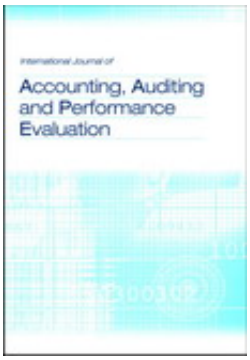

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Is the financial information still useful in issuing stock recommendations? Evidence from the Tunisian financial analysts

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Is the financial information still useful in issuing stock recommendations? Evidence from the Tunisian financial analysts

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Abstract: This study aims to determine the relevance of different information types in explaining financial analysts' recommendations concerning Tunisian listed firms. Three hypotheses are proposed and evaluated through a content analysis approach and a logistic regression analysis. Despite the growing importance of non-financial information in recent years, our findings show that financial information has not lost its usefulness. More precisely, buy and hold recommendations refer to the two types of information (leverage, dividend payout, earnings, and market position). In contrast, sell recommendations seem to be particularly associated with the financial one (dividend payout, earnings). As an economic crisis marks the period under study, these results suggest that analysts often use non-financial information to justify producing an unexpected favourable recommendation in a context of distress. They imply that firms, especially those relatively unattractive to investors, can bet on this type of information to hide their gloomy reality. Moreover, the analysts' optimism should be taken into account by investors when making their investment decisions. Finally, accounting policymakers have to improve more and more accounting standards to preserve financial information usefulness.

Keywords: usefulness; financial information; non-financial information; financial analysts' recommendations; emerging market; MENA countries; and analysts' optimism.

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1 Introduction

Financial analysts play a crucial informational role in financial markets. They work for brokerage firms, investment banks, and think tanks. Their missions include assessing the performance of listed companies, forecasting their future profits, and providing recommendations to their clients (Beyer et al., 2010). As these latter do not have the technical expertise to analyse companies thoroughly, they rely on financial analysts' reports to make investment decisions (Barber et al., 2001; Fogarty and Rogers, 2005; Asquith et al., 2005; Frankel et al., 2006). To formulate his recommendations, the financial analyst has two types of information: financial one based on accounting numbers and non-financial one collected from different sources like private meetings with companies' managers, shareholders meetings, industry specialised magazines, etc.

There are two streams of research on the usefulness of these two types of information. One stream advances financial type (Previts et al., 1994; Rogers and Grant, 1997). Another stream, more recent, gives precedence to the non-financial one (García-Meca, 2005; Flöstrand, 2006; García-Meca and Martinez, 2007; Orens and Lybaert, 2007; Simpson, 2010; Abhayawansa and Guthrie, 2012). Through this study, we aim to identify which information set drives financial analysts' recommendations from a sample of Tunisian companies listed on the Tunis stock exchange.

At least two reasons make this issue interesting for the Tunisian market. The first would be the economic crisis that has hit Tunisia over the past decade, aggravated by the COVID-19 pandemic. It would make Tunisian investors more risk averse. Such a context

may lead investors to resort more intensively to analysts to reduce the uncertainty in their decision-making processes (Arand and Kerl, 2012). Secondly, producing recommendations by Tunisian financial analysts, initially reserved for banks, has recently taken on more scope by covering all listed companies. To strengthen this activity, Tunisian analysts, whose number is constantly increasing, have every interest in convincing investors more and more of the usefulness of their recommendations. In such a context, analysts would favour non-financial information because it is subject to considerable managerial discretion (Simpson, 2010). The flexibility in their interpretations allows financial analysts to choose the one that is more suitable to stimulate the purchase of stocks. In particular, they would try to avoid issuing sell recommendations because they are perceived as an awful signal by investors and may destabilise an emerging market in its quest for expansion. Such flexibility in interpretation does not exist for financial information, which is considered more readily verifiable, clear, and evident (Tan et al., 2019). In addition, they would try to produce convergent and consensual recommendations by disclosing less private information. Indeed, unlike in developed markets, stock prices tend to vary in the same direction in emerging markets and camouflage analysts' information (Morck et al., 2000). Thus, financial analysts would deviate from their dedicated role: Instead of improving market efficiency by producing recommendations revealing the company's reality, they would ultimately reduce it by adopting a mimetic behaviour.

The specificities of emerging markets raise questions about the determinants of the recommendations produced by Tunisian financial analysts. To the best of our knowledge, this problem is still unexplored. So, our study will be among the first to shed light on this subject. It will identify the significant factors for Tunisian analysts and draw the managers' attention to the type of information to disclose.

To analyse the impact of financial and non-financial information on analysts' recommendations, we adopt two approaches: a qualitative one (content analysis of financial analysts' reports) and a quantitative one (logistic regression analysis). Our findings confirm the usefulness of financial information and the notorious emergence of non-financial information. These results, obtained on the Tunisian market, could have important implications for other countries in the MENA region. Unlike the widely analysed American or European markets, the markets in this region are little examined.

This paper is structured as follows. We start by performing a literature review on the determinants of the analysts' recommendations. Then we present the qualitative approach conducted to assess the impact of financial and non-financial information on these recommendations. Finally, we expose the quantitative analysis run to quantify this impact. By way of conclusion, we suggest extensions likely to enrich this research.

2 Determinants of financial analysts' recommendations

Recommendations of financial analysts generally take five forms: strong buy, buy, hold, sell, and strong sell. According to the literature, both the intrinsic characteristics of the firm and the country's economic situation influence these recommendations.

2.1 Company's characteristics

Two types of information reflect a company's characteristics: financial and non-financial. According to Orens and Lybaert (2013) and Tan et al. (2019), financial information can be obtained from financial statements and is generally quantitative. In contrast, non-financial information is qualitative and found outside the financial statements. The first type of information is verifiable and objective. Conversely, the second one is subjective.

