impacts have more pressure to engage in extensive voluntary disclosure (Mallin and Ow-Yong, 2012), including that of risks. Panel B presents the average level of risk disclosure over the sample. The results show an increase in the amount of risk information disclosed in the French annual reports, which is consistent with the upward trend in risk disclosure worldwide (Campbell and Slack, 2008).

 *[Please insert Table 2 about here]*

Table 3 reports the Pearson correlations. The four proxies for risk disclosure are positively and significantly correlated with the number of analysts following firms. This is a first indicator that risk disclosure is an important factor in analysts’ decision to follow a firm. In addition, the analyst following is significantly correlated with most of our control variables.

*[Please insert Table 3 about here]*

1. **Empirical evidence**

This section presents the results of regressions of the effect of risk disclosure on analyst following (Section 4.1) and of the role of corporate opacity in such effect (Section 4.2) as well as the results of robustness checks (Section 4.3).

* 1. ***Main evidence: Effect of risk disclosure on analyst following***

To test the effect of risk disclosure on the number of analysts following a firm, we estimate the following model specification:

*Analysti,t+1 = β0 + β1 RiskDisclosure measurei,t + β2 Ownershipi,t + β3 Sizei,t + β4 Betai,t + β5 Earnings surprisei,t + β6 Return STDi,t + β7 Profitabilityi,t + β8 Market-to-Booki,t + β9 XLISTi,t + β10 Issuancei,t + β11 Intangiblei,t + β12 Year Dummies + β13 Industry Dummies + εi,t* (1)

where all the variables are described in the Appendix. All the control variables are lagged by one period and winsorized at the 1% level in both tails. The model includes industry and year fixed effects to control for inter-industry and time variations in analyst following. We employ an ordinary least squares (OLS) regression with standard errors that are Huber–White heteroskedastic robust and clustered by firm.

Table 4 reports the results of the effects of different proxies for risk disclosure on analyst following. In specification (1) in Table 4, we note that risk disclosure as proxied by the variable *Risk-sentences* is positively associated with the number of analysts that follow the firm the subsequent year. This association is also highly statistically significant at the 1% confidence level and suggests that firms with higher levels of risk disclosure are more likely to be followed by a greater number of analysts. In specification (2), we use the variable *Risk\_words* as the measurement of firm risk disclosure and find that the results are similar to those for specification (1). Specifications (3) and (4) reveal the same picture, showing that the coefficient on *Total\_sentences* and *Risk\_factors* loads positively and statistically significantly at the 1% confidence level.[[10]](#footnote-10)

To assess the economic significance of our results, we examine the impact of a change in each of the four proxies of risk disclosure on firms’ analyst following the subsequent year while holding other variables constant. A one standard deviation increase in *Risk\_sentences* implies an increase of 1.6 in the number of analysts following the firm. This value translates into a relative increase of 9.81% over the average analyst following (considering the mean value of *Analyst* of 16.3; see Table 1).[[11]](#footnote-11) Similarly, a one standard deviation increase in *Risk\_words*, *Total\_sentences*, and *Risk\_factors* implies an increase of, respectively, 9.22%, 9.72%, and 8.65% in the average analyst following.

Our findings support our hypothesis predicting a positive association between risk disclosure and the number of analysts following the firm, which means that firms with greater risk disclosure attract more analysts. This result can be attributed to lower costs of information gathering for analysts covering firms that already report extensively on their risks in their annual reports, especially since this type of information is difficult to obtain from other sources. Our findings are also consistent with greater investor demand for analyst services in those firms subject to greater uncertainties because of their exposure to multiple risks. We thus find support for the evidence of prior studies (e.g., Lang and Lundholm, 1996; Hope, 2003a; Lehavy *et al.*, 2011; Dhaliwal *et al.*, 2012) suggesting that analysts are among the most important users of annual reports, in particular, risk disclosure which is very difficult information to obtain from other sources.

From an institutional perspective, a number of arguments supporting the positive effect of risk disclosure on analyst following particularly hold for French firms. Interestingly, given that legal and regulatory risk disclosure requirements in France are low, firms could differentiate themselves and gain in reputation by providing higher risk disclosure, which typically attracts more analysts. Moreover, in civil law countries and bank-oriented economies, such as in France, investors face greater challenges inherent in high corporate opacity and low levels of investor protection (La Porta *et al.*, 1997), which renders analyst services more valuable, particularly in firms exposed to higher risks. Hence, analysts would benefit more from following these firms, which would explain why the increased risk disclosure of French firms results in higher analyst following. In relation to this view, the monitoring role of analysts seems to be particularly valuable to minority investors in the French legal environment, which is characterized by a highly concentrated corporate ownership and the dominance of controlling shareholders having substantial control over the firm (Boubaker and Labégorre, 2008).

The coefficients of the control variables are, overall, consistent with the literature. As expected, we find that analysts prefer covering large firms because of the potentially greater transparency of larger groups. Analysts are also found to be attracted to firms showing higher risk and to those with a greater proportion of intangibles, since investor demand for analyst services is expectedly higher for riskier firms. Analyst are, however, more reticent to follow firms with high return volatility and those whose shareholders wield substantial control power, since higher costs would be incurred in doing so. The results also document greater analyst preferences for healthier firms, that is, more profitable firms and firms with more growth opportunities. Further, analysts tend to be more interested in firms that cross-list their shares in the United States compared to those that do not. We find, however, that analyst following is not significantly affected by earnings forecast error or by whether a firm issued capital during the financial year.

*[Please insert Table 4 about here]*

* 1. ***Additional analysis: Effect of corporate opacity***

In our main analysis, analyst following is shown to be higher in firms with greater risk disclosure, probably because of lower costs of information gathering in these firms. To reinforce this view, we conduct additional analysis examining whether the positive effect of risk disclosure on analyst following is more pronounced for more opaque firms. Indeed, the value of analyst services typically increases in firms where investors face greater challenges inherent in increased uncertainty and information asymmetry. Consequently, analyst output is expected to be more valuable for more opaque firms (Loh and Stulz, 2018). Thus, analysts can add more value to investors of these firms while profiting from a competitive advantage of covering them (Boubaker and Labégorre, 2008). Accordingly, the complementary information role of analysts is expected to be more relevant for more opaque firms, implying a greater effect of risk disclosure on analyst coverage in these firms. To test this conjecture, we split our sample into Low opacity or High opacity groups, depending on whether the bid–ask spread at the end of the fiscal year is below or above the median value of distribution. Indeed, a high (low) bid–ask spread results from low (high) liquidity, which translates into high (low) information asymmetry and thus into high (low) corporate opacity. The results of estimating our baseline model across the two groups of firms are reported in Table 5. They show that the coefficient of *Risk\_sentences* is higher in the High opacity group compared to that in the Low opacity group. This implies that the positive association between risk disclosure and analyst following is more pronounced in more opaque firms, indicating that corporate opacity increases analysts’ likelihood to follow firms with higher risk disclosure. This result suggests that analysts benefit more from collecting information among these firms, which provides additional evidence that analysts are more attracted by high-risk disclosure firms in which they will incur lower costs of information gathering.

*[Please insert Table 5 about here]*

* 1. ***Robustness checks***

In this section, we conduct robustness checks using alternative measures for risk disclosure (Section 4.3.1) and alternative statistical techniques (Section 4.3.2).

* + 1. *Alternative risk disclosure variables*

Table 6 reports the results of robustness tests using aggregate and refined measures of risk disclosure. First, we compute a risk disclosure index from the four variables used in our main analysis – that is, *Risk\_sentences*, *Risk-words*, *Total\_sentences,* and *Risk factors* – using principal component factor analysis.[[12]](#footnote-12) This analysis generates one common significant factor with an eigenvalue of 3.267 (i.e., greater than one), that explains 81.69% of the total variance. We include this new measure of risk disclosure, *Risk\_index*, in specification (1) and find again that the corresponding coefficient is positive and statistically significant at the 1% confidence level. This supports our main finding that firms with greater risk disclosure attract more analysts.

Second, we construct four refinements of *Risk\_factors* variable by creating four categories of risk factors identified in the risk factor section, namely, general risks (specification (2)), firm-specific risks (specification (3)), industry-specific risks (specification (4)), and financial risks (specification (5)). Firm-specific risks are risk factors that are specific to the firm operations and processes, such as reliance on one client or supplier, risk related to the obsolescence of machines and equipment, or liability risk. However, industry-specific risks are risk factors to which all/ the majority of companies belonging to a same industry are exposed, such as those related to the economic or geopolitical environment.[[13]](#footnote-13) Financial risks are risks related to the firm’s exposure to financial and capital markets (e.g., credit risk, currency risk, liquidity risk). General risks are all risk factors that cannot be classified in the previous three categories. The results from specifications (2) to (5) show a positive and highly statistically significant coefficient for the risk disclosure variables, indicating that analysts are attracted by the different types of risks that the firm faces, particularly when it comes to financial risks, as shown by the largest magnitude for the coefficient of financial risks.

