

# Voluntary information disclosure and sell-side analyst coverage intensity

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## Abstract

**Purpose** – This paper aims to investigate whether a high level of voluntary disclosure attracts sell-side analysts. In other words, the authors check whether the number of analysts following a given firm increases with the extent of voluntary information that corporate managers provide in annual reports.

**Design/methodology/approach** – The paper relies on regression analyses to study the relationship between the level of coverage by sell-side analysts and the extent of voluntary disclosure for a sample of 155 non-financial firms listed on the Euronext Paris stock exchange and members of the SBF 250 index.

**Findings** – The empirical results show that the number of analysts following a given firm increases with the extent of voluntary disclosure. Consequently, the authors conclude that analysts are interested in the volume of information provided voluntarily by corporate managers. Their interest varies across the voluntary-information categories (strategic, financial, non-financial and governance) disclosed in annual reports.

**Originality/value** – This study extends previous research by investigating sell-side analysts' preferences in terms of voluntary-information categories in annual reports. A better understanding of the effects of sub-categories of voluntary information is useful to corporate managers wishing to meet market expectations and attract sell-side analysts. In fact, the authors verify how each category of disclosed information (strategic, financial, non-financial and governance) affects the analyst coverage intensity. In addition, the authors apply our study in the rather interesting empirical setting that is France, which is characterized by a low investor protection and a large number of active analysts.

**Keywords** Annual reports, Voluntary disclosure, Sell-side analysts, Voluntary-information categories

**Paper type** Research paper



## 1. Introduction

Financial analysts are information intermediaries in the financial markets, where they play a key role by generating earnings forecasts. To generate forecasts that are relevant to investors, analysts deal with a variety of public information (Miller and Sedor, 2014). To realize these estimates, they work in a complex environment and require reliable information. Voluntary disclosures are a useful source of information for financial analysts because it helps them refine their analysis and guide participants in making investment

**JEL classification** – G14, G17, G30, M41

decisions. However, prior research is inconclusive regarding whether analysts incorporate voluntary disclosures into their earnings forecasts. Thus, the present study examines and clarifies whether sell-side analysts are influenced by different voluntary-information categories.

In the principal-agent problem, sell-side analysts are defined as being an important control mechanism that reduces information asymmetries in the capital market (Jensen and Meckling, 1979; Merton, 1987). They act on the financial market by providing forecasts, recommendations and analyses of each firm that they follow. Their services are liable to guide investors toward more profitable and/or less risky securities (Healy and Palepu, 2001). Therefore, the earnings forecasts published by sell-side analysts often cause a significant market reaction. A body of previous research documents abnormal returns on securities a day after the announcement of such publications, and these returns has been known to last for several days (Givoly and Lakonishok, 1979; Lys and Sohn, 1990; Francis and Soffer, 1997; Elgers *et al.*, 2001; Frankel *et al.*, 2006).

For economic agents, information is essential because it is the basis of all their activities. Financial analysts use information from diverse sources to prepare forecasts on companies' performances. As a result, their forecasts are highly sensitive to the quality of the financial reporting of the given firms.

To avoid future forecasting errors, sell-side analysts are encouraged to improve their performance and search for more private information (Barron *et al.*, 2008). However, as opposed to voluntarily disclosed information, gathering private information leads to additional expenses. In addition, the quality of analysts' earnings forecasts and the performance of their recommendations may be improved by using relevant voluntary disclosures (Lang and Lundholm, 1996; Lakhali, 2009; Dhaliwal *et al.*, 2012). As a result, analysts are expected to prefer firms that simultaneously respond to their expectations in terms of information and provide them with more relevant voluntary information.

How corporate voluntary disclosure affects the intensity with which financial analysts cover a corporation is examined by a restricted literature (Lang and Lundholm, 1996; Lakhali, 2009; Chen *et al.*, 2011). Most of these studies are focused on American stock exchanges. Very few studies have examined this issue in European stock exchanges, and even less in the French stock exchange. However, France seems to be well suited for conducting research on sell-side analysts because investor protection is low for French companies (La Porta *et al.*, 1998), and, consequently, the expropriation risk of minority shareholders is higher than in the USA. Thus, this situation may prompt investors to resort more to the services of financial analysts (Boubaker and Labégorre, 2006).

The rare studies (Lakhali, 2009) examining the behavior of sell-side analysts in the French market have linked it to the earnings announcements of listed firms. The present study focuses on another form of disclosure, namely, the extent of voluntary disclosure (EVD) in the annual report, which is done for two major reasons. First, the annual report is considered to be the main document in which information is disclosed by a listed company, and it is therefore used by the various partners to assess the company's performance (Lang and Lundholm, 1993). Second, the content of this reference document keeps changing and becomes more diverse. In their annual reports, French firms provide, in addition to financial and accounting information, information on governance, strategy, environmental and social issues. Consequently, a strong interest is devoted to understanding how sell-side analysts behave with respect to the sub-categories of voluntary information in this document. On this basis, managers may improve the contents of their annual reports to meet market expectations and attract sell-side analysts who, in turn, convince the investors.

This study extends previous research by investigating sell-side analysts' preferences in terms of voluntary-information categories in annual reports. A better understanding of the effects of sub-categories of voluntary information is useful to corporate managers wishing to meet market expectations and attract sell-side analysts. In fact, we verify how each category of disclosed information (strategic, financial, non-financial and governance) affects the analyst coverage intensity. In addition, we apply our study in the rather interesting empirical setting that is France, which is characterized by a low investor protection and a large number of active analysts.

The remainder of the paper is organized as follows: Section 2 presents the institutional framework. Section 3 reviews the literature and hypothesis development. Section 4 outlines the sample, describes the data and presents the methodology. Section 5 reports and discusses the main findings, and Section 6 provides the conclusion.