Previous researchers agree that firms whose stocks are likely to be recommended for holding or buying are low levered, announcing dividend payment, benefit realising or forecasting, pushing analysts to up-ward revise their forecasts, and engaging in R&D projects (Finger and Landsman, 2003; Pech et al., 2015; Choi and Kim, 2017; Pazarzi and Sorros, 2018; Peasnell et al., 2018; Kumari and Mishra, 2019; Ertugrul, 2020; Chu and Zhai, 2021). These firms are considered financially safe, promising high growth prospects, and consequently attractive. In contrast to these financial characteristics, the impact of the Free Cash Flow (FCF) is not evident. It seems, according to Jensen and Meckling (1976), Jensen (1986), Schmidt and Fowler (1990), and Lambert et al. (1991), that this impact depends negatively on the extent of the conflict of interest between managers and stakeholders. In case of minor conflict, the FCF reflects the company's financial health, performance, and attractiveness. Notwithstanding the direction of the impact of the factors cited above, financial information would still be relevant for analysts' recommendations (*Hypothesis 1*).

The growing importance of non-financial information in recent years (Khasharmeh and Suwaidan, 2010; Stolowy and Paugam, 2018; Lister et al., 2020) leads to another stream of research examining the relevance of this set of information for analysts' recommendations. Firms with favourable information on growth perspectives, management and strategy, social responsibility commitment, and market conditions should be, accordingly, recommended for buying or holding because they promise growth prospects and benefit from a good reputation and recognition (Breton and Taffler, 2001; Jegadeesh et al., 2004; Jung et al., 2012; Mustafa et al., 2012; Duqi and Torluccio, 2013; Njaya, 2014; Brown et al., 2015; Stekelenburg et al., 2015; Togun and Nasieku, 2015; Rodriguez-Fernandez, 2016; Peasnell et al., 2018; Alazzani et al., 2021; Wan-Hussin et al., 2021). In line with these studies, non-financial information seems useful for analysts when producing their recommendations (*Hypothesis 2*).

2.2 Country's economic situation

When assessing the relative importance of financial and non-financial information, Breton and Taffler (2001) conclude that the first one is neither predominant nor solely used information by analysts. Both pieces of information are relevant. In periods of economic distress and uncertainty, Tan et al. (2019) show that, although analysts use non-financial information more frequently, they consider financial information the most important because it is easily verifiable by investors. They also show that analysts tend to use jointly non-financial information because it enables them to add positivity to the financial figures, especially in bad times (Barker and Imam, 2008). Moreover, it allows them to justify their optimism when they advise unexpectedly to buy or hold stocks instead of selling.

Tunisian firms went through severe downturns due to the multidimensional crisis that hardly hit the country in the past decade. Indeed, following the Jasmine Revolution of

2011, Tunisia has made significant political improvements in building a democratic State. However, the political and social instability recorded after the revolution has led to an economic collapse. According to the IMF website, the average GDP growth between 2000 and 2010 was nearly 4%. However, between 2011 and 2019, the country experienced a rapid decline in this growth that led to only 1.8%. Subsequently, the situation worsened with the COVID-19 pandemic that marked the period 2019–2021. The decline in growth affected almost all sectors of the economy. The financial authorities resorted to borrowing to cope with the drop in income and the increase in public expenditure. The public debt, which in 2010 represented 43.4% of GDP, rose to 82% in 2021. What deepens the problem is that the State used these loans mainly to cover current expenditures instead of investing in developmental projects. In addition, the rise in inflation (3.5% in 2010 vs. 6.6% in 2021) and unemployment (13% in 2010 vs. 14.9% in 2021) weakened the Tunisian economy further.

Since the period that we study, i.e., from 2015 to 2020, is concerned with the economic crisis, we postulate as Tan et al. (2019) that analysts would use non-financial information when issuing favourable recommendations, i.e., buy or hold (*Hypothesis 3*).

3 Content analysis

To explore the determinants of Tunisian financial analysts' recommendations, we first analyse the content of their research reports. We present below the methodology of this analysis. Then, we interpret the results obtained.

3.1 Methodology

The content analysis consists of three stages: sample and data selection, corpus preparation, and analysis of the collected data. Ensuring data reliability and the validity of the results also requires data triangulation.

3.1.1 Sample and data selection

To identify the determinants of financial analysts' recommendations, we analyse the content of reports issued by brokerage firms. These reports reflect the fundamental information for analysts when evaluating companies (Rogers and Grant, 1997; Bradshaw, 2004).

Only the reports of 7 brokerage companies out of 22 are analysed as they contain explanations presented in a research report's form. These are Tunisie Valeurs, AFC, Amen Invest, Maxula, Alpharma, Mac-SA and BNA Capitaux. These reports are available on the TUSTEX and the cited companies' websites.

The study covers Tunisian companies listed on the stock exchange between 2015 and 2020 ($N = 88$) having at least one analyst's report ($N = 45$) and operating in the non-banking sector ($N = 36$). The banking sector is excluded mainly because of its accounting specificities.

The total sample consists of 82 analysts' reports for 36 firms split as follows: 46 (56%) buy (or strong buy) recommendations, 28 (34%) conservation recommendations (or neutral), and only 8 (10%) sell (or strong sell) recommendations. Unlike buy recommendations, which are the most frequent, sell ones are relatively rare. As stated in

the signalling theory, to maintain good relations with customers, analysts tend to formulate optimistically biased recommendations (Lim and Kim, 2019).

3.1.2 Corpus preparation

This step includes data transcription and pre-analysis. Data transcription consists of listing and writing in text mode the information collected. It aims to reduce the content of the reports and facilitate their analysis. The texts obtained represent the corpus of the study. We exclude tables in analysts' reports because the key factors that justify the stock recommendation take, in general, a textual narrative form.

The financial analysts' recommendations are of five types: strong buy, buy, hold, sell, and strong sell. To facilitate the textualisation of the collected data, we combine the analysts' reports into three groups: those recommending buying or strong buying stocks (group 1), those issuing hold or neutral recommendations (group 2), and those recommending selling or strong selling stocks (group 3). Bird et al. (2004) and Brown and Huang (2013) did this combination.

The pre-analysis aims to define the keywords of the study, categorise them into themes, and classify the analysts' reports in these themes according to the attitude indicators (Weber, 1990). Previous studies (Breton and Taffler, 2001; Tan et al., 2019), as well as the in-depth reading process of analysts' reports, lead us to develop a keywords dictionary by identifying 57 keywords (Financial: 26, Non-financial: 31). The most common meaning of the word and prior studies enable us to easily classify keywords into five thematic categories: financial position, profitability, growth, management & strategy, competitive position & market conditions (Table 1). The two first themes include financial information. The three others represent non-financial information.