Third, we construct the variable *Risk\_factor coverage*, considering the four risk factor categories above and using the Herfindahl index to take into account the weight of each risk factor category (specification (6)). The measure of this variable is as follows:

*Risk\_factor coverage = [(1/H)/4]* (2)

where *H* is the Herfindahl index of concentration across risk factor categories, calculated as $H=\sum\_{i=1}^{n}P\_{i}^{2}$, and *P* is the number of risk factors by category divided by the total number of risk factors. The main results remain materially unchanged.

Fourth, we measure risk disclosure using the ratio of the number of risk-related sentences in the risk factor section to the number of total sentences in the risk factor section (specification (7)). We find that our conclusions are not affected by this alternative analysis.

 *[Please insert Table 6 about here]*

* + 1. *Alternative statistical techniques*

Table 7 presents the results of robustness checks to alternative statistical approaches. First, we perform a dynamic generalized method of moments (GMM) estimation that contains one-year lagged dependent variable and a set of lagged endogenous variables as instruments (specification (1)). The results show that the risk disclosure effect on analyst following is strongly positive at the 1% statistical level, thus reinforcing the prediction of the research hypothesis. Our GMM model is well specified and uses valid instruments, as shown by the *p*-values of the second-order serial correlation and of the Hansen test of overidentification, 0.841 and 0.644, respectively. Second, we estimate our model using the Fama–MacBeth procedure that estimates yearly cross-sectional regressions (specification (2)). The coefficient of *Risk\_sentences* continues to be positive and highly statistically significant. Third, we perform a weighted least squares (WLS) regression to account for the unequal distribution of sample firms across industries (specification (3)). We obtain materially similar results to those previously reported. Fourth, we use a random effects model that allows for between-firm variability and accounts for heterogeneity across studies and find qualitatively similar results (specification (4)). Fifth, given that our dependent variable, *Analyst*, is a nonnegative integer, we use count data regressions instead of linear regressions. In particular, we employ a negative binomial model (specification (5)) and a Poisson model (specification (6)). The results from both models are consistent with those of the main analysis. Sixth, we construct a dummy variable for analyst following that equals one if the variable *Analyst* is above the median and zero otherwise and conduct a logit regression (specification (7)). The resulting coefficient on *Risk-sentences* is again positive and highly significant at the 1% level, consistent with our main finding that more analysts follow a firm with greater risk disclosure.[[14]](#footnote-14)

*[Please insert Table 7 about here]*

1. **Endogeneity**

In this section, we address the endogeneity issue to take into consideration the potential reverse causality problem, that is, that high analyst following could, on average, lead to
greater risk disclosure. Indeed, the scrutiny of greater numbers of analysts would put more pressure on managers to increase corporate disclosure, including risk disclosure. Moreover, the potential presence of omitted variables that is likely to affect both risk disclosure and analyst following could bias our results. We deal with these issues using propensity score marching technique (Section 5.1), instrumental variable approach (Section 5.2), and a quasi-natural experiment (Section 5.3).

* 1. ***Propensity score matching***

Panel A of Table 8 presents the results of propensity score matching. As suggested by Dehejia and Wahba ([2002](https://onlinelibrary-wiley-com.proxy.bnl.lu/doi/full/10.1111/fima.12148#fima12148-bib-0026)), this technique allows for the identification of a control sample of firms with low risk disclosure (below the median value) but similar characteristics as firms with high risk disclosure (above the median value). For each firm with high risk disclosure, we select the closest firm with low risk disclosure in terms of its probability of high risk disclosure, that is, its propensity score. We match on industry and year because firm characteristics are likely a function of industry and time. Such an approach allows one to control for observable differences in characteristics between the groups with low and high risk disclosure.[[15]](#footnote-15)

In a first step, a probit model is used to calculate the propensity scores of the treated and matched groups of firms. In this model, the dependent variable is a dummy measure of risk disclosure that takes the value of one if the variable *Risk\_sentences* is above the median and zero otherwise;the independent variables are *Leverage*, *Size*, *Beta*, *Return STD*, and *Market-to-book*, as well as industry and year dummy variables (specification (1)). These independent variables are selected based on previous studies on the determinants of risk disclosure. The propensity score matching procedure results in a treatment sample of 428 firm–years equally distributed between the groups of firms with low and high risk disclosure. The probit regression results yield a positive and statistically significant coefficient for *Leverage*, *Size,* and *Beta*, indicating that firms can disclose more about their risks when they are more leveraged, larger, and riskier. These results are consistent with the view that firms that are exposed to higher litigation and political costs tend to be more transparent.

In a second step, we estimate our baseline model over the treatment sample and find that the results are similar to our earlier findings (specification (2)). Notably, the coefficient of *Risk\_sentences* loads positively and statistically significantly at the 10% confidence level, which is consistent with the view that greater risk disclosure is associated with a larger analyst following. Moreover, the estimated coefficients of the control variables exhibit similar signs and statistical significance as in the main analysis.

* 1. ***Instrumental variable approach***

Panel B of Table 8 presents the results of two-stage instrumental variable estimation. In specification (1), we estimate the first-stage of the instrumental variable model*.* For a given firm, the instrument for *Risk\_sentences* is measured as the average value of this variable in the sample of all other studied firms in the same industry group. This instrument captures the fact that firms with similar activities are more inclined to adopt a similar risk disclosure policy. We use the instrument along with the same exogenous variables as those used in the just-above probit model to explain risk disclosure. We find that the instrument enters with a positive coefficient which is statistically significant at the 1% statistical level. Moreover, all explanatory variables, except for *market-to-book*, exhibit statistically significant coefficients, suggesting their relevance to risk disclosure policy. We also report a partial *F*-statistic and *R*-squared of excluded instruments of, respectively, 53.5267 and 11.36%, meaning that we do not have a weak-instrument problem (Stock and Yogo, 2005). In specification (2), the second-stage estimation uses the fitted value of *Risk\_sentences* from the first-stage regression as variable of interest. The coefficient on this fitted value is found to be positive and statistically significant at the 1% level, reinforcing our main finding that increased risk disclosure is associated with greater analyst following.

* 1. ***Quasi-natural experiment***

To further alleviate potential endogeneity concerns, we examine a quasi-natural experiment, that is, an event that affected the extent of risk disclosure but not analyst coverage. Specifically, we examine the reaction of analyst coverage to the exogenous event of releasing the AMF Recommendation of 29 October 2009 on risk factors. Despite the absence of empirical evidence on the positive effect of such a recommendation on risk reporting, one should expect that listed firms in France, in particular the largest ones, comply with the recommendations of the regulatory bodies, notably by increasing their risk disclosure. Therefore, the release of such a recommendation by the AMF would offer an interesting setting for capturing major changes in corporate risk disclosure practices and may represent real‐side shocks that exogenously shift the scope of risk reporting. We evaluate how analyst coverage reacts to the event of releasing the regulatory recommendation on the risk factor section of the annual report in 2009 using a difference-in-difference approach. In particular, we replicate our baseline regressions using a dummy variable that takes the value one for the period after 2009, that is, from 2010 to 2015 period, and zero otherwise. This method allows us to compare the responses of a treatment group (i.e., observations over the period 2010–2015, that is, firms having a good risk disclosure policy) to those of a control group (i.e., observations over the period 2007–2009, that is, firms having a poor risk disclosure policy). The results of the difference-in-difference analysis examining the impact of AMF’s recommendation release shock on analyst following are reported in Panel C of Table 8. They show that firms are followed by more analysts after the release of AMF’s recommendation on the risk factor section of the annual report, compared to the period before the release. This effect is economically significant, given that the number of analysts following a firm after AMF’s recommendation increases by more than four. Overall, this finding is consistent with our main hypothesis predicting that more risk disclosure gives an incentive to a greater number of analysts to follow the firm.

 *[Please insert Table 8 about here]*

1. **Conclusion**

Research provides evidence of a correlation between corporate disclosure and analyst following (e.g. Lang and Lundholm, 1996; Hope, 2003a; Lehavy *et al.*, 2011). Using a sample of non-financial and non-utilities firms on the 120 SBF index over the period 2007−2015, this study extends this line of research to shed light on the effect of risk disclosure in the firm annual report on the number of analysts following the firm. We focus on the risk factor section of the annual report because of our interest in uncertain and negative connotation disclosures. Unlike the 10-K filings of U.S. firms, which are highly structured, French annual reports are unstructured, which requires manual extraction of the risk factor sections, leading to the uniqueness of our dataset.