## 2. Sell-side analysts in France

The globalization of capital markets, the change in the informational environment and the phenomenal increase in electronic trading all ensure that investment decisions are gradually becoming a more complex task for investors. In a context where uncertainty and mistrust prevail, the need for investors to be guided by market experts is evolving, particularly in a context with a low degree of investor protection and where the expropriation risk of minority shareholders is high, as is the case with the French market (La Porta *et al.*, 1998).

Sell-side analysts intervene in the capital market to accomplish this orientation mission with respect to securities that are liable to be the most profitable and the least risky. Healy and Palepu (2001) identify them as being professional information intermediaries that act between the company and the investors. These intermediaries work in brokerage firms and intervene on the secondary securities market. Their main role is to advise investors on the movements of securities. To guide investors in their investment decisions, sell-side analysts provide earnings forecasts, recommendations and analysis reports that include information on each listed firm that they follow.

On the French capital market, the services of sell-side analysts have become increasingly required. In a context where shareholders have little legal protection (La Porta *et al.*, 1997 and 1998), investors and minority shareholders seek information from analysts in the hope of protecting themselves against the risk of expropriation (Boubaker and Labégorre, 2006).

This situation ensures that French listed firms are attracting ever more financial analysts. Lang *et al.* (2004) report an average of seven analysts per French listed firm, and this number increases to eight for Haw *et al.* (2004). More recently, by using a sample of 680 firm-year observations during the years 1999 and 2000, Boubaker and Labégorre (2006) showed that, on average, 12 financial analysts follow the assets of each French listed firm. Lakhil (2009) documents an average of 18 analysts per firm in a sample of 154 companies from the SBF 250 index from 1998 to 2001.

Internationally, French firms rank among the top in terms of coverage by financial analysts. In a study by Chang *et al.* (2000) covering 47 countries, France occupies the fifth position with 23.2 analysts on average per firm, preceded by Germany (32.4), the USA (30.2), The Netherlands (29.5) and Hong Kong (25).

Approximately the same ranking is found by Hope (2003) in a study based on a sample of 20 countries. France ranks seventh with an average number of 22.4 analysts per firm (using a sample of 72 French firms), coming after The Netherlands (29.5), Germany (28.8), Switzerland (24.8), Singapore (23.4), Spain (23.2) and Hong Kong (23.1).

In terms of regulating the activities of financial analysts, France uses the same approach as the USA. First, the Sarbanes–Oxley Act of 2002 obliged these financial intermediaries to

communicate their relationship with the firms that they monitor. Second, it recommends the separation between the activities of financial analysis and those of merchant banks. Two years later, these rules were adopted by the French Parliament in the form of the Financial Security law.

Nevertheless, in terms of regulating financial information, France still lags behind the USA. For example, the study of [Saudagaran and Biddle \(1992\)](#) ranked the eight major world markets according to the financial-disclosure levels required by each country. The eight rank, indicating the highest level of financial-disclosure requirement, went to the USA. France occupied the fifth position with the rank of 4, preceded by Canada (7), Great Britain (6) and The Netherlands (5).

The weakness of the legal protection for investors ([La Porta et al., 1997](#) and [1998](#)) combined with the noteworthy evolution of financial analysts and with the development of codes promoting the transparency of French firms emphasizes the need for a study of financial analysts in the French context.

Various issues require attention in this area of research; in particular, does the extent of corporate voluntary disclosure increase the number of financial analysts that cover it? In other words, does a firm that discloses different voluntary-information categories in its annual report use these publications as financial-marketing tools to attract more financial analysts?

In what follows, the paper focuses on answering this research question by a theoretical investigation followed by an empirical analysis.

### 3. Literature review and hypothesis development

According to agency theory, financial analysts are defined as a control mechanism that reduces information asymmetries in the capital market ([Jensen and Meckling, 1979](#); [Merton, 1987](#)). In fact, financial analysts place their expertise at the service of investors to simplify the job of evaluating firms and to advise investors in their investment decisions. The quality of services that financial analysts provide to investors is strongly influenced by the information they use. Consequently, they are attentive to the disclosure policy of firms.

Various theoretical models describe the relationship between firms monitored by financial analysts and firms' disclosure policy. For instance, [Bhushan \(1989\)](#) suggests that two ways exist to assimilate the relationship between a firm's publications and the number of financial analysts that monitor it. Both depend on the supply and demand for financial analysts' services. First, disclosing additional information to the capital market allows analysts to provide investors with more relevant recommendations. Consequently, voluntary disclosure increases the demand for analysts' services, thereby increasing the level of coverage by financial analysts. Second, the information disclosed by a firm may reduce the cost to analysts of collecting information, thereby allowing them to increase their service offer. As a result, each firm's disclosure increases the number of financial analysts that monitor it. In this respect, [Lobo et al. \(2012\)](#) show that a higher quality of accruals leads to a greater number of financial analysts.

Few empirical studies focus on the relationship between voluntary disclosure and financial analyst coverage. For example, [Lang and Lundholm \(1996\)](#) demonstrate that financial analysts are attracted by firms with a good reputation in terms of disclosure, and this result is confirmed by [Healy et al. \(1999\)](#), who show that firms maintaining high levels of disclosure register a high level of coverage by financial analysts.

In a specific setting of corporate disclosure policy, [Hope \(2003\)](#) documents that the voluntary disclosure of a firm's accounting conventions increases coverage by financial analysts.