Table 1 Keywords categorisation

Categories	*Themes*	*Keywords*
Financial information	Financial position	Debt; Cash-flow; Share price; Dividend; Capital; Actual figures; Gearing; Financing; Stability; Equity; Financial situation; Financial structure; Research and development expenditures; Free Cash-Flow
	Profitability	Turnover; Profit; Earnings; Margin; Revenues; EBITDA; EBIT; EBE; Cost; Expenses; Performance; Loss; Earnings' forecast; Stock return
Non-financial information	Growth	Growth; Investment; Development; Bid; Merger; Research and Development
	Management and strategy	Management; Strategy ; Project; Brand; Opportunities and threats; Control; Company Social Responsibility; Productivity; Restructuring
	Competitive position & Market conditions	Leader; Competitiveness; Market; Product; Sales; Production; Positioning; Subsidiaries; Competition; Market share; Volume; Consumption; Purchase; Customers; Demand; Supply

These themes can take three forms: positive, neutral, or negative. These attitude indicators lead us to split each thematic category into three directional arguments. In

summary, our study provides 15 thematic variables, following the structure presented in Table 1.

3.1.3 Data analysis

To extract the information from the textual corpus, we conduct two analyses. We first excerpt concepts such as words or a set of words that occur in this corpus. This analysis is easy to automate by running a qualitative data analysis (QDA) and using software procedures. The QDA consists of four steps:

- identification of the keywords found in each analysed report (Coding)
- classification of each keyword in the appropriate predefined theme (Categorisation). As per Tan et al. (2019), we combine synonyms for keywords "to make the analysis more comprehensive"
- segregation of each keyword and its classification in the adequate thematic variable according to attitudinal indicators (positive, negative, and neutral)
- determination of the frequency of each thematic variable by dividing the number of keywords occurrences in the thematic variable by the total number of keywords occurrences in the text (Breton and Taffler, 2001). We assume that the number of word occurrences is proportional to its importance (Frequency).

However, the presence of keywords alone may not be sufficient to locate meaning. Analysts can indeed use the same word to denote different meanings. For this reason, we conduct a second analysis based on an implicit concept. An explicit-implicit approach admits richer meanings and locates their frequency. Since it is more difficult to resort to computers, we multiply human coders to reduce subjectivity (Carley, 1990).

3.1.4 Data triangulation

To achieve data reliability and results' validity, we run two forms of triangulation. The first form consists in collecting data from multiple sources (Denzin, 1970). For this reason, we retain, for the same company, the reports issued by distinct financial analysts. The latter can belong to the same brokerage company as they can operate in different ones. The second form of triangulation requests varying analysis methods when collecting data. We analyse our data both in manual and computerised ways. We use the SPHINX software specially designed to analyse texts automatically.

Manual analysis is sometimes necessary, not only as a triangulation tool but to replace SPHINX software when it does not perform effectively. This concerns, in particular, the counting of compound keywords, words appearing with several synonyms, and those requiring context consideration (Clatworthy and Jones, 2003; Barker and Imam, 2008; Tan et al., 2019).

3.2 Results

Tables 2 and 3 provide information about the frequency of use of keywords, themes, and thematic variables in the financial analysts' recommendations.

Table 2 Financial and non-financial keywords by type of recommendation

Financial keywords	*Buy*		*Hold*		*Sell*		*Nonfinancial keywords*	*Buy*		*Hold*		*Sell*	
	N	*%*	*N*	*%*	*N*	*%*		*N*	*%*	*N*	*%*	*N*	*%*
Turnover	155	5.41	63	5.55	3	1.60	Strategy	260	9.08	61	5.37	4	2.14
Profit	138	4.82	50	4.41	9	4.81	Market	245	8.56	71	6.26	13	6.95
Result	105	3.67	43	3.79	17	9.09	Growth	142	4.96	54	4.76	3	1.60
Margin	100	3.49	50	4.41	10	5.35	Product	122	4.26	56	4.93	3	1.60
Debt	75	2.62	52	4.58	2	1.07	Investment	107	3.74	45	3.96	2	1.07
Cash-flow	69	2.41	26	2.29	7	3.74	Sales	76	2.65	39	3.44	17	9.09
Revenues	67	2.34	34	3.00	5	2.67	Production	71	2.48	24	2.11	3	1.60
Share price	61	2.13	5	0.44	0	0.00	Management	63	2.20	46	4.05	7	3.74
EBITDA. EBIT. EBE	51	1.78	24	2.11	4	2.14	Positioning	61	2.13	10	0.88	1	0.53
Cost	44	1.54	15	1.32	7	3.74	Project	56	1.96	30	2.64	2	1.07
Dividend	43	1.50	20	1.76	1	0.53	Development	50	1.75	25	2.20	0	0.00
Capital	42	1.47	25	2.20	3	1.60	Brand	44	1.54	7	0.62	0	0.00
Expenses	40	1.40	30	2.64	6	3.21	Competition	39	1.36	21	1.85	6	3.21
Performance	40	1.40	9	0.79	0	0.00	Market share	39	1.36	15	1.32	2	1.07
Loss	36	1.26	12	1.06	17	9.09	Volume	35	1.22	10	0.88	3	1.60
Actual figures	27	0.94	6	0.53	2	1.07	Leader	32	1.12	11	0.97	0	0.00
Gearing	26	0.91	12	1.06	1	0.53	Consumption	24	0.84	8	0.70	0	0.00
Earnings' forecast	25	0.87	6	0.53	3	1.60	Competitiveness	23	0.80	3	0.26	1	0.53
Financing	21	0.73	17	1.50	1	0.53	Opportunities and threats	21	0.73	4	0.35	1	0.53

Table 2 Financial and non-financial keywords by type of recommendation (continued)