This study documents several interesting findings. The results from our main analysis show a positive and significant association between risk disclosure and analyst following, suggesting that firms providing greater risk disclosure attract more analysts. These findings are consistent with the notion that analysts can incur lower costs of information gathering in firms with greater risk disclosure, which gives them sufficient incentive to follow these firms. Moreover, investor demand for analyst services presumably increases with risk disclosure as a remedy for a firm’s exposure to multiple risks, leading to greater analyst following.

The evidence presented in this research expands our understanding of the role of analysts as major users of annual reports and pins down the importance of analysts’ activities in complementing information conveyed in firm annual reports and, generally, in corporate disclosures. This makes our findings interesting to researchers, analysts, managers, and regulators. A natural extension of this research that we propose for future study is an exploration of the extent to which risk disclosure affects the accuracy of analysts’ forecasts.

**References**

Abraham, S., & Cox, P. (2007). Analysing the determinants of narrative risk information in UK FTSE 100 annual reports. *The British Accounting Review*, *39*(3), 227-248.

Abraham, S., Marston, C., & Darby, P. (2012). *Risk reporting: Clarity, relevance and location*. Institute of Chartered Accountants of Scotland. Edinburgh.

Abraham, S., & Shrives, P. J. (2014). Improving the relevance of risk factor disclosure in corporate annual reports. *The British accounting review, 46(1)*, 91-107.

Bae, K. H., Stulz, R. M., & Tan, H. (2008). Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. *Journal of Financial Economics*, *88*(3), 581-606.

Ball, R., Kothari, S. P., & Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics*, *29*(1), 1-51.

Barth, M. E., Kasznik, R., & McNichols, M. F. (2001). Analyst coverage and intangible assets. *Journal of accounting research*, *39*(1), 1-34.

Beretta, S., & Bozzolan, S. (2004). A framework for the analysis of firm risk communication. *The International Journal of Accounting, 39(3)*, 265-288.

Bohnert, A., Gatzert, N., Hoyt, R. E., & Lechner, P. (2019). The drivers and value of enterprise risk management: evidence from ERM ratings. *The European Journal of Finance*, *25*(3), 234-255.

Boissin, R., & Sentis, P. (2014). Long-run performance of IPOs and the role of financial analysts: some French evidence. *The European Journal of Finance*, *20*(2), 125-149.

Boubaker, S., & Labégorre, F. (2008). Ownership structure, corporate governance and analyst following: A study of French listed firms. *Journal of Banking & Finance*, *32*(6), 961-976.

Bhushan, R. (1989). Firm characteristics and analyst following. *Journal of Accounting and Economics*, *11*(2), 255-274.

Bhushan, R., & Cho, J. Y. (1996). Acquisitions and the information environment of firms. *Financial Review*, *31*(1), 105-125.

Bushman, R. M., Piotroski, J. D., & Smith, A. J. (2005). Insider trading restrictions and analysts' incentives to follow firms. *The Journal of Finance*, *60*(1), 35-66.

Campbell, J. Y. (1996). Understanding risk and return. *Journal of Political economy*, *104*(2), 298-345.

Campbell, J. L., Chen, H., Dhaliwal, D. S., Lu, H. M., & Steele, L. B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies*, *19*(1), 396-455.

Campbell, D., & Slack, R. (2008). Corporate “philanthropy strategy” and “strategic philanthropy” some insights from voluntary disclosures in annual reports. *Business & Society*, *47*(2), 187-212.

Chang, J. J., Khanna, T., & Palepu, K. (2001). Analyst activity around the world. Harvard Business School working paper series no. 01-061.

Chen, T., Harford, J., & Lin, C. (2015). Do analysts matter for governance? Evidence from natural experiments. *Journal of Financial Economics*, *115*(2), 383-410.

Chiu, T. T., Kim, J. B., & Wang, Z. (2018). Customers’ risk factor disclosures and suppliers’ investment efficiency. *Contemporary Accounting Research*.

Dehejia, R. H., & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and statistics*, *84*(1), 151-161.

Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., & Yang, Y. G. (2012). Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review*, *87*(3), 723-759.

Diamond, D. W., & Verrecchia, R. E. (1991). Disclosure, liquidity, and the cost of capital. *The journal of Finance*, *46*(4), 1325-1359.

Dobler, M., Lajili, K., & Zéghal, D. (2011). Attributes of corporate risk disclosure: an international investigation in the manufacturing sector. *Journal of International Accounting Research, 10(2)*, 1-22.

Elshandidy, T., Fraser, I., & Hussainey, K. (2015). What drives mandatory and voluntary risk reporting variations across Germany, UK and US?. *The British Accounting Review*, *47*(4), 376-394.

Elshandidy, T., & Neri, L. (2015). Corporate governance, risk disclosure practices, and market liquidity: comparative evidence from the UK and Italy. *Corporate Governance: An International Review, 23(4),* 331-356.

Elshandidy, T., Shrives, P. J., Bamber, M., & Abraham, S. (2018). Risk reporting: A review of the literature and implications for future research. *Journal of Accounting Literature*, *40*, 54-82.

Farag, H., Mallin, C., & Ow‐Yong, K. (2014). Governance, ownership structure, and performance of entrepreneurial IPOs in AIM companies. *Corporate Governance: An International Review*, *22*(2), 100-115.

Gao, F., Dong, Y., Ni, C., & Fu, R. (2016). Determinants and economic consequences of non-financial disclosure quality. *European Accounting Review*, *25*(2), 287-317.

Goh, L., Liu, X., & Tsang, A. (2018). Voluntary disclosure of corporate political spending. *Journal of Corporate Finance*.

Hamrouni, A., Benkraiem, R., & Karmani, M. (2017). Voluntary information disclosure and sell-side analyst coverage intensity. *Review of Accounting and Finance*, *16*(2), 260-280.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of accounting and economics*, *31*(1), 405-440.

Hope, O. K. (2003)a. Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of accounting research, 41(2),* 235-272.

Hope, O. K. (2003)b. Accounting policy disclosures and analysts' forecasts. *Contemporary Accounting Research*, *20*(2), 295-321.

Hope, O. K. (2003)c. Analyst following and the influence of disclosure components, IPOs and ownership concentration. *Asia-Pacific Journal of Accounting & Economics*, *10*(2), 117-141.

IASB. (2010). Management Commentary, Practice Statement. London: International Accounting Standards Board.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, *3*(4), 305-360.

Jiang, G. J., & Kim, W. (2016). Evaluating analysts' value: evidence from recommendation revisions around stock price jumps. *The European Journal of Finance*, 22(3), 167-194.

Kravet, T., & Muslu, V. (2013). Textual risk disclosures and investors’ risk perceptions. *Review of Accounting Studies, 18(4)*, 1088-1122.

Lang, M. H., & Lundholm, R. J. (1996). Corporate disclosure policy and analyst behavior. *Accounting review*, 467-492.

Lang, M. H., Lins, K. V. and Miller, D. P. (2004), Concentrated Control, Analyst Following, and Valuation: Do Analysts Matter Most When Investors Are Protected Least?. Journal of Accounting Research, 42: 589-623.

La Porta, R., Lopez‐de‐Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The Journal of Finance*, *52*(3), 1131-1150.

Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, *86*(3), 1087-1115.

Linciano, N., Lucarelli, C., Gentile, M., & Soccorso, P. (2018). How financial information disclosure affects risk perception. Evidence from Italian investors’ behaviour. *The European Journal of Finance*, *24*(15), 1311-1332.

Linsley, P. M., & Shrives, P. J. (2006). Risk reporting: A study of risk disclosures in the annual reports of UK companies. *The British Accounting Review, 38(4),* 387-404.

Li, F. (2006). Do stock market investors understand the risk sentiment of corporate annual reports? Working Paper, *University of Michigan*.

Loh, R. K., & Stulz, R. M. (2018). Is sell‐side research more valuable in bad times? *The Journal of Finance*, *73*(3), 959-1013.

Loughran, T., & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10‐Ks. *The Journal of Finance*, *66*(1), 35-65.

Mallin, C., & Ow-Yong, K. (2012). Factors influencing corporate governance disclosures: Evidence from Alternative Investment Market (AIM) companies in the UK. *The European Journal of Finance*, 18(6), 515-533

Miihkinen, A. (2012). What drives quality of firm risk disclosure?: the impact of a national disclosure standard and reporting incentives under IFRS. *The International Journal of Accounting, 47(4)*, 437-468.