Furthermore, *Lang et al. (2004)* show that financial analysts are less attracted by firms suspected of manipulation and nondisclosure of information where the risk of expropriation of minority shareholders is high. Along these lines, *Boubaker and Labégorre (2006)* specify that analysts seem to avoid firms where blockholders are less inclined to disclose information to the public, as in French listed companies. In the same context, *Lakhal (2009)* demonstrates that voluntary disclosure of earnings attracts a large number of financial analysts. According to *Lakhal (2009)*, financial analysts are more likely to follow firms that release a generous volume of voluntary disclosures. Consistently, *Bushee and Miller (2012)* provide evidence that financial analysts are more interested in transparent firms. They show that firms engaged in investor-relation programs register an increase in the number of financial analysts that follow them, as well as in media coverage and in the firm's visibility on the market.

In light of this literature, firms that better satisfy analysts' requirements for information, with, *inter alia*, a higher EVD, are more likely to attract financial analysts. Accordingly, the number of financial analysts following listed companies should be positively associated with the extent of their different voluntary-information categories in annual reports. From this, we draw the following hypothesis:

*H1.* A positive relationship exists between the level of coverage by financial analysts and the EVD in annual reports.

#### 4. Data collection and research methodology

##### 4.1 Data collection

The starting sample for this study consists of 250 French firms listed on the Euronext Paris stock exchange and members of the SBF 250 index. As in prior studies, we discarded regulated utilities (SIC codes 4,900-4999) and financial firms (SIC codes 6,000-6999), as they operate in an environment where disclosure is a result of specific legal and regulatory requirements. We also excluded firms whose financial data is unavailable for at least one fiscal year. Thus, our final sample comprises 155 firms that are tracked from 2004 to 2012.

Financial and accounting data were obtained from the *Datastream* and *Worldscope* databases. Annual reports were downloaded from the AMF[1] and firms' websites.

*Table I* presents the industry distribution of our sample, the weight of each sector with respect to the global sample and the representativeness of each sector-based segment with respect to the total number of firms listed on the Euronext Paris stock exchange and operating in the same sector.

Industry	Code	No. of firms in the sample (A)	(%)	Total no. of listed firms in Euronext – Paris (B)	A/B %
Oil and gas	0001	5	3.352	11	45.455
Basic materials	1000	7	5.028	36	19.444
Industrials	2000	34	24.022	114	29.091
Consumer goods	3000	32	18.995	110	29.091
Health care	4000	14	9.497	41	34.146
Consumer services	5000	29	18.436	80	36.25
Telecommunications	6000	1	1.117	5	20
Utility services	7000	6	4.469	25	24
Technology	9000	27	15.084	110	24.545
Total		155	100	532	29.135

**Table I.**  
Industry distribution  
of 155 studied firms

**Source:** adopted by NYSE Euronext

## 4.2 Research methodology

Prior to investigating the relationship between voluntary disclosure and financial analyst coverage, we followed Lakhali (2009) and tested for the endogeneity problem using the Hausman statistic. The results show that voluntary disclosure impacts the financial analyst decisions. The fixed individual effect models appear appropriate to our data. These results are consistent with the theoretical prediction of Cadoret *et al.* (2009). According to these authors, if the goal is to analyze the behavior of each individual as such, the fixed effect models will be appropriate. This is concretely what we are trying to do in our study by examining the sell-side analysts' behavior and its relationship with the voluntary disclosure.

In this study, we perform a regression analysis of the number of financial analysts on the level of voluntary disclosure in annual reports, as well as on firm size, variability of earnings, market-to-book (MTB) ratio and size of auditor certifying firm accounts. To do this, we apply a multiple regression model with fixed individual effects, which is expressed as follows:

$$\ln(1 + ANF)_{it} = \alpha_i + \beta_1 EVD_{it} + \beta_2 Size_{it} + \beta_3 Surprise_{it} + \beta_4 MTB_{it} + \beta_5 Audit_{it} + \mu_{it}$$

where ANF is the average number of financial analysts, and EVD is the extent of voluntary information disclosure in the annual report. This expression corresponds in the first regression to the global disclosure index and in regressions two to five to the sub-indices of voluntary information disclosure (strategic, non-financial, financial and governance, respectively).  $\alpha_i$  expresses the fixed individual effects,  $\beta_j$  are the regression coefficients of the models with  $j = 1, \dots, 5$  and  $\mu_{it}$  is the error term.

## 4.3 Measurement of variables

**4.3.1 Dependent variable: intensity of coverage by financial analysts.** The intensity of coverage by financial analysts is computed as the logarithm of one plus the average number of financial analysts that follow a given firm during the quotation year.

**4.3.2 Independent variables: extent of voluntary disclosure.** The EVD in the annual report is measured by a disclosure index developed on the basis of a list of items. The development of this list is based on the previous studies of Meek *et al.* (1995), Botosan (1997), Chau and Gray (2002), Eng and Mak (2003), Lim *et al.* (2007) and Francis *et al.* (2008). This index includes a total of 112 items, which fall into four general categories: strategic information, financial information, non-financial information and information regarding corporate governance. Following Cooke (1992), we analyze the annual report of each firm in the sample for every fiscal year to check that all information from the list of items appears in the financial statement. Table II presents the checklist of items included in the disclosure scores. To avoid subjectivity, we consider all disclosed information to be of equal importance despite the fact that the information content may vary substantially from one firm to another. Consequently, a binary technique is used by assigning a value of one when a given item exists in a report, and zero otherwise. The total score of each firm in our sample is calculated as an unweighted sum of the present items. To obtain the disclosure index, this score is divided by the score corresponding to the total number of selected items. The disclosure sub-indices corresponding to each category of information are calculated in the same manner.

**4.3.3 Control variables.** In addition to the corporate disclosure policy, the literature reveals other determinants of financial-analyst coverage. These determinants are introduced into our model as control variables.