Financial keywords	*Buy*		*Hold*		*Sell*		*Nonfinancial keywords*	*Buy*		*Hold*		*Sell*	
	N	*%*	*N*	*%*	*N*	*%*		*N*	*%*	*N*	*%*	*N*	*%*
Stability	17	0.59	14	1.23	0	0.00	Acquisition	21	0.73	9	0.79	1	0.53
Equity	12	0.42	11	0.97	4	2.14	Subsidiaries	19	0.66	5	0.44	2	1.07
Financial situation	9	0.31	5	0.44	0	0.00	Customers	17	0.59	3	0.26	2	1.07
Financial structure	7	0.24	4	0.35	2	1.07	Control	14	0.49	13	1.15	1	0.53
Stock return	5	0.17	5	0.44	2	1.07	Company Social Responsibility	14	0.49	5	0.44	0	0.00
Free Cash-Flow	2	0.07	0	0.00	0	0.00	Demand	14	0.49	5	0.44	6	3.21
Research and development expenditures	0	0.00	0	0.00	0	0.00	Productivity	12	0.42	3	0.26	0	0.00
							Supply	10	0.35	1	0.09	0	0.00
							Research and development	6	0.21	4	0.35	0	0.00
							Restructuring	6	0.21	4	0.35	1	0.53
							Bid	3	0.10	2	0.18	0	0.00
							Merger	0	0.00	3	0.26	0	0.00
Total	1217	42.51	538	47.40	106	56.68	Total	1646	57.49	597	52.60	81	43.32

To each batch of research reports considered separately: N is the number of occurrences of the keyword, % is the percentage of occurrences of the keyword divided by the number of occurrences of all keywords belonging to the same category: Financial or non-financial.

Table 3 Mean theme by type of recommendation (%) and according to their attitudinal indicators

	Buy		*Hold*		*Sell*	
Theme	*N*	*%*	*N*	*%*	*N*	*%*
Financial position	411	14.36	197	17.36	23	12.30
Positive		**10.62**		**11.54**		**0.00**
Negative		1.54		4.05		8.02
Neutral		2.20		1.76		4.28
Profitability	806	**28.15**	341	**30.04**	83	**44.39**
Positive		**24.20**		**22.20**		0.00
Negative		1.78		6.08		**34.76**
Neutral		2.16		1.76		9.63
Growth	308	10.76	133	11.72	5	2.67
Positive		**8.31**		**8.11**		0.00
Negative		1.08		2.20		2.67
Neutral		1.36		1.41		0.00
Management & Strategy	490	17.11	173	15.24	16	8.56
Positive		**12.33**		**8.99**		0.00
Negative		1.95		5.11		5.35
Neutral		2.83		1.14		3.21
Competitive position & Market conditions	848	**29.62**	291	**25.64**	60	**32.09**
Positive		**21.72**		**15.68**		0.00
Negative		2.41		7.31		**23.53**
Neutral		5.48		2.64		8.56
Total	**2863**	**100**	**1135**	**100**	**187**	**100**

N is the number of occurrences of keywords belonging to the same theme; % is the percentage of occurrences of keywords belonging to the same theme, divided by the number of occurrences of all keywords, themes combined.

3.2.1 Keywords

Table 2 shows the breakdown of financial and non-financial keywords used by analysts in each type of recommendation. For buy and hold recommendations, non-financial words are more frequent (57.49% and 52.60%) than financial ones (42.51% and 47.40%). The most used non-financial terms are Strategy, Market, Growth, and Product, while the most frequently mentioned financial keywords are Turnover and Profit. Conversely, for sell recommendations, financial words are more frequent (56.68%) than non-financial ones (43.32%). The former includes Results and Losses. The latter covers Sales and Market.

Concerning financial information, references to Result, Margin, EBIT, and EBITDA, are frequent in all reports. They represent 8.94%, 10.31%, and 16.58% of words used respectively in buy, hold and sell statements. Profitability seems crucial for the analyst when formulating his recommendations. The word Profit appears more often than its

opposite Loss in buy and hold recommendations and vice versa in sell recommendations. Analysts tend to recommend buying or holding securities of profitable firms and selling those of unprofitable ones.

Regarding the leverage level of the firm, the words Debt and Gearing seem to be influential, first for hold recommendations, then for buy, and finally for sell ones. Together, they represent 5.64%, 3.53%, and 1.6% of words used in the three types of reports.

The term Dividend is quite common in buy and hold recommendations (1.5% and 1.73% respectively). But, it represents only 0.53% of words used in sell recommendations. Firms concerned by unfavourable advice pay little or no dividends. In addition, the expression Earnings forecast represents only 0.87%, 0.53%, and 1.60% of words used in the three types of reports. This weak occurrence infers that this information is trivial for Tunisian analysts. Two observations reinforce this assertion. First, an in-depth reading of analysts' reports referring to this expression shows that this latter appears only once per report. We conclude that the few analysts who mention this word do it slightly. Second, the number of brokerage houses that disclose earnings forecasts for listed firms shows that only two companies out of 22 provide these forecasts. The others, not yet being convinced of their informational usefulness, abstain from producing them.

Information concerning Research and Development expenditures does not appear in any report. The Free cash-flow expression, supposed to reflect agency costs between shareholders and managers, seems not to affect the recommendations of financial analysts. It represents only 0.07% of used words in buy reports and appears neither in hold nor sell reports. Instead, these reports underline a lack of liquidity problem. Indeed, 7 out of the 28 hold reports and 4 out of 8 sell reports cite this issue.

Regarding non-financial information, it appears that the term Market is at the forefront of keywords used by analysts. It covers 8.56%, 6.26%, and 6.95% of words included in buy, hold, and sell reports. Market conditions, reflected in the terms: Market, Opportunities & threats, Competition, Demand, and Supply, count 11.49%, 9.34%, and 13.9% of the total words. The company's position in the market, approached by the terms Positioning, Competitiveness, Sales, and Market share, represents almost 7%, 6%, and 11% of the total words. These results reveal that the market and the company's competitiveness information precede the other available data.