Morgan, S. L., & Harding, D. J. (2006). Matching estimators of causal effects: Prospects and pitfalls in theory and practice. *Sociological methods & research*, *35*(1), 3-60.

Moyer, R. C., Chatfield, R. E., & Sisneros, P. M. (1989). Security analyst monitoring activity: Agency costs and information demands. *Journal of Financial and Quantitative Analysis*, *24*(4), 503-512.

Neri, L., Elshandidy, T., & Guo, Y. (2018). Determinants and impacts of risk disclosure quality: evidence from China. *Journal of Applied Accounting Research*, *19*(4), 518-536.

O'Brien, P. C., & Bhushan, R. (1990). Analyst following and institutional ownership. *Journal of Accounting Research*, 55-76.

Oliver, C. (1991). Strategic responses to institutional processes. *Academy of management review*, *16*(1), 145-179.

Rynes, S. L., Bretz Jr, R. D., & Gerhart, B. (1991). The importance of recruitment in job choice: A different way of looking. *Personnel psychology*, *44*(3), 487-521.

Sarbanes-Oxley Act of 2002 (2002). The Public Company Accounting Reform and Investor Protection Act, Pub. L. no. 107-204. Online at http:www.whitehouse.govinfocus corporateresponsibility

Schipper, K. (1991). Analysts' forecasts. *Accounting horizons*, *5*(4), 105.

Scott, W. R. (1995). Institutions and organizations. Foundations for organizational science. *London: A Sage Publication Series*.

Skinner, D. J. (1994). Why firms voluntarily disclose bad news. *Journal of accounting research*, *32*(1), 38-60.

Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, *87*(3), 355-374.

Stock, J. H., & Yogo, M. (2005). Testing for weak instruments in linear IV regression. Chapter 5 in Identification and Inference in Econometric Models: Essays in Honor of Thomas J.Rothenberg, edited by DWK Andrews and JH Stock.

Sundgren, S., Mäki, J., & Somoza-López, A. (2018). Analyst coverage, market liquidity and disclosure quality: a study of fair-value disclosures by European real estate companies under IAS 40 and IFRS 13. *The International Journal of Accounting*, *53*(1), 54-75.

Tan, H., Wang, S. & Wwelker, M. (2011). Analyst Following and Forecast Accuracy After Mandated IFRS Adoptions. *Journal of Accounting Research, 49(5) ,1307-1357.*

Tan, Y., Zeng, C.C., Elshandidy, T. (2017). Risk disclosures, international orientation, and share price informativeness: Evidence from China. *Journal of International Accounting, Auditing and Taxation, 29(1), 81-102.*

Tsai, F. T., Lu, H. M., & Hung, M. W. (2016). The impact of news articles and corporate disclosure on credit risk valuation. *Journal of Banking & Finance*, *68*, 100-116.

Yang, R., Yu, Y., Liu, M., & Wu, K. (2018). Corporate Risk Disclosure and Audit Fee: A Text Mining Approach. *European Accounting Review*, *27*(3), 583-594.

Yu, M. (2010). Analyst forecast properties, analyst following and governance disclosures: A global perspective. *Journal of International Accounting, Auditing and Taxation*, *19*(1), 1-15.

Wasiuzzaman, S., Yong, F. L. K., Sundarasen, S. D. D., & Othman, N. S. (2018). Impact of disclosure of risk factors on the initial returns of initial public offerings (IPOs). *Accounting Research Journal*, *31*(1), 46-62.

Zhang, R. (2018). Product market competition, competitive strategy, and analyst coverage. *Review of Quantitative Finance and Accounting*, *50*(1), 239-260.

Zreik, O., & Louhichi, W. (2017). Risk sentiment and firms’ liquidity in the French market. *Research in International Business and Finance*, *39*(1), 809-823.

Appendix. Variable definitions and data sources

|  |  |  |
| --- | --- | --- |
| Variable | Definition | Data sources |
| Dependent variable |  |
| *Analyst* | The number of analysts following the firm, based on the number of earnings per share estimates issued by analysts per year. | I/B/E/S |
| Risk disclosure variables |
| *Risk\_words* | The natural logarithm of the number of risk words in the risk factor section of the annual report. The risk words are from Kravet and Muslu’s (2013) risk word list: *can/cannot, could, may, might, risk\*, uncertain\*, likely to, subject to, potential\*, vary\*/varies, depend\*, expos\*, fluctuat\*, possibl\*, susceptible, affect, influenc\*,* and *hedg*\*. The asterisk implies that suffixes are allowed. | Computer-aided content analysis based on annual reports |
| *Risk\_sentences* | The natural logarithm of the number of sentences in the risk factor section of the annual report containing at least one risk word appearing in Kravet and Muslu’s (2013) risk word list.  | As above |
| *Total\_sentences* | The natural logarithm of the number of total sentences in the risk factor section of the annual report. | As above |
| *Ind\_ average\_risk* | The average of *Risk\_sentences* for the all other firms in the same industry group. |  |
| *Risk\_factors* | The natural logarithm of the number of risk factors reported in the risk factor section of the annual report. | Manual content analysis based on annual reports |
| *General risks* | The natural logarithm of the number of risk factors that are non-financial and not specific to the firm or the industry to which it belongs. | As above |
| *Firm specific risks* | The natural logarithm of the number of risk factors that are specific to firm operations and processes. | As above |
| *Industry specific risks* | The natural logarithm of the number of risk factors to which all or the majority of companies belonging to a same industry are exposed. | As above |
| *Financial risks* | The natural logarithm of the number of risk factors resulting from exposure to financial and capital markets. | As above |
| *Risk disclosure index* | The common factor extracted from the main risk disclosure variables (i.e. *Risk\_sentences*, *Risk\_words*, *Total\_sentences*, and *Risk\_factors*) using principal component analysis. | Authors’ calculation |
| *Risk\_factor coverage* | Risk factor coverage considering the four risk factor categories identified above and using the Herfindahl index *Risk\_factor coverage = [(1/H)/4],* where *H* is the Herfindahl index of concentration across risk factor categories, calculated $H=\sum\_{i=1}^{n}P\_{i}^{2}$, and *P* is the number of risk factors by category divided by the total number of risk factors. | As above |
| *Risk\_sentence\_ratio* | The ratio of the number of risk-related sentences in the risk factor section to the number of total sentences in the risk factor section. | As above |
| Control variables |
| *Ownership*  | Voting rights of the largest shareholder. | Datastream data |
| *Size* | Firm size, measured as the natural logarithm of total sales. | Authors’ calculations based on Datastream data |
| *Beta* | The firm systematic beta, measured as daily returns of the respective firm on daily market returns, based on the SBF 120 index, over the previous year. | As above |
| *Earnings surprise* | The absolute value of the difference between current and one-year lagged earnings per share, scaled by the stock price at the beginning of the fiscal year. | As above |
| *Return STD*  | The volatility of returns, measured as the annualized volatility of daily stock returns over the last three years, to account for the volatility of a firm’s stock price. | As above |
| *Profitability* | The firm’s profitability, measured as the return on invested capital. | As above |
| *Market-to-Book* | The firm’s growth opportunities, measured as the market-to-book ratio. | As above |
| *XLIST* | A dummy variable that equals one when the firm cross-lists in the United States, using the American Depositary Receipt (ADR) program, and zero otherwise. | As above |
| *Issuance* | A dummy variable that equals one if a firm issued capital during the financial year and zero otherwise.  | As above |
| *Intangible* | Intangible assets, measured as the percentage of intangible assets to total assets. | As above |
| *Leverage* | The ratio of total debt to total assets. | As above |