**4.3.3.1 Firm size.** Bhushan (1989), among others, suggests that large firms are more solicited by financial analysts than small firms. In fact, large firms have more

Checklist of items	References
<i>A – Strategic information</i>	
<i>A1. General information about the firm</i>	
1. Brief history of company	A, B, C, E
2. General description of the business	B, D
3. Main products	B, D
4. Main Markets	B, D
<i>A2. Corporate strategy</i>	
5. Statement of the main objectives	A, B, C, D, E
6. Statement of the financial objectives	A, C, E
7. Current strategy	A, B, C, F
8. Impact of strategy on current results	B
9. Future strategy	A, B, C
10. Impact of strategy on future results	A, C, E
<i>A3. R&amp;D activities</i>	
11. Description of R&D projects	A, C
12. Corporate policy on R&D	A, C
13. Location of R&D activities	A, C, D
14. Number employed in R&D	A, C, E
<i>A4. Analysis and discussion of management review of projects</i>	
15. Review of operations	B
16. Competitive environment	B, D
17. The most significant events	B, D
18. Change in sales and profits	B, D
19. Change in cost of goods sold	B, D
20. Change in expenses	B, D
21. Change in inventory	B, D
22. Change in the share price	B, D
<i>A5. Future prospects</i>	
23. Future development channels	A, B, C
24. Qualitative forecast of sales	A, B, C, E
25. Quantitative forecast of sales	A, B, C, D, F
26. Qualitative forecast of profits	A, B, C, D, E, F
27. Quantitative forecast of profits	A, B, C, E
28. Assumptions underlying the forecast	A, B, C
29. Review of forecasts	A, B, C
30. Description of capital project committed	A, B, C
<i>B – No-financial information</i>	
<i>B1. Employees information</i>	
1. Geographical distribution of employees	A, C
2. Number of employees by sex	A, C
3. Number of employees by age	A, C
4. Categories of employees by function	A, C
5. Number of employees for 2 or more years	A, C, E
6. Average compensation per employee	A, B
7. Added value per employee	A, B
8. Data productivity	A, B, C
9. Safety policy	A, B, C

**Table II.**  
The checklist of  
voluntary disclosure

(continued)

Checklist of items	References
10. Cost of safety measures	A, C
11. Data on accidents	A, C, E
12. Policy on communication	A, C
13. Redundancy information	A, C
14. Reason for changes in employees' number or categories over time	A, C
15. Recruitment problems and related policy	A, C
<i>B2. Information about the training policy</i>	
16. Amount spent in training program	A, C, E
17. Nature of training	A, C, E
18. Policy on training	A, C, E
19. Categories of employees trained	A, C, E
<i>B3. Social policy and value-added information</i>	
20. Safety of products	A, C
21. Program of environmental protection	A, C, E
22. Charitable donations	A, C, E
23. Community programs	A, C, E
24. Value added data	A, C, E
25. Value added ratios	A, C, E
26. Qualitative value-added information	A, C, E
<i>B4. Segmental information</i>	
27. Geographical distribution of invested capital	A, C, E
28. Geographical distribution of net assets	A, C
29. Geographical distribution of production	A, C, E
30. Expenditure in the business lines	A, C
31. Revenue by business line	A, C
32. Competitor analysis quantitative	A, C
33. Competitor analysis qualitative	A, C
34. Market share analysis-quantitative	A, C
35. Market share analysis-qualitative	A, C
C – Financial information	
<i>C1. Performance indicators (without from the financial statements)</i>	
1. Performance indicators	A, B, C
2. Financial data for the last five years	A, B, C, D, E
3. Turnover	A, B, C, D, F
4. Net income	A, B, C, D, F
5. Shareholders' equity	A, B, C, D
6. Total assets	A, B, C, D, F
7. Earnings per share	A, B, C
8. Dividend payout policy	A, B, C
9. Transfer pricing policy	A, B, C
10. Impact of any accounting policy changes on results	A, B, C
11. Advertising expenditure	A, B, C, E
12. Effect of inflation on results	A, B, C
13. Effect of inflation on assets	A, B, C
14. Effect of fluctuating interest rates on the result	A, B, C, E

(continued)

Table II.



Checklist of items	References
<i>C2. Financial ratios</i>	
15. Liquidity ratio	A, B, C, E
16. Turnover ratio of assets	A, B, C
17. Debt ratio	A, B, C, E
18. Profitability ratios	A, B, C, E, F
19. Other useful ratios	A, B, C, E
<i>C3. Forecasted information</i>	
20. Cash flow forecast	A, B, C, D
21. Estimates of capital increase	A, B, C
22. Earnings estimates	A, B, C
23. Effect of inflation currency fluctuations on future operation	A, C
24. Effect of currency fluctuation of interest rates on future operations	A, C
<i>C4. Information on exchange rates</i>	
25. Impact of currency fluctuations on current results	A, B, C
26. Impact of currency fluctuations on future operations	A, C, E
27. Estimates of currency fluctuations	A, B, C
28. Exchange rates used in accounting	A, B, C
29. Long-term debt by currency	A, C
30. Short-term debt by currency	A, C
<i>C5. Other financial information</i>	
31. Share price at year end	A, C
32. Share prices trend	A, C, E
33. Market capitalization at year end	A, C, E
34. Trend of market capitalization	A, C
35. Size of shareholdings	A, C
36. Forecasted market share	A, C, D, F
D – Governance information	
1. Ownership structure	A, C
2. Organizational chart	A, B, C, E
Composition of the board of director	
3. Personal profile	A, C
4. Description of the position occupied	A, C
5. Duration of belonging to the company	A, B, C
6. Number of shareholders belonging to the board of directors	A, B, C
7. Academic profile of the directors	A, B, C
8. Presence of internal audit committee	A, B, C
9. Age of the executives	A, B, C
10. Profile of the executives	A, B, C
11. Individual remuneration	A, B, C

**Notes:** This table presents the checklist of items used to develop the disclosure index; A: Meek *et al.* (1995); B: Eng and Mak (2003); C: Chau and Gray (2002); D: Botosan (1997); E: Lim *et al.* (2007); F: Francis *et al.* (2008)

Table II.

visibility, are more prestigious (Rajan and Servaes, 1997) and are more appealing to investors (Bhushan, 1989). According to Lang and Lundholm (1996), such firms have a better forward-looking statement, and estimating their earnings is easier and more precise. As a result, they are more likely to have a high level of coverage by financial analysts.