The word Strategy is ranked first for buy recommendations (9.08%) and third for hold ones (5.37%). It is relatively less relevant for sell recommendations (2.14%). A deep manual analysis shows that in almost 35% of buy and hold reports, the Strategy keyword is referred to by analysts to justify an unexpected recommendation. Indeed, when the company's profitability is negative or decreasing, analysts should produce sell recommendations, which reflect their distrust and pessimism. However, of the 46 buy and 28 hold reports, there are respectively 16 and 10 reports that experience profitability issues. Analysts explain this surprising finding through the health and economic crises encountered in recent years. Even if these crises weaken companies and tip them into precariousness and blues situations, analysts consider their effects transitory, especially for companies that implement effective strategies. For these firms, analysts justify their optimism by expected long-term gains of a successful implementation that offset short-term recorded lack of profitability.

The word Management is also frequent in analysts' reports. It accounts for more than 2% of words used in buy reports and nearly 4% of terms used in hold and sell reports. The company's quality of management, therefore, drives analyst recommendations.

However, the expression Corporate Social Responsibility is very rare. It accounts for less than 0.5% of used words in buy and hold reports. It does not appear in sell reports. Out of 2863 words counted in buy reports, it appears only 14 times. Also, out of 1135 words counted in hold reports, it appears uniquely 5 times. Yet we note that, over the study period, the expression CSR is mentioned 10 times out of 14, in 2020. This confirms the growth of this concept in recent years and the increased companies' awareness to adopt a socially responsible approach. To legitimate their activities and raise their resilience in a complex and increasingly turbulent environment, some companies have started disclosing information on this topic.

Additionally, the word Growth is frequent for buy (4.96%) and hold (4.76%) recommendations because it means future gains. But, it is relatively rare to sell ones (1.6%). Firms subject to such advice generally experience negative growth rates, reflected in more directly informative financial data, especially Result or Loss.

Finally, the non-financial expression related to Research and Development accounts only for 0.21%, 0.35%, and 0% of words used in buy, hold, and sell recommendations, respectively. The small investment of Tunisian companies in Research and Development can explain these low occurrences. To encourage such activities, the Tunisian regulator has introduced, in 2022, an incentive tax measure. This latter allows companies that satisfy the requirements specified in article 21 of the 2022 Finance Law to deduct an additional amount of 50% on incurred Research and Development expenses.

To sum up, non-financial information appears preponderant for buy and hold recommendations because it is subjective and malleable. In contrast, thanks to its objectivity and verifiability nature, financial information is the foremost input for sell recommendations. Information on research and development expenditures, free cash flow, and corporate social responsibility, almost missing in analysts' reports, are therefore ignored in the quantitative analysis.

3.2.2 Themes

Table 3 provides information on the importance of themes by type of recommendation. It shows that Profitability, Competitiveness & Market conditions are the most important themes. Financial position, Growth, and Management & Strategy are also informative for analysts, but to a lower degree.

The Financial position does not present substantial differences between the types of recommendations. However, Growth, Management & Strategy tend to have a noticeable impact on the analysts when advising to buy and hold stocks, but little or no impact when advising to sell stocks. When issuing unfavourable recommendations, analysts seem to take little interest in information about the management and strategy of the company (8.56%) and even less in those providing information on its growth opportunities (2.67%). The profitability of the company and its position in the market are the most appealing information for them.

3.2.3 Thematic variables

According to Table 3, buy and hold recommendations seem to concern firms that are profitable, competitive on the market, well managed, in good financial health, and with high growth prospects. On the contrary, sell recommendations seem to be formulated for

unprofitable firms, weak in the market, financially unbalanced, poorly managed, and without growth potential.

From the preceding discussions, we can conclude that the five themes affect analysts' recommendations. Among financial ones, information on profitability seems more important than its counterpart relating to financial position. Indeed, 28.15%, 30.04%, and 44.39% of words counted in buy, hold, and sell reports provide information on companies' profitability. But, only 14.36%, 17.36%, and 12.30% are related to their financial position.

The theme Market conditions & company competitiveness ranks first among the non-financial themes. It represents nearly 30% of the total words cited. It takes precedence over Growth and Management & Strategy themes, which fail to reach this rate together.

For buy and hold recommendations, non-financial information outranks financial one. However, for sell recommendations, financial information remains predominant. This predominance is imputable to the economic crisis that strongly marked the period under study. In times of crisis, the Tunisian analyst seems to use non-financial information to hide a dissuading reality displayed, for some companies, by financial data. Non-financial information allows it to keep up some optimism to ensure investors and motivate them to buy risky stocks. Thus, it guarantees some dynamism and activeness needed to ensure the financial market equilibrium in an unstable context. Seen in this light, a Tunisian financial analyst acts as a resuscitator that boosts a struggling market. Instead of serving his clients honestly and transparently, he protects market interests and supports the global economy. This finding is inconsistent with Tan et al. (2019) conclusion that advances financial information because it is objective and allows investors to verify analysts' recommendations' validity.

To confirm these proposals, we assess in what follows the impact of these themes through a quantitative analysis.

4 Logistic regression analysis

Since our dependent variable, i.e., the financial analysts' recommendations, is qualitative, we identify its determinants by running a logistic regression analysis. The explanatory variables are continuous and categorical and encompass all themes identified by the content analysis. We appreciate the financial position theme by both the leverage level of the firm and the dividend. Actual earnings, earnings forecast, and the difference between these two earnings measure the profitability theme. The firm's growth is proxied by the sales growth rate. The categorical variables include the Management & Strategy theme, measured by a dummy variable reflecting whether the company adopted a new strategy or not. Moreover, they incorporate the Competitive position & Market conditions theme, estimated by the market leader status.

4.1 Methodology

4.1.1 Analysts' recommendations metric

The financial analysts' recommendations are generally categorised on a five-point scale, ranging from Strong Buy to Strong Sell: 5-Strong buy, 4-Buy, 3-Hold, 2-Sell, 1-Strong sell. Finding that some recommendations are similar, authors such as Bird et al. (2004)

and Brown and Huang (2013) combine strong buy and buy ones into a single Buy modality and sell and strong sell recommendations to produce the Sell rating. They retain three categories coded as 5 (Buy), 3 (Hold), and 1 (Sell). We adopt the second classification for at least two reasons. First, the log odds ratio represents the base of our econometric model. It reflects the choice between two modalities that are assumed to be non-substitutable. Second, in Tunisia, most of the recommendations refer to this classification.