Table 1. Descriptive statistics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | Mean | STD | 1st percentile | 25th percentile | Median | 75th percentile | 99th percentile |
| *Analyst*  |  16.3090 |  7.8080 |  1.0000 |  10.0000 |  16.0000 |  21.0000 |  37.0000 |
| *Risk\_sentences* | 136.526 |  77.479 | 10.000 |  80.000 | 123.000 | 174.000 | 441.000 |
| *Risk\_words* | 145.565 |  80.054 |  9.000 |  89.000 | 132.000 | 180.000 | 473.000 |
| *Risk\_factors* |  34.317 |  22.556 |  0.000 |  17.000 |  31.000 |  45.000 | 110.000 |
| *Total\_sentences* | 252.337 | 142.761 | 17.000 | 157.000 | 227.000 | 315.000 | 878.000 |
| *Ownership* |  0.3434 |  0.2478 |  0.0000 |  0.1158 |  0.2995 |  0.5446 |  0.9587 |
| *Size (millions of euros)* |  12.2608 |  20.4711 |  0.06120 |  1.4000 |  3.9000 |  14.0000 |  90.440 |
| *Beta* |  0.8200 |  0.3280 |  0.0880 |  0.5770 |  0.8174 |  1.0470 |  1.5800 |
| *Earnings surprise* |  0.0030 |  0.1370 |  -0.6100 |  -0.0160 |  0.0023 |  0.0150 |  0.7460 |
| *Return STD* |  0.3310 |  0.1040 |  0.1770 |  0.2490 |  0.3113 |  0.3950 |  0.7090 |
| *Profitability* |  0.0780 |  0.0900 |  -0.3140 |  0.0420 |  0.0726 |  0.1120 |  0.4970 |
| *Market-to-book* |  0.8520 |  0.8840 |  0.0690 |  0.3440 |  0.6108 |  1.0260 |  6.2730 |
| *XLIST* |  0.5250 |  0.5000 |  0.0000 |  0.0000 |  1.0000 |  1.0000 |  1.0000 |
| *Issuance* |  0.8670 |  0.3400 |  0.0000 |  1.0000 |  1.0000 |  1.0000 |  1.0000 |
| *Intangible* |  0.2840 |  0.1660 |  0.0036 |  0.1620 |  0.2765 |  0.3980 |  0.6375 |
|  |
| This table reports summary statistics of the variables used in the main analysis. See the Appendix for the variable definitions. Raw values are given for the risk disclosure variables. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. |

Table 2. Risk disclosure by industry and by year

|  |
| --- |
|  |
|  |  | *N*  | *Risk\_sentences* | *Risk\_words* | *Risk\_factors* | *Total\_sentences* |
| Panel A: Risk disclosure measures by industry |
| Industry | Two-digitSIC codes |  |  |  |  |  |
| Petroleum | 13, 29 | 32 | 155.7500 | 170.8438 | 54.8438 | 332.4063 |
| Consumer durables | 25, 30, 36, 37, 50, 55, 57 | 178 | 140.5899 | 153.6517 | 35.0618 | 248.0393 |
| Basic industry | 10, 12, 14, 24, 26, 28, 33 | 72 | 163.9583 | 163.9444 | 45.7778 | 289.6667 |
| Food and tobacco | 1, 2, 9, 20, 21, 54 | 48 | 128.4792 | 141.5000 | 34.7500 | 230.0208 |
| Construction | 15, 16, 17, 32, 52 | 44 | 152.2500 | 171.2955 | 33.9318 | 315.4091 |
| Capital goods | 34, 35, 38 | 62 | 118.7258 | 128.9677 | 25.3387 | 219.5000 |
| Transportation | 40, 41, 42, 44, 45, 47 | 36 | 194.6389 | 196.7500 | 32.4167 | 336.7222 |
| Utilities | 46, 48 | 100 | 178.6400 | 181.6800 | 43.0500 | 334.4000 |
| Textiles and trade | 22, 23, 31, 51, 53, 56, 59 | 62 | 95.0484 | 106.0645 | 17.0806 | 179.7097 |
| Services | 72, 73, 75, 76, 80, 82, 87, 89 | 178 | 109.2472 | 117.6742 | 31.7697 | 210.7697 |
| Leisure | 27, 58, 70, 78, 79 | 45 | 105.6000 | 111.7778 | 26.6667 | 174.6667 |
| Panel B: Risk disclosure measures by year |
| Year |  |  |  |  |  |  |
| 2007 |  | 86 | 94.942 | 97.291 | 24.942 | 174.221 |
| 2008 |  | 88 | 107.398 | 113.034 | 28.034 | 197.000 |
| 2009 |  | 90 | 123.567 | 130.411 | 30.844 | 234.433 |
| 2010 |  | 95 | 128.832 | 137.874 | 32.747 | 245.516 |
| 2011 |  | 92 | 137.065 | 145.891 | 34.359 | 252.967 |
| 2012 |  | 95 | 146.695 | 158.884 | 36.389 | 273.842 |
| 2013 |  | 103 | 154.573 | 165.175 | 38.350 | 285.922 |
| 2014 |  | 105 | 160.190 | 170.762 | 39.771 | 291.943 |
| 2015 |  | 103 | 162.524 | 176.126 | 40.456 | 292.417 |
| This table describes the mean risk disclosure by industry (Panel A) and by year (Panel B). See the Appendix for the variable definitions. Raw values are given for the risk disclosure variables. *N* is the number of observations. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. The term SIC stands for Standard Industrial Classification.  |

Table 3. Correlations

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| (1) *Analyst* | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (2) *Risk\_sentences* | 0.252\*\*\* | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (3) *Risk\_words* | 0.267\*\*\* | 0.986\*\*\* | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| (4) *Risk factors* | 0.214\*\*\* | 0.618\*\*\* | 0.602\*\*\* | 1 |  |  |  |  |  |  |  |  |  |  |  |
| (5) *Total\_sentences* | 0.220\*\*\* | 0.963\*\*\* | 0.943\*\*\* | 0.611\*\*\* | 1 |  |  |  |  |  |  |  |  |  |  |
| (6) *Ownership* | -0.237\*\*\* | 0.0258 | 0.00102 | 0.0444 | 0.00706 | 1 |  |  |  |  |  |  |  |  |  |
| (7) *Size* | 0.662\*\*\* | 0.0700\* | 0.105\*\* | 0.0470 | 0.0314 | -0.164\*\*\* | 1 |  |  |  |  |  |  |  |  |
| (8) *Beta* | 0.297\*\*\* | 0.225\*\*\* | 0.228\*\*\* | 0.264\*\*\* | 0.130\*\*\* | -0.289\*\*\* | 0.367\*\*\* | 1 |  |  |  |  |  |  |  |
| (9) *Earnings surprise* | 0.00477 | 0.00496 | 0.00956 | -0.00542 | 0.0230 | 0.0209 | -0.00686 | 0.00204 | 1 |  |  |  |  |  |  |
| (10) *Return STD* | -0.161\*\*\* | 0.114\*\*\* | 0.0990\*\* | 0.152\*\*\* | 0.0400 | -0.118\*\*\* | -0.112\*\* | 0.477\*\*\* | 0.0252 | 1 |  |  |  |  |  |
| (11) *Profitability* | 0.131\*\*\* | -0.131\*\*\* | -0.134\*\*\* | -0.148\*\*\* | -0.0444 | 0.0107 | -0.0640 | -0.169\*\*\* | 0.155\*\*\* | -0.236\*\*\* | 1 |  |  |  |  |
| (12) *Market-to-book* | 0.0150 | -0.121\*\*\* | -0.121\*\*\* | -0.142\*\*\* | -0.0527 | 0.0955\*\* | -0.329\*\*\* | -0.255\*\*\* | 0.00206 | -0.185\*\*\* | 0.358\*\*\* | 1 |  |  |  |
| (13) *XLIST* | 0.477\*\*\* | 0.269\*\*\* | 0.288\*\*\* | 0.253\*\*\* | 0.116\*\*\* | -0.250\*\*\* | 0.488\*\*\* | 0.251\*\*\* | 0.00310 | -0.0467 | -0.0939\*\* | -0.0913\*\* | 1 |  |  |
| (14) *Issuance* | -0.0257 | 0.00211 | 0.00995 | -0.0448 | 0.0732\* | -0.120\*\*\* | 0.0587 | 0.0440 | -0.00428 | 0.109\*\* | -0.111\*\* | -0.171\*\*\* | 0.0133 | 1 |  |
| (15) *Intangible* | 0.161\*\*\* | -0.0428 | -0.0435 | -0.0846\* | 0.00773 | -0.0542 | 0.0523 | -0.0919\*\* | 0.0235 | -0.203\*\*\* | 0.0308 | -0.0592 | -0.0189 | -0.0162 | 1 |
| This table reports the Pearson correlation coefficients for all the variables in our main regressions. All the variables, except for *Analyst*, are lagged by one year. See the Appendix for variable definitions. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively |

Table 4. Main analysis: Risk disclosure and analyst following

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | (1) | (2) | (3) | (4) |
| *Risk\_sentences* | 2.5631\*\*\* |  |  |  |
|  | (0.5852) |  |  |  |
| *Risk\_words* |  | 2.3594\*\*\* |  |  |
|  |  | (0.5804) |  |  |
| *Risk\_factors* |  |  | 1.6402\*\*\* |  |
|  |  |  | (0.3979) |  |
| *Total\_sentences* |  |  |  | 2.6161\*\*\* |
|  |  |  |  | (0.6501) |
| *Ownership* | -4.0620\*\* | -3.7841\*\* | -4.1682\*\*\* | -3.7668\*\* |
|  | (1.6005) | (1.6282) | (1.5708) | (1.5243) |
| *Size* | 7.2667\*\*\* | 7.1656\*\*\* | 7.3513\*\*\* | 6.9674\*\*\* |
|  | (0.8594) | (0.8725) | (0.8597) | (0.9730) |
| *Beta* | 4.4478\*\*\* | 4.5742\*\*\* | 4.2139\*\*\* | 4.9286\*\*\* |
|  | (1.3302) | (1.3577) | (1.3409) | (1.6126) |
| *Earnings surprise* | 0.0499 | -0.0472 | 0.1134 | 0.0065 |
|  | (0.9276) | (0.9165) | (0.9254) | (0.9045) |
| *Return STD* | -14.3354\*\*\* | -14.1256\*\*\* | -14.2730\*\*\* | -13.9226\*\*\* |
|  | (4.3357) | (4.3539) | (4.3240) | (4.4599) |
| *Profitability* | 8.6439\*\* | 8.8239\*\* | 8.8821\*\* | 8.4160\*\* |
|  | (3.4511) | (3.4969) | (3.4875) | (3.3683) |
| *Market-to-book* | 2.3471\*\*\* | 2.3301\*\*\* | 2.4144\*\*\* | 2.2201\*\*\* |
|  | (0.4548) | (0.4511) | (0.4758) | (0.4494) |
| *XLIST* | 1.6024\*\* | 1.6567\*\* | 1.6100\*\* | 2.0499\*\* |
|  | (0.7507) | (0.7610) | (0.7624) | (0.8137) |
| *Issuance* | -0.0371 | -0.0751 | 0.2075 | -0.2843 |
|  | (1.2462) | (1.2404) | (1.2865) | (1.1752) |
| *Intangible* | 7.1768\*\*\* | 7.2967\*\*\* | 7.7405\*\*\* | 7.7034\*\*\* |
|  | (2.1310) | (2.1936) | (2.1329) | (2.4903) |
| *Intercept* | -0.3202 | -0.7047 | -2.7036 | 5.1969\* |
|  | (3.6637) | (3.8066) | (4.2589) | (2.8794) |
| *Year dummies* | Yes | Yes | Yes | Yes |
| *Industry dummies* | Yes | Yes | Yes | Yes |
| Adjusted *R*² | 0.681 | 0.677 | 0.679 | 0.676 |
| This table reports the results from OLS regressions of risk disclosure on analyst following. The dependent variable, *Analyst*, is the number of analysts following the firm. All independent variables are lagged by one year. See the Appendix for variable definitions. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. Year and industry dummies following Campbell’s (1996) classification are included in all the regressions. The coefficient standard errors are in parentheses beneath coefficient estimates. Standard errors are Huber–White heteroskedastic robust and clustered by firm. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.  |

Table 5. Additional analysis: Effect of corporate opacity

|  |  |  |
| --- | --- | --- |
|  | Low opacity | High opacity |
| Variable | (1) | (2) |
| *Risk\_sentences* | 2.8594\*\*\* | 4.6264\*\*\* |
|  | (0.5766) | (0.9470) |
| *Ownership* | -0.9926 | -7.6277\*\*\* |
|  | (2.0033) | (2.3221) |
| *Size* | 7.9388\*\*\* | 10.6120\*\*\* |
|  | (1.0830) | (1.5530) |
| *Beta* | 3.1896\* | 3.5347\*\* |
|  | (1.7246) | (1.5897) |
| *Earnings surprise* | -1.8172 | 1.4440 |
|  | (1.6858) | (0.9517) |
| *Return STD* | -12.0578\*\* | -8.0640 |
|  | (5.0091) | (4.8315) |
| *Profitability* | 4.7273 | 5.0761 |
|  | (3.7413) | (5.4790) |
| *Market-to-book* | 1.8036\*\*\* | 6.2178\*\*\* |
|  | (0.3260) | (1.0876) |
| *XLIST* | 1.4207 | 1.7911\*\* |
|  | (0.9048) | (0.8217) |
| *Issuance* | 0.0526 | 0.9499 |
|  | (1.1269) | (1.1508) |
| *Intangible* | 3.3084 | 4.1402 |
|  | (3.1524) | (2.8563) |
| *Intercept* | -1.3786 | -15.2725\*\* |
|  | (3.9994) | (5.8325) |
| *Year dummies* | Yes | Yes |
| *Industry dummies* | Yes | Yes |
| Sample size | 431 | 425 |
| Adjusted *R*² | 0.593 | 0.660 |
| This table reports the results from OLS regressions of risk disclosure on analyst following across Low opacity and High opacity groups. Low (High) opacity group consists of firms having the bid–ask spread at the end of the fiscal year below (above) the median value of distribution. The dependent variable, *Analyst*, is the number of analysts following the firm. All independent variables are lagged by one year. See the Appendix for variable definitions. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. Year and industry dummies following Campbell’s (1996) classification are included in all the regressions. The coefficient standard errors are in parentheses beneath coefficient estimates. Standard errors are Huber–White heteroskedastic robust and clustered by firm. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively |

Table 6. Robustness checks: Alternative measures of risk disclosure

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Risk\_index*(1) | *General risks*(2) | *Firm-specific risks* (3) | *Industry-specific risks* (4) | *Financial risks* (5) | *Risk\_factor coverage* (6) | *Risk\_sentences\_**ratio**(7)* |
| *Risk disclosure measure* | 1.5014\*\*\* | 1.1912\*\*\* | 0.9407\*\*\* | 1.3145\*\*\* | 2.2532\*\*\* | 6.5054\*\*\* | 9.5697\*\* |
|  | (0.3694) | (0.3882) | (0.3218) | (0.2557) | (0.7270) | (1.4398) | (4.3414) |
| *Ownership* | -3.7841\*\* | -3.7999\*\* | -3.3792\*\* | -3.0519\*\* | -3.0384\* | -2.8150\* | -4.0447\*\* |
|  | (1.6282) | (1.6556) | (1.4968) | (1.5019) | (1.5849) | (1.4627) | (1.6663) |
| *Size* | 7.1656\*\*\* | 6.9610\*\*\* | 7.0124\*\*\* | 6.9102\*\*\* | 6.9476\*\*\* | 6.6384\*\*\* | 6.3649\*\*\* |
|  | (0.8725) | (0.9582) | (0.9805) | (0.9384) | (0.9082) | (0.9054) | (0.9177) |
| *Beta* | 4.5742\*\*\* | 5.2707\*\*\* | 5.0529\*\*\* | 5.2287\*\*\* | 5.0142\*\*\* | 4.9426\*\*\* | 5.4568\*\*\* |
|  | (1.3577) | (1.5969) | (1.5936) | (1.4517) | (1.4271) | (1.3903) | (1.3942) |
| *Earnings surprise* | -0.0472 | 0.1286 | 0.1267 | 0.1876 | -0.0038 | 0.0288 | -0.2810 |
|  | (0.9165) | (0.9247) | (0.9179) | (0.8911) | (0.9435) | (0.8848) | (1.0118) |
| *Return STD* | -14.1256\*\*\* | -14.8963\*\*\* | -13.5497\*\*\* | -13.4554\*\*\* | -13.4762\*\*\* | -13.6542\*\*\* | -11.1614\*\* |
|  | (4.3539) | (4.6608) | (4.7335) | (4.5199) | (4.7300) | (4.4382) | (5.0080) |
| *Profitability* | 8.8239\*\* | 7.6465\*\* | 8.7458\*\* | 8.2132\*\* | 8.7791\*\* | 8.2838\*\* | 7.6917\*\* |
|  | (3.4969) | (3.5173) | (3.5635) | (3.2090) | (3.4268) | (3.2026) | (3.6737) |
| *Market-to-book* | 2.3301\*\*\* | 2.2291\*\*\* | 2.2386\*\*\* | 2.1980\*\*\* | 2.2782\*\*\* | 2.0682\*\*\* | 2.2281\*\*\* |
|  | (0.4511) | (0.4402) | (0.4439) | (0.4352) | (0.4556) | (0.4799) | (0.4706) |
| *XLIST* | 1.6567\*\* | 2.1737\*\*\* | 2.1743\*\*\* | 2.0186\*\* | 2.2390\*\*\* | 2.0690\*\*\* | 2.4073\*\*\* |
|  | (0.7610) | (0.8061) | (0.8245) | (0.7711) | (0.7975) | (0.7511) | (0.9037) |
| *Issuance* | -0.0751 | -0.4824 | -0.1928 | -0.1864 | -0.0651 | -0.4910 | -0.7274 |
|  | (1.2404) | (1.1468) | (1.2601) | (1.1738) | (1.2353) | (1.1795) | (1.2069) |
| *Intangible* | 7.2967\*\*\* | 7.8283\*\*\* | 7.9261\*\*\* | 8.0178\*\*\* | 8.0967\*\*\* | 7.2833\*\*\* | 7.0166\*\*\* |
|  | (2.1936) | (2.5474) | (2.5285) | (2.3762) | (2.3469) | (2.4168) | (2.4080) |
| *Intercept* | 11.5978\*\*\* | 9.1257\*\*\* | 8.2132\*\*\* | 7.3128\*\* | 5.2711\* | 6.3008\*\* | 5.7120 |
|  | (2.7028) | (2.9140) | (2.8140) | (2.8770) | (3.1514) | (3.1314) | (3.5637) |
| *Year dummies* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Industry dummies* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted *R*² | 0.677 | 0.669 | 0.664 | 0.677 | 0.664 | 0.674 | 0.619 |
| This table reports the results of robustness checks of the effect of risk disclosure on analyst following using alternative measures for risk disclosure. The dependent variable, *Analyst*, is the number of analysts following the firm. All independent variables are lagged by one year. See the Appendix for variable definitions. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. Year and industry dummies following Campbell’s (1996) classification are included in all the regressions. Coefficient standard errors are in parentheses beneath coefficient estimates. Standard errors are Huber–White heteroskedastic robust and clustered by firm. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. |