Empirically, several studies (Lang *et al.*, 2003) indicate a positive relationship between firm size and financial-analyst coverage. In light of this body of work, this variable will be measured by the natural logarithm of total assets.

4.3.3.2 Earnings surprise. This variable is a determinant of financial-analyst coverage. Relevant studies (O'Brien and Bhushan, 1990; Lang and Lundholm, 1996; Marston, 1997; Lang *et al.*, 2003 and 2004; Boubaker and Labégorre, 2006; Lakhali, 2009) find a negative relationship between earnings surprise and the level of coverage by financial analysts. Financial analysts tend to more closely follow the stock value of firms with more predictable earnings. The persistence of disclosed earnings reduces the uncertainty of the firm's future earnings, so that analysts have a lower risk of forecast errors.

Lang and Lundholm (1996) and Boubaker and Labégorre (2006) defined earnings surprise as the absolute value of the difference between earnings per share for year  $n$  and those for year  $n-1$  divided by the price at the beginning of fiscal year  $n$ . More recently, Lakhali (2009) defined the earnings surprise as the difference between the earnings per share for year  $n$  and those for year  $n - 1$  divided by the earnings per share for year  $n - 1$ . In the present study, we use the same measure of earning surprise as Lakhali (2009). We assume that this variable reflects the surprise of financial analysts upon discovering the actual earnings on the day of the official announcement.

4.3.3.3 Market-to-book ratio. Fama and French (1992) specify that firms with a high book-to-price ratio offer higher yields than firm with a low book-to-price ratio. However, Hope (2003) states that analysts tend to favor shares that are profitable and that have growth potential.

In her study in the French context, Lakhali (2009) considers the MTB ratio as a determinant of analyst coverage. Hence, we use herein the MTB firm ratio as a control variable.

4.3.3.4 Audit quality. Previous literature suggests that big auditors incite firms to disclose high-quality information (Firth, 1979; DeAngelo, 1981). As a result, the designation of a big auditor contributes to improving a firm's financial communication (Francis *et al.*, 1999). Disclosed information of good quality facilitates the analysts' job of estimating a firm's earnings and, consequently, improves their predictive capacity. As a result, financial analysts should be more strongly drawn to firms with financial statements that are certified by big auditors.

The results of several empirical studies, notably those of Boubaker and Labégorre (2006), indicate that the size of the audit firm is a determinant of the number of analysts. Following these studies, we use in our models a binary variable equal to one if a firm's financial statements are certified by at least one auditor from the "Big 4", and zero otherwise.

Table III gives the definition of all variables used in the empirical analysis[2], as well as their denominations, measures, references and predicted signs.

## 5. Empirical results

### 5.1 Descriptive statistics

Table IV reports the descriptive statistics of the full sample, which reveal that nine was the average number of financial analysts per French firm between 2004 and 2012. This result is similar to what Lang *et al.* (2004) reported (seven analysts per French firm).

Some non-financial firms belonging to the SBF250 index attract financial analysts and have a maximum number of 34 analysts. Others are distinctly less attractive and are not covered by these financial intermediaries (they have zero analysts). The heterogeneity of the

**Table III.**  
Definitions and  
measures of used  
variables

Variables	Names	Measures	References	Expected sign
<i>Dependent variables</i>				
Financial analysts' coverage	$\ln(1 + \text{NAF})$	The natural logarithm of one plus the average number of analysts that follow a given firm during the quotation year	Lang <i>et al.</i> (2004), Rajan and Servaes (1997), Lehavy <i>et al.</i> (2011), Bushee and Miller (2012)	
<i>Independent variables</i>				
The extent of voluntary disclosure in the annual report	ARVD	Firm disclosure index is equal to firm disclosure score divided by the total number of item in the checklist	Meek <i>et al.</i> (1995), Chau and Gray (2002), Botosan (1997), Eng and Mak (2003), Lim <i>et al.</i> (2007), Francis <i>et al.</i> (2008)	Positive
The extent of strategic information disclosed voluntarily in the annual report	STGVD	Strategic disclosure sub-index		
The extent of non-financial information provided voluntarily in the annual report	NFNVD	Non-financial disclosure sub-index		
The extent of financial information provided voluntarily in the annual report	FNVD	Financial disclosure sub-index		
The extent of governance information provided voluntarily in the annual report	GOVD	Governance disclosure sub-index		
Firm size	Size	The natural logarithm of total assets	Lang and Lundholm (1996), Lang <i>et al.</i> (2003), Boubaker and Labégorre (2006), Lakhali (2009)	Positive
Earnings surprise	Surprise	The difference between the earnings per share for year $n$ and those for year $n - 1$ divided by the earnings per share for year $n - 1$	O'Brien and Bhushan (1990), Lang and Lundholm (1996), Marston (1997), Lang <i>et al.</i> (2003, 2004), Lakhali (2009)	Negative
Market-to-book	MTB	Market-to-book value ratio	Lang and Lundholm (1996), Hope (2003), Lakhali (2009)	Positive
Audit quality	Audit	Binary variable equal to one if a firm's financial statements are certified by at least one auditor from the "Big 4", and zero otherwise	Hope (2003), Boubaker and Labégorre (2006)	Positive