A company may be followed by many financial analysts and be subject to different recommendations. The literature suggests aggregating the various recommendations produced into a single one, called Consensus analyst recommendation. This aggregation aims to formalise the degree of agreement between analysts and is equal to the average of the recommendations issued during a given period '*t*' for a company '*i*' (Jegadeesh et al., 2004; Cheng et al., 2006).

To determine the level of the annual consensus associated with each firm *i* during year *t* (REC_{it}), we first assign a rating to each recommendation (5 for Buy, 3 for Hold, and 1 for Sell). Then, we calculate the score of each firm i during year t. This score corresponds to the sum of ratings obtained by all recommendations divided by the number of analysts following it. Finally, we use the score of each firm to estimate its consensus recommendation. Following Bird et al. (2004), for buy consensus, the score is greater or equal to 3.5. For hold consensus, it is between 2.5 and 3.5. Finally, for sell consensus, it is lower than 2.5.

4.1.2 Estimation models

As consensual recommendation (dependent variable) can take three forms, and we collected it for each firm-year observation, we should use a multinomial logistic regression model with Panel Data. However, since we cannot perform the estimation of such a model by econometric software, we opt for a binary logistic regression model with Panel Data.

We test four binary logistic regression models: A, B, C, and D. In Model A, we combine hold and sell recommendations to examine the effect of the explanatory variables on the probability of advising to buy rather than to hold or sell stocks. In Model B, we combine buy and hold recommendations. Thus, we explore the determinants of recommending to sell rather than buy or hold stocks. Model C analyses the determinants of choosing a hold vs. a buy recommendation. Model D investigates the factors affecting the choice between advising to maintain or sell stocks. Models C and D ignore sell and buy advice, respectively.[1]

The binary logistic model is written as follows:

$$
\begin{aligned}
Log\frac{P(REC_{it}=1)}{P(REC_{it}=0)} &= \left(a_0^j - a_0^l\right) + \left(a_1^j - a_1^l\right) LEV_{it-1} + \left(a_2^j - a_2^l\right) DIV_{it-1} \\
&+ \left(a_3^j - a_3^l\right) EPS_{it-1} + \left(a_4^j - a_4^l\right) FEPS_{it} + \left(a_5^j - a_5^l\right) \Delta EPS_{it} \\
&+ \left(a_6^j - a_6^l\right) SGR_{it-1} + \left(a_7^j - a_7^l\right) STRAT_{it-1} + \left(a_8^j - a_8^l\right) LEAD_{it-1} \\
&+ \left(a_9^j - a_9^l\right) SIZE_{it-1} + \left(a_{10}^j - a_{10}^l\right) LIST_{it} + \left(a_{11}^j - a_{11}^l\right) COV_{it} + \varepsilon_{it}
\end{aligned}
$$

REC_{it} is a binary variable. In model A, it equals 1 for buy consensual recommendations and 0 otherwise. In model B, it equals 1 for hold recommendations and 0 otherwise. In model C, it equals 1 for hold recommendations and 0 for buy ones. In model D, it equals 1 for hold recommendations and 0 for sell ones.

LEV_{it-1}: the financial leverage of firm i for year t–1, measured as the ratio of debt (LEV_{it-1} = Net $debt_{t-1}$/Total $equity_{t-1}$).

DIV_{it-1}: the percentage of dividends received by shareholders of firm i for year t–1, measured as the dividend payout ratio (DIV_{it-1} = Total amount of dividends paid to $shareholders_{t-1}$/Net $income_{t-1}$).

EPS_{it-1}: the earnings per share of firm i in year t–1, measured as the company's profit divided by the average number of outstanding shares.

$FEPS_{it}$: the consensus earnings forecasts of firm i in year t calculated as the average of the analysts' forecasts of the annual earnings.

ΔEPS_{it}: the difference between the realised annual earnings and the consensus earnings forecast scaled by the realised annual earnings (ΔEPS_{it} = Consensus earnings forecast EPS_t – Realised EPS_{t-1})/ Realised EPS_{t-1}). This variable is added to the model and used as a proxy of the analyst optimism.

SGR_{it-1}: the sales growth of the firm i in year t–1 measured by the percentage change in sales.

$STRAT_{it-1}$: a dummy variable that equals 1 if firm i adopts a new strategy during year t–1 and 0 otherwise.

$LEAD_{it-1}$: a dummy variable that equals 1 if firm i is the leader in its sector in year t–1 and 0 otherwise.

$SIZE_{it-1}$: the logarithm of the market capitalisation of firm i at the end of the year t–1.

$LIST_{it}$: the listing age of firm i since its IPO until year t.

COV_{it}: the number of financial analysts covering firm i in year t.

SIZE, LIST, and COV are inserted in the models as control variables.[2]

4.1.3 Sample, data and descriptive statistics

The study focuses on Tunisian companies listed on Tunis Stock Exchange, whose initial number is 88. We remove banks due to their specific regulations. Their number is 13. Of the remaining 75 companies, we exclude six because of data unavailability. The final sample includes 69 companies observed over six years (from 2015 to 2020). During this period, these companies were followed by at least one brokerage company and possess recommendations data. We eliminate the period before 2015 due to the lack of data relating to recommendations and earnings forecasts.

During the period under study, out of the 22 stock market intermediaries operating in Tunisia, only 7 issued at least one recommendation for at least one company retained in the final sample. As these data are crucial for the study, we eliminate all intermediaries who have not fulfilled this condition. To sum up, only seven stock brokers are selected.

Over the study period, they issued 395 recommendations: 54% Buy, 26% Hold, and 20% Sell.

We collect data about analysts' recommendations and earnings forecasts from reports provided by the brokerage firms, available on their respective websites and the Tustex one. We gather the other independent variables from companies' annual reports, which are available on the Tunis Stock Exchange (BVMT) and the Financial Market Council (CMF) websites.