Table 7. Robustness checks: Alternative statistical techniques

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | GMM | Fama–MacBeth | WLS | Random effect | Negative binomial | Poisson | Logit |
| Variable | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| *Risk\_sentences* | 1.5069\*\*\* | 3.0474\*\*\* | 4.0445\*\*\* | 2.2949\*\*\* | 0.1882\*\*\* | 0.1714\*\*\* | 1.3869\*\*\* |
|  | (0.4296) | (0.2039) | (0.2767) | (0.3678) | (0.0196) | (0.0191) | (0.5002) |
| *Ownership* | -4.3748\*\* | -3.8931\*\*\* | -3.4583\*\*\* | -3.4336\*\*\* | -0.2243\*\*\* | -0.1923\*\*\* | -1.4039 |
|  | (2.2300) | (0.5282) | (0.6565) | (1.2032) | (0.0479) | (0.0501) | (0.9967) |
| *Size* | 5.5759\*\*\* | 7.3312\*\*\* | 8.3636\*\*\* | 7.4824\*\*\* | 0.4712\*\*\* | 0.4616\*\*\* | 3.2932\*\*\* |
|  | (0.7387) | (0.3629) | (0.2928) | (0.5938) | (0.0253) | (0.0291) | (0.6256) |
| *Beta* | 0.5152 | 4.6973\*\*\* | 5.4590\*\*\* | 1.4134\*\* | 0.3810\*\*\* | 0.3705\*\*\* | 2.6674\*\*\* |
|  | (0.5671) | (0.7843) | (0.5881) | (0.5596) | (0.0471) | (0.0585) | (0.5149) |
| *Earnings surprise* | 0.2940 | -1.1103 | 0.5351 | 0.4223 | -0.0010 | -0.0059 | -0.3963 |
|  | (0.4745) | (1.7607) | (0.7744) | (0.7409) | (0.0784) | (0.0868) | (0.5028) |
| *Return STD* | -0.1374 | -16.6367\*\* | -13.8044\*\*\* | -6.7982\*\*\* | -1.2345\*\*\* | -1.0047\*\*\* | -7.9563\*\*\* |
|  | (2.2682) | (5.1667) | (2.1032) | (1.9812) | (0.1662) | (0.2163) | (1.7181) |
| *Profitability* | 2.9658\* | 9.4488\*\*\* | -3.5981\*\* | 2.2309 | 0.7589\*\*\* | 0.8009\*\*\* | 5.0354\*\*\* |
|  | (1.7562) | (1.4327) | (1.6471) | (1.7068) | (0.1385) | (0.1568) | (1.8598) |
| *Market-to-book* | 1.8360\*\*\* | 2.2989\*\*\* | 5.0559\*\*\* | 1.4459\*\*\* | 0.1353\*\*\* | 0.1353\*\*\* | 1.0263\*\*\* |
|  | (0.2386) | (0.3068) | (0.3742) | (0.2648) | (0.0144) | (0.0164) | (0.3111) |
| *XLIST* | -0.6268 | 1.5637\*\*\* | 0.9853\*\*\* | 0.5550 | 0.0893\*\*\* | 0.1006\*\*\* | 0.7803\* |
|  | (0.7723) | (0.3248) | (0.3536) | (0.3941) | (0.0265) | (0.0262) | (0.4294) |
| *Issuance* | 0.7654 | -0.5961\*\* | 3.0893\*\*\* | 0.9298\*\* | 0.1471\*\*\* | -0.0284 | -0.0176 |
|  | (1.1138) | (0.1853) | (0.5659) | (0.4649) | (0.0470) | (0.0322) | (0.6378) |
| *Intangible* | 14.2749\*\*\* | 5.7068\*\*\* | 1.9533\*\*\* | 1.5016\*\*\* | 0.2046\*\*\* | 0.4075\*\*\* | 1.3513 |
|  | (3.6074) | (1.0646) | (0.6202) | (0.5131) | (0.0501) | (0.0649) | (1.1612) |
| *Lag\_Analyst* | 0.3531\*\*\* |  |  |  |  |  |  |
|  | (0.0726) |  |  |  |  |  |  |
| *Constant* | -1.3633 | 0.3807 | -8.6982\*\*\* | 4.0350 | 1.5150\*\*\* | 1.5267\*\*\* | -8.4867\*\*\* |
|  | (2.9794) | (1.3768) | (1.4351) | (2.7108) | (0.1158) | (0.1272) | (2.6326) |
| *Year dummies* | Yes | No | Yes | Yes | Yes | Yes | Yes |
| *Industry dummies* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted *R*² (pseudo *R*² ) {avg-*R*²} [overall *R*² ] | AR(1) = 0.000AR(2) = 0.841Hansen = 0.644 | {0.67} | 0.8184 | [0.6494] | (0.1513) | (0.3088) | (0.7124) |
| This table reports the results of robustness checks of the effect of risk disclosure on analyst following using alternative statistical approaches. In specifications (1) to (6), the dependent variable is *Analyst*, computed as the number of analysts following the firm. In specification (5), the dependent variable is a *dummy measure of analyst following that equals one if the variable Analyst is above the median and zero otherwise. Lag\_Analyst* is one-year lagged value of *Analyst.* All independent variables are lagged by one year. See the Appendix for variable definitions. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. Year and industry dummies following Campbell’s (1996) classification are included in all the regressions, except for specification (2), which does not include year dummies. Coefficient standard errors are in parentheses beneath coefficient estimates. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. |