Variables	Minimum	25%	Mean	Median	75%	Maximum	SD
<i>Dependent variables</i>							
ANF	0	4	9.0461	8	13	34	6.5770
<i>Independent variables</i>							
ARVD	0.0708	0.3491	0.4318	0.4367	0.5111	0.7122	0.1248
STGVD	0.0333	0.3637	0.4652	0.476	0.5666	0.7666	0.1473
NFNVD	0	0.27	0.3883	0.39	0.5121	0.756	0.1614
FNVD	0.0541	0.2783	0.3698	0.3618	0.4575	0.6959	0.1284
GOVD	0.0909	0.3818	0.5964	0.6363	0.7735	1	0.2404
<i>Control variables</i>							
Size	8.9369	12.8269	14.1495	13.7926	15.4446	18.6095	1.8926
Surprise	-20.0714	-2.0075	-0.9548	-0.9274	-0.1069	28.5000	3.0545
MTB	-2.1847	2.0235	2.6603	2.7563	3.3604	6.4894	1.1331
Audit	0.0000	1	0.8709	1	1	1.0000	0.3354

**Notes:** ARVD = annual report disclosure index; STGVD, NFNV, FNVD and GOVD = sub-indices of strategic, non-financial, financial and governance information disclosure, respectively; Size = natural logarithm of firm total assets; Surprise = earnings surprise that equals to the difference between the earnings per share for year  $n$  and those for year  $n - 1$  divided by the earnings per share for year  $n - 1$ ; MTB = market to book value ratio; Audit = binary variable equal to one if a firm's financial statements are certified by at least one auditor from the "Big 4", and zero otherwise

**Table IV.**  
Descriptive statistics

coverage of these firms by financial analysts is reflected by the standard deviation, which reaches 6.577.

The average value of the disclosure index is 43.18 per cent for our sample. Some firms voluntarily make a high level of information available, up to a maximum disclosure index of 71.22 per cent, whereas others prefer to retain this information, with the minimum disclosure index being 7.08 per cent. The distribution of voluntary disclosure for our sample is dispersed, with a standard deviation of 0.1248.

Consider now the control variables. The variability of earnings has an average value (median) of  $-0.9548$  ( $-0.9274$ ). The MTB ratio for firms examined herein has an average value of 2.6603. It varies from a minimum of  $-2.1847$  to a maximum of 6.4894 with a standard deviation of 1.1331. In the study of [Lakhali \(2009\)](#), the MTB varies from a minimum of  $-2.1129$  to a maximum of 3.9339 with a standard deviation of 0.6819.

On average, 87.09 per cent of firm accounts in our sample are certified by at least one Big-4 auditor between 2004 and 2012.

[Table V](#) presents the Pearson correlation matrix between the independent variables. All the correlations between disclosure indices and control variables are lower than the threshold of 0.8 specified by [Kennedy \(1985\)](#) and [Gujarati \(1988\)](#). The correlation coefficients between disclosure sub-indices (STGVD, NFNV, FNVD and GOVD) range from 0.393 to 0.595. Despite certain statistically significant correlations between the independent variables, the coefficients do not appear to be high enough to cause serious multi-collinearity problems.

### 5.2 Regression results

[Table VI](#) summarizes the results of the multiple regressions conducted on a sample of 155 firms listed on the Euronext Paris stock exchange and members of the SBF250 index.

The results of the first regression show that the number of analysts increases with a high level of voluntary disclosure in the annual report. In fact, the coefficient of the ARVD variable

**Table V.**  
Pearson correlation  
matrix

Variables	ARVD	STRVD	NFNVD	FNVD	GOVD	Size	Surprise	MTB	Audit
ARVD	1	0.780 (0.000)	0.783 (0.000)	0.730 (0.000)	0.671 (0.000)	0.196 (0.000)	-0.020 (0.544)	0.014 (0.666)	0.022 (0.511)
STRVD		1	0.393 (0.000)	0.595 (0.000)	0.467 (0.000)	0.108 (0.001)	-0.030 (0.363)	0.015 (0.654)	-0.002 (0.960)
NFNVD			1	0.477 (0.000)	0.389 (0.000)	0.265 (0.000)	0.010 (0.751)	-0.022 (0.493)	0.066 (0.046)
FNVD				1	0.474 (0.000)	0.066 (0.043)	-0.006 (0.850)	0.039 (0.230)	-0.034 (0.301)
GOVD					1	0.158 (0.000)	-0.050 (0.126)	-0.007 (0.840)	0.041 (0.209)
Size						1	-0.336 (0.000)	0.355 (0.000)	0.350 (0.000)
Surprise							1	-0.568 (0.000)	-0.057 (0.084)
MTB								1	0.073 (0.025)
Audit									1

**Note:** (*p*-values) in parentheses are below the correlation coefficients; ARVD = annual report disclosure index; STGVD, NFNVD, FNVD and GOVD = sub-indices of strategic, non-financial, financial and governance information disclosure, respectively; Size = natural logarithm of firm total assets; Surprise = earnings surprise that equals to the difference between the earnings per share for year *n* - 1 and those for year *n* - 1 divided by the earnings per share for year *n* - 1; MTB = market to book value ratio; Audit = binary variable equal to one if a firm's financial statements are certified by at least one auditor from the "Big 4", and zero otherwise