Table 4 reports the descriptive statistics of continuous and categorical independent variables. Panel 1 shows that buy recommendations are associated with the highest earnings, dividends, growth, and market capitalisation. Nevertheless, they are related to the lowest level of leverage. In contrast, it shows the opposite observation for sell recommendations. Hold recommendations are between buy and sell ones. They are related to lower earnings, dividends, growth, and market capitalisation than those linked to buy recommendations but higher than those associated with sell ones. Conversely, they are associated with a lower (higher) leverage than that of sell (buy) recommendations.

The listing age and the analysts' following do not seem to impact the recommended choice since these variables do not show, on average, any difference between the three types of recommendation.

The effect of the analysts' optimism contradicts our expectations concerning hold and sell recommendations. Analysts seem to recommend holding stocks for which they expect a decrease in earnings (average = –1.04%) and selling stocks for which they predict the opposite (average = 0.45%). As the effect of the level of optimism may be covered by that of the other explanatory variables, it is necessary to isolate it by running a multivariate analysis.

Financial analysts recommend buying stocks of more than half of the companies (54.43%). Panel 2 of Table 4 shows that most of these latter are market leaders and have changed their strategies. They recommend holding stocks of 26.07% of companies. Essentially, these do not have the leader status and have maintained their old plans. Stocks recommended for selling are the least numerous. They concern only 19.5% of companies. Mostly, the latter are non-leaders and have adopted new programs. The low percentage associated with sell recommendations confirms the optimistic attitude of the analyst described in the qualitative analysis presented above.

4.2 Results of multivariate analysis

Multivariate analysis based on a logistic regression model requires the independence of explanatory variables. Since the coefficients of the Shapiro-Wilk test (Panel 1 of Table 5), applied to continuous variables, are significant at the 1% level (except for SIZE), we conduct a Spearman correlation analysis. Panel 2 indicates that the correlation problem arises between EPS and FEPS (Spearman's nonparametric coefficient = 0.91). We use the Mann-Whitney test to study the correlation between continuous and categorical variables. We find evidence of a significant correlation at 5% and 1% levels between LEAD on the one hand and EPS, FEPS, and SIZE variables on the other hand. In addition, we detect a significant correlation between STRAT and ΔEPS, SIZE, and LIST variables (Panel 3). To circumvent the correlation problem, we run our model into separate regressions. We perform the Chi-2 test to assess the correlation between categorical variables. Results confirm the absence of correlation (Panel 4). In short, we analyse six combinations (CBN) of explanatory variables.

Table 4 Descriptive statistics

	Buy						*Hold*						*Sell*					
Panel 1. Continuous independent variables																		
	N	*Mean*	*Std. Dev*	*Median*	*Min*	*Max*	*N*	*Mean*	*Std. Dev*	*Median*	*Min*	*Max*	*N*	*Mean*	*Std. Dev*	*Median*	*Min*	*Max*
LEV	209	0.84	1.96	0.14	–1.02	9.65	96	1.67	2.72	0.80	–1.21	9.96	49	1.88	2.15	1.14	–0.87	8.93
DIV	215	0.62	0.31	0.65	0.00	1.88	103	0.42	0.66	0.29	0.00	5.25	77	0.13	0.29	0.00	0.00	1.11
EPS	215	1.24	2.93	0.54	–0.55	31.84	103	0.56	1.97	0.19	–8.07	7.87	77	–1.74	2.98	–0.74	–15.37	2.54
FEPS	215	1.25	2.38	0.60	–0.16	21.51	103	0.71	1.97	0.29	–7.21	9.18	77	–1.06	2.32	–0.31	–11.90	2.97
ΔEPS	215	0.48	3.05	0.09	–1.09	42.10	103	–1.04	21.16	0.16	–191	89	77	0.45	1.91	0.36	–4.33	14.86
SGR	215	0.13	0.21	0.10	–0.48	1.31	103	0.01	1.02	0.08	–9.62	2.48	77	0.02	0.67	–0.03	–1.00	5.36
SIZE	215	4.85	1.25	4.80	1.95	8.41	103	3.8	0.98	3.72	1.67	5.92	77	2.56	1.27	2.51	–0.51	6.01
LIST	215	12.11	7.95	10	1	30	103	13.04	8.36	10	1	30	77	12.79	7	15	1	29
COV	215	7.51	2.04	7	4	15	103	7.43	1.86	7	3	11	77	6.93	1.94	7	3	11

Table 4 Descriptive statistics (continued)

	Buy		*Hold*		*Sell*	
Panel 2. Categorical independent variables						
	N	*%*	*N*	*%*	*N*	*%*
LEAD: 1	115	29.11	23	5.82	34	8.61
0	100	25.32	80	20.25	43	10.89
STRAT: 1	140	35.44	48	12.15	50	12.66
0	75	18.99	55	13.92	27	6.84

LEV_{it}: the financial leverage of firm i for year t, measured as the ratio of debt (LEV_{it} = Net debt $_t$/Total equity$_t$).

DIV_{it}: the percentage of dividends received by shareholders of firm i for year t, measured as the dividend payout ratio (DIV_{it} = Total amount of dividends paid to shareholders$_t$/Net income$_t$).

EPS_{it}: the earnings per share of firm i in year t, measured as the company's profit divided by the average number of outstanding shares.

$FEPS_{it}$: the consensus earnings forecasts of firm i in year t, calculated as the average of the analysts' forecasts of the annual earnings.

ΔEPS_{it}: the difference between the realised annual earnings and the consensus earnings forecast, scaled by the realised annual earnings (ΔEPS_{it} = Consensus earnings forecast EPS_t – Realised EPS_{t-1})/ Realised EPS_{t-1}).

SGR_{it}: the sales growth of the firm i in year t, measured by the percentage change in sales.

$SIZE_{it}$: the logarithm of the market capitalisation of firm i at the end of the year t.

$LIST_{it}$: the listing age of firm i since its IPO until year t.

COV_{it}: the number of financial analysts covering firm i in year t.

EPS and FEPS are expressed in Tunisian Dinar, whereas ΔEPS, LEV, and DIV are expressed in %.

$STRAT_{it}$: a dummy variable that equals 1 if firm i adopts a new strategy during year t and 0 otherwise.