Table 8. Endogeneity

|  |  |  |
| --- | --- | --- |
| Panel A: Propensity score matching estimation | Panel B: Instrumental variable estimation | Panel C: The quasi-natural experiment |
| Variable | Probit(1) | Propensity score matched sample (N=428) (2) | Variable | First-stage regression(1) | Second-stage regression(2) | Variable | Diff-in-diff estimation |
| *Risk\_sentences* |  | 1.4375\* | *Risk\_sentences (fitted)* |  | 5.8789\*\*\* | *Shock* | 4.5641\*\*\* |
|  |  | (0.7910) |  |  | (0.8993) |  | (0.8252) |
|  |  |  | *Ind\_ average\_risk* | 1.0282\*\*\* |  |  |  |
|  |  |  |  |  (0.1006) |  |  |  |
| *Leverage* | 0.4356\*\*\*  |  | *Leverage* | 0.1326\*\*\* |  |  |  |
|  | (0.1098) |  |  | (0.0379) |  |  |  |
| *Ownership* | 0.3915\*  | -7.8018\*\*\* | *Ownership* | 0.3298\*\*\* | -5.0378\*\*\* | *Ownership* | -3.0801\* |
|  | (0.2312)  | (1.1455) |  | (0.0783) | (0.8080) |  | (1.6153) |
| *Size* | -0.1365  | 7.7175\*\*\* | *Size* | -0.0843\*\* | 7.8362\*\*\* | *Size* | 7.0291\*\*\* |
|  | (0.1148)  | (0.5574) |  | (0.0399) | (0.3984) |  | (0.9526) |
| *Beta* | 0.6990\*\*\*  | 0.3815 | *Beta* | 0.4353\*\*\* | 2.3007\*\*\* | *Beta* | 5.4043\*\*\* |
|  | (0.1736)  | (1.0233) |  | (0.0630) | (0.8016) |  | (1.4813) |
| *Earnings surprise* |  | -0.2014 | *Earnings surprise* |  | -0.4191 | *Earnings surprise* | 0.0906 |
|  |  | (1.5303) |  |  | (1.2794) |  | (0.9217) |
| *Return STD* |  | -12.9427\*\*\* | *Return STD* |  | -16.1666\*\*\* | *Return STD* | -13.2689\*\*\* |
|  |  | (2.9993) |  |  | (2.5918) |  | (4.8891) |
| *Profitability* |  | 7.6469\*\*\* | *Profitability* |  | 7.7946\*\*\* | *Profitability* | 9.0428\*\* |
|  |  | (2.5160) |  |  | (2.1456) |  | (3.6345) |
| *Market-to-book* | 0.07147  | 2.5158\*\*\* | *Market-to-book* | -0.0214 | 2.3762\*\*\* | *Market-to-book* | 2.2513\*\*\* |
|  | (0.0632)  | (0.3334) |  | (0.0231) | (0.2333) |  | (0.4390) |
| *XLIST* | 0.5917\*\*\*  | 0.9488 | *XLIST* | 0.2564\*\*\* | 0.5900 | *XLIST* | 2.3713\*\*\* |
|  | (0.1270)  | (0.6010) |  | (0.0451) | (0.5020) |  | (0.8212) |
| *Issuance* |  | -1.7477\*\*\* | *Issuance* |  | -0.5714 | *Issuance* | 0.0200 |
|  |  | (0.6734) |  |  | (0.5123) |  | (1.2904) |
| *Intangible* | 1.6200\*\*\*  | 4.2511\*\*\* | *Intangible* | 0.4330\*\*\* | 5.6182\*\*\* | *Intangible* | 8.4095\*\*\* |
|  | (0.3421) | (1.6257) |  | (0.0810) | (1.0557) |  | (2.4316) |
| *Intercept* | -1.8470\*\*\* | 11.8992\*\*\* | *Intercept* | -1.2098\*\* | -10.9177\*\*\* | *Intercept* | 9.6682\*\*\* |
|  | (0.3524) | (4.5507) |  | (0.5033) | (3.5630) |  | (2.9128) |
| *Year dummies* | Yes | Yes | *Year dummies* | Yes | Yes | *Year dummies* | Yes |
| *Industry dummies* | Yes | Yes | *Industry dummies* | No | No | *Industry dummies* | Yes |
|  |  |  | *F*-test (Partial *R*²) of excluded instruments | 53.5267\*\*\* (0.1136) |  |  |  |
| Adjusted *R*² (pseudo *R*² )  | (0.2308) | 0.6623 | Adjusted *R*²  |  | 0.6022 | Adjusted *R*² | 0.651 |
| This table addresses endogeneity issues. Panel A presents the results of propensity score matching. Specification (1) presents the results of the probit regression used to calculate propensity scores, where the dependent variable is a dummy that equals one if the variable *Risk\_sentences* is above the median and zero otherwise*.* Specification (2) presents the results of the OLS regressions using a propensity score matched sample, where the dependent variable is *Analyst*, measured as the number of analysts following the firm. Panel B provides the results of instrumental variable estimation. Specification (1) presents the results of the first-stage of the instrumental variable model (*Risk\_sentences* as dependent variable) with *Ind\_ average\_risk* (measured as the average of *Risk\_sentences* for the all other firms in the same industry group) as the instrument for risk disclosure. Specification (2) presents the results of the second-stage regression. Panel C provides the results of the difference-in-difference analysis that tests the effect of the release of the AMF Recommendation of 29 October 2009 on risk factors on analyst following. *Shock* is a dummy variable that takes the value one for the period 2010–2015, and zero otherwise. All independent variables are lagged by one year. See the Appendix for variable definitions. The total sample consists of 857 firm–year observations of non-financial and non-utility French firms on the SBF 120 index over the period 2007–2015. Year and industry dummies following Campbell’s (1996) classification are included in all the regressions, except for specifications in Panel B, which do not include industry dummies. Coefficient standard errors are in parentheses beneath coefficient estimates. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively |

1. ♣ Corresponding author: Unité de recherche CREA (FDEF), Université du Luxembourg, 6, rue Richard Coudenhove-Kalergi, L-1359 Luxembourg; Email : imen.derouiche@uni.lu; phone :  +352 46 66 44 6155. [↑](#footnote-ref-1)
2. In the present research, we adopt the dominant view in the accounting literature that analysts are information users rather than information providers (Dhaliwal *et al.*, 2012; Hope, 2003a; Lang and Lundholm, 1996; Lehavy *et al.*, 2011). This means that analysts’ activities complement corporate disclosure and do not replace it. [↑](#footnote-ref-2)
3. Many studies address alternative aspects of the corporate information environment. For example, [Lang *et al.* (](https://onlinelibrary-wiley-com.proxy.bnl.lu/doi/full/10.1111/j.1475-679X.2011.00422.x#b22 #b23)2004) and Boubaker and Labégore (2008) show that analysts are less likely to follow firms with potential incentives to withhold or manipulate information, such as those with weak corporate governance and those dominated by controlling entities with substantial power and discretion. [Bae *et al.* (2008)](https://onlinelibrary-wiley-com.proxy.bnl.lu/doi/full/10.1111/j.1475-679X.2011.00422.x#b4) and Tan *et al.* ([2011](https://onlinelibrary.wiley.com/doi/full/10.1111/1911-3846.12002#care12002-bib-0040)) report that analyst coverage increases with the extent to which the adoption of International Financial Reporting Standards (IFRS) eliminates differences between the accounting standards used in the firm’s country and those used in the analyst’s country. [↑](#footnote-ref-3)
4. See Articles L.225-100, L. 225-100-1, and paragraphs 2° and 4° of Article L. 225-100-2 of the French Commercial Code. [↑](#footnote-ref-4)
5. See Articles L225-37 and L225-68 of the French Commercial Code. [↑](#footnote-ref-5)
6. This recommendation is part of the Position-Recommendation Doc-2009-16 relative to the Guide to preparing registration documents of French listed firms. [↑](#footnote-ref-6)
7. It is worth noting that, in particular, and similar to the work of Lehavy *et al.* (2011), our study is related to the literature examining the role of annual report quality in the decision of analysts to follow the firm, but the two studies differ in significant aspects. Importantly, Lehavy *et al.* analyse the complexity of the language employed in the entire annual report, namely, the report’s readability, whereas our study focuses on a specific part of this report, that is, the risk factor section, by examining the quantity of information related to risks. Thus, the two studies look at different dimensions of the information provided in the annual report, since we examine how much risk-related information is publicly reported by firms as part of voluntary disclosure, whereas Lehavy *et al.* study the extent to which annual reports are written in an accessible and readable style. [↑](#footnote-ref-7)
8. For example, Tsai *et al.* (2016) show that greater volumes of risk factor disclosure are associated with higher credit risk. [↑](#footnote-ref-8)
9. Other risk word lists are either i) very limited, such as that of Li (2006), who uses only the words *risk* and *uncertain* (and their derivatives); ii) very expanded, such as that of Loughran and McDonald (2011), who propose a comprehensive dictionary of negative, positive, uncertain, and litigious word categories, in addition to strong and weak modal words; or iii) a mix of positive words (i.e. related to opportunities and outlooks) and negative words, such as that of Elshandidy and Neri (2015). [↑](#footnote-ref-9)
10. The results are robust to the winsorization of risk disclosure variables at the first and 99th percentiles. [↑](#footnote-ref-10)
11. This value is calculated by considering a coefficient for *Risk\_sentences* of 2.5631 and a standard deviation of 0.624 for the natural logarithm of the number of risk-related sentences. [↑](#footnote-ref-11)
12. A similar methodology was used by Miihkinen (2012) and Yang *et al.* (2018). [↑](#footnote-ref-12)
13. An example of a firm-specific risk factor in ACCOR’s 2015 annual report is as follows:

*In general, the Group is exposed to the risk of liability in proceedings that may be brought against it before the courts or administrative authorities* (p.132).

 An example of an industry-specific risk factor in ACCOR’s 2015 annual report is as follows:

*Like all hotel operators, AccorHotels is required to comply with the applicable disabled access regulations. This issue has long been addressed and most of the Group’s hotels already have wheelchair-friendly rooms, but further expenditure may be required in the coming years to further enhance hotel accessibility* (p.132). [↑](#footnote-ref-13)
14. These results are robust to using the variable *Risk\_sentences\_ratio*. [↑](#footnote-ref-14)
15. We conduct propensity score marching estimation within a maximum distance of 1% and with replacement, consistent with prior work, such as that of Morgan and Harding ([2006](https://onlinelibrary-wiley-com.proxy.bnl.lu/doi/full/10.1111/fima.12148#fima12148-bib-0062)). [↑](#footnote-ref-15)