Variables	Dependent variable: Ln (1 + ANF) Coefficients (t-statistics)			
Intercept	-1.5469*** (-9.990)	-1.5857*** (-10.168)	-1.4228*** (-9.409)	-1.4355*** (-9.114)
ARVD	0.5823*** (4.012)	-	-	-
STGVD	-	0.5451*** (4.457)	-	-
NFNVD	-	-	0.3657*** (3.181)	-
FNVD	-	-	-	0.1055 (0.762)
GOVD	-	-	-	-
Size	0.2489*** (2.792)	0.2522*** (23.508)	0.2478*** (22.093)	0.2580*** (23.951)
Surprise	0.1174** (2.020)	0.0118** (2.036)	0.0108* (1.865)	0.0112* (1.908)
MTB	-1.1185*** (-7.039)	-0.1205*** (-7.185)	-0.1156*** (-6.792)	-0.1233*** (-7.278)
Audit	0.1882*** (3.343)	0.1877*** (3.341)	0.1827*** (3.237)	0.1767*** (3.112)
Adjusted R <sup>2</sup>	0.4853	0.4874	0.4820	0.4766

**Notes:** ARVD = annual report disclosure index; STGVD, NFNVD, FNVD and GOVD = sub-indices of strategic, non-financial, financial and governance information disclosure, respectively; Size = natural logarithm of firm total assets; *Surprise* = earnings surprise that equals to the difference between the earnings per share for year  $n$  and those for year  $n - 1$  divided by the earnings per share for year  $n - 1$ ; MTB = market to book value ratio; Audit = binary variable equal to one if a firm's financial statements are certified by at least one auditor from the "Big 4", and zero otherwise; (t-statistics) in parentheses are below the regression coefficients \*\*\*, \*\* and \* denote statistical significance at 1, 5 and 10% level, respectively

**Table VI.**  
The results of the  
regression models

is positive (0.5823) and statistically significant at the 1 per cent level. Financial analysts are thus attracted by firms that disclose more voluntary information in their annual reports. A high level of voluntary information disclosure reduces the level of private information. In this case, financial analysts are less inclined to search for other sources of information (Lakhal, 2009). Consequently, they are spurred to continue to follow the firms that provide high levels of voluntary information.

Furthermore, the volume of voluntary information made available by French firms in their annual reports provides analysts with additional indicators, thereby allowing them to improve their earnings forecasts and make recommendations. These results confirm those of prior studies (Lang and Lundholm, 1996; Hope, 2003; Lakhal, 2009) by empirically demonstrating that voluntary disclosure is a pull-factor for financial analysts. Thus, the research hypothesis of this study is corroborated. A high level of voluntary disclosure of information in the annual report of French firms positively influences the coverage of these firms by financial analysts.

In a more in-depth analysis, we perform a regression analysis of the number of analysts on the disclosure sub-indices pertaining to each category of voluntary information disclosed. The purpose of these regressions is to check whether a difference exists at the level of interest granted by financial analysts in the various categories of disclosed information.

Table VI shows that the coefficient of the STGVD variable is positive (0.5451) and statistically significant at the 1 per cent level. This suggests a positive relationship between the number of financial analysts and the level of voluntary disclosure of strategic information. This result corresponds to the suggestion of Boubaker and Labégorre (2006) that financial analysts are interested in information related to firm strategy and published in the stock market floatation prospectus. In our case, financial analysts are interested in the strategic information voluntarily disclosed in the annual report.

The coefficient of the NFNVD variable is positive (0.3657) and statistically significant at the 1 per cent level. As non-financial information is useful for evaluating firm performance, it can attract analysts. Consequently, their number increases according to the level of non-financial voluntary information disclosed.

The relationship between the level of coverage by financial analysts and the disclosure of governance information is positive and statistically significant at the 1 per cent level. Thus, it appears that financial analysts are interested in governance information disclosed voluntarily in the annual report. As the disclosure of information on corporate governance reveals details about the control mechanisms adopted within the firm, it allows the information asymmetries between internal and external partners to be reduced (Cormier *et al.*, 2010). Thus, financial analysts are incited to follow firms that voluntarily disclose more information pertaining to their governance system.

The interest of financial analysts in voluntarily disclosed information differs between the sub-categories of voluntary disclosure. The results show that financial analysts are more attracted by volumes of strategic (coefficient = 0.5451), non-financial (coefficient = 0.3657) and governance information (coefficient = 0.3643) than by the volume of extensive voluntary financial information (provided outside the financial statements). Indeed, the findings show a positive and statistically non-significant relationship between the financial information sub-category and the number of sell-side analysts. To evaluate companies' performance, sell-side analysts use primarily the financial information provided in the firms' financial statements. This is likely to explain the non-significant impact of the voluntary financial information on analyst coverage and,

consequently, the unattractiveness of extensive financial information provided outside the financial statements.

As regards the control variables, the coefficient of firm size is positive and statistically significant in the first regression concerning the global level of voluntary disclosure as in the other regressions pertaining to the sub-categories of voluntary disclosure. These results suggest that financial analysts are more attracted to large French firms. Boubaker and Labégorre (2006) and Lakhal (2009) reach the same conclusions for the French stock market. Various prior studies also obtained the same results from different financial markets; for example, Lang and Lundholm (1996) and Lehavy *et al.* (2011) in the USA, Marston (1997) in Great Britain and Hope (2003) in an international setting.

Furthermore, the earnings surprise of French firms positively influences their level of coverage by financial analysts. Contrary to what is indicated by some previous studies (Lang *et al.*, 2003 and 2004; Boubaker and Labégorre, 2006; Lakhal, 2009), this result highlights that a high variability of income stimulates the interest of financial analysts. This can be explained by the fact that, when earnings are not sufficiently stable, forecasting is more difficult (Lang and Lundholm, 1996). As a result, investors should turn more often to financial analysts for guidance. Depending on the supply and demand of financial-analyst services (Bhushan, 1989), an increase in demand incites such analysts to follow firms with higher earnings variability to provide investors with the expected recommendations.

The coefficients of MTB variables are negative and statistically significant at the 1 per cent level. It appears that, in France, financial analysts prefer undervalued firms (with a low MTB ratio). In this context, financial analysts possibly estimate that, in time, the value of undervalued firms will increase to reach a fair value. Consequently, they express more interest in undervalued firms.

The coefficient of the audit quality variable is statistically significant at the 1 per cent level. Based on these results, French firms whose accounts are certified by a Big-4 auditor appear particularly attractive to financial analysts. In the same context, Boubaker and Labégorre (2006) reach a similar conclusion.

To assess the robustness of the results shown in Table VI, we carry out additional analyses. These tests examine whether the reported regression results are driven by potential effects of serial correlation. We apply the Fama–MacBeth regression approach to assess the stability of the casual relationships over time of our initial results (Chung *et al.*, 2005). In addition, as earnings variability is of particular interest to financial analysts, we use a second proxy computed as the standard deviation of earnings over the past three years. Table VII reports the results of the Fama–MacBeth regressions. The findings confirm and give added credibility to those already presented. In general, the regression coefficients keep the same sign and statistical significance. Thus, these findings alleviate a concern that our earlier reported results are driven by a mechanical correlation especially between the level of coverage by sell-side analysts and the EVD provided in annual reports.

## 6. Conclusion

This study investigates whether a high level of voluntarily disclosed information in a firm's annual report increases its coverage by financial analysts.

In view of prior studies (Lang and Lundholm, 1996; Hope, 2003; Lakhal, 2009; Lehavy *et al.*, 2011), we suppose herein that the intensity of coverage by sell-side analysts increases with the EVD. To check this hypothesis, we apply multiple regression models to panel data



**Table VII.**  
The results of the regression models using the Fama–MacBeth approach

Variables	Dependent variable: Ln (1 + ANF) Coefficients ( <i>t</i> -statistics)			
Intercept	-1.2902*** (-4.572)	-1.3728*** (-4.837)	-1.1527*** (-4.071)	-1.1908*** (-4.356)
ARVD	0.5542*** (10.944)	-	-	-
STGVD	-	0.5398*** (16.622)	-	-
NFNVD	-	-	0.3498*** (6.354)	-
FNVD	-	-	-	0.0883 (1.121)
GOVD	-	-	-	-
Size	0.2465*** (21.985)	0.2500*** (22.622)	0.2452*** (24.272)	0.2550*** (23.428)
Surprise	0.0760* (1.766)	0.0770*** (1.975)	0.0553 (1.133)	0.0790* (1.891)
MTB	-0.1253*** (-7.854)	-0.1267*** (-7.954)	-0.1235*** (-7.656)	-0.1295*** (-8.041)
Audit	0.1900*** (6.959)	0.1893*** (6.989)	0.1843*** (7.109)	0.1812*** (6.650)
Adjusted <i>R</i> <sup>2</sup>	0.4345	0.4373	0.4310	0.4260

**Notes:** ARVD = annual report disclosure index; STGVD, NFNVD, NFVD and GOVD = sub-indices of strategic, non-financial, financial and governance information disclosure, respectively; Size = logarithm of firm total assets; Surprise = standard deviation of earnings over the last three years; MTB = market to book value ratio; Audit = binary variable equal to one if a firm's financial statements are certified by at least one auditor from the "Big 4", and zero otherwise; (*t*-statistics) in parentheses are below the regression coefficients \*\*\*, \*\* and \* denote statistical significance at 1, 5 and 10% level, respectively

of 155 non-financial firms listed on the Euronext Paris stock exchange and members of the SBF 250 index.

The results show a positive and statistically significant relationship between the extent of information voluntarily disclosed in annual reports and the number of financial analysts following the firm. Our results confirm those of prior studies (Lang and Lundholm, 1996; Lakhal, 2009) by suggesting that the level of coverage by financial analysts increases with the level of information voluntarily disclosed by a firm. Furthermore, these results confirm the prediction that the volume of information voluntarily disclosed by a firm may serve as a financial marketing technique for attracting analysts and influencing their behavior.

To deepen our analysis, we perform a regression analysis of the number of financial analysts on the disclosure sub-indices pertaining to strategic, non-financial, financial and governance information.

The results show that financial analysts are more attracted by volumes of strategic, non-financial and governance information than by the volume of extensive voluntary financial information (provided outside the financial statements). Indeed, the findings show a positive and statistically non-significant relationship between the financial information sub-category and the number of sell-side analysts. To evaluate companies' performance, sell-side analysts use primarily the financial information provided in the firms' financial statements. This is likely to explain the non-significant impact of the voluntary financial information on analyst coverage and, consequently, the unattractiveness of extensive financial information provided outside the financial statements.

In light of these results, the EVD in a firm's annual report appears to be a determinant of the firm's sell-side analyst coverage intensity. This conclusion may be of interest to corporate managers because it emphasizes the attractiveness of voluntary disclosure to the financial market. Furthermore, this study makes it possible to investigate the sub-categories of voluntary disclosure that are liable to satisfy market players. On this basis, managers may improve the contents of their annual reports to meet market expectations and attract sell-side analysts who, in turn, convince the investors.

## Notes

1. AMF (*Autorité des Marchés Financiers*) is the French equivalent of the US Securities and Exchange Commission (SEC).
2. We have used the available information to compute these variables. Some other different proxies and/or possible moderating effects such as the presence of active investors in the ownership structure may be taken into consideration to deepen the analysis. We leave this interesting modeling feature for future extension.

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