$LEAD_{it}$: a dummy variable that equals 1 if firm i is the leader in its sector in year t and 0 otherwise.

N: the number of observations. % represents to each batch of analysts' reports and each variable, the number of firms that meet the condition c (c = 1 or c = 0) compared to the total number of firms, batches combined.

4.2.1 Results of buy vs. hold/sell recommendation logit model

According to the Hausman test results (Panel 1 of Table 6), the random effects approach is more appropriate than the fixed effects one (p-value > 10%). All tested equations are significant at the 1% level (p-value of Chi-squared test < 1%). Equations (1) and (2) have the highest explanatory power since they explain more than 30% of the odds ratio. Besides, they correctly classify nearly 77% of observations. The other equations determine between 16% and 20% of the odds ratio and rightly range between 70% and 74.58% of analysed observations. Such results confirm the high explanatory power of these regressions. In line with previous studies, dividend payout rate, actual earnings, earnings forecasts per share, and competitive position significantly increase the probability of choosing a buy rather than hold or sell recommendation. Nevertheless, the level of leverage produces the opposite effect. Sales growth rate and strategy do not affect the choice between a buy and a hold or sell recommendation in any equation.

Table 5 Normality and correlation tests

Panel 1. Shapiro-Wilk test			
	W	*Z*	*P value*
LEV	0.75	9.74	0.000
DIV	0.81	9.37	0.000
EPS	0.59	11.16	0.000
FEPS	0.64	10.90	0.000
ΔEPS	0.11	13.05	0.000
SGR	0.33	12.39	0.000
SIZE	0.99	0.89	0.188
LIST	0.93	6.64	0.000
COV	0.97	4.96	0.000

Panel 2. Spearman Matrix									
	LEV	*DIV*	*EPS*	*FEPS*	*ΔEPS*	*SGR*	*SIZE*	*LIST*	*COV*
LEV	1								
DIV	–0.37	1							
EPS	–0.38	0.39	1						
FEPS	–0.36	0.39	**0.91**	1					
ΔEPS	0.15	–0.03	–0.39	–0.12	1				
SGR	–0.00	0.06	0.22	0.23	–0.03	1			
SIZE	–0.16	0.28	0.44	0.44	–0.13	0.16	1		
LIST	–0.02	–0.02	0.27	0.27	–0.17	–0.07	0.08	1	
COV	–0.03	0.00	0.08	0.05	–0.04	0.07	0.10	0.1	1
Panel 3. Mann–Whitney test									
STRAT	0.99	–0.21	0.08	–0.51	**–2.03****	–0.77	**–2.25****	**2.62*****	0.47
LEAD	0.59	–1.35	**–2.68*****	**–2.43****	0.42	0.41	**–5.97*****	0.99	–1.05

Table 5 Normality and correlation tests (continued)

Panel 4. Chi–2 test		
	STRAT	LEAD
STRAT	1	
LEAD	0.29	1

LEV_{it-1}: the financial leverage of firm *i* for year *t*–1, measured as the ratio of debt (LEV_{it-1} = Net debt $_{t-1}$/Total equity$_{t-1}$).

DIV_{it-1}: the percentage of dividends received by shareholders of firm *i* for year *t*–1, measured as the dividend payout ratio (DIV_{it-1} = Total amount of dividends paid to shareholders$_{t-1}$/Net income$_{t-1}$).

EPS_{it-1}: the earnings per share of firm *i* in year *t*–1, measured as the company's profit divided by the average number of outstanding shares.

$FEPS_{it}$: the consensus earnings forecasts of firm *i* in year *t*, calculated as the average of the analysts' forecasts of the annual earnings.

ΔEPS_{it}: the difference between the realised annual earnings and the consensus earnings forecast, scaled by the realised annual earnings (ΔEPS_{it} = Consensus earnings forecast EPS_t – Realised EPS_{t-1})/ Realised EPS_{t-1}).

SGR_{it-1}: the sales growth of the firm *i* in year *t*–1, measured by the percentage change in sales.

$STRAT_{it-1}$: a dummy variable that equals 1 if firm *i* adopts a new strategy during year *t*–1 and 0 otherwise.

$LEAD_{it-1}$: a dummy variable that equals 1 if firm *i* is the leader in its sector in year *t*–1 and 0 otherwise.

$SIZE_{it-1}$: the logarithm of the market capitalisation of firm *i* at the end of the year *t*–1.

$LIST_{it}$: the listing age of firm *i* since its IPO until year *t*.

COV_{it}: the number of financial analysts covering firm *i* in year *t*.

EPS and FEPS are expressed in Tunisian Dinar, whereas ΔEPS, LEV, and DIV are expressed in %.

*, **, *** indicate that the variable is significant at 10%, 5% or 1% level, respectively.

The odds ratio is impacted by control variables differently. It increases with the company's size (Models 1 and 2). Inversely, it decreases with its listing age. Finally, it remains insensible to analyst coverage.

Financial and non-financial variables influence the choice of a buy rather than hold or sell recommendation. This result corroborates our qualitative analysis proposals that financial information is conspicuous for analysts but remains sketchy. It needs to be supplemented with non-financial ones, especially when analysts have to legitimate issuing unpredictable favourable recommendations in a context of distress. We validate, therefore, hypotheses 1, 2, and 3 for buy recommendations.

4.2.2 Results of sell vs. buy/hold recommendation logit model

We estimate all equations (except the third one) with the random effect model since the coefficients of the Hausman test are insignificant (Panel 2 of Table 6). Equations (1), (2), (5), and (6) are the most significant. The p-values of their Chi-squared statistics are lower than 1%. They globally explain more than 30% of the odds ratio and rightly classify approximately 90%. Equation (4) is significant at the 5% level. It explains almost 24% of

the odds ratio and correctly classifies roughly 87.5% of analysed observations. However, equation (3) is not significant. It determines only 15.5% of the odds ratio and correctly classifies 87% of considered recommendations.

The probability of choosing a sell rather than a buy or hold recommendation seems to decrease substantially when the company's dividend payout and the actual or forecasted earnings increase. The higher these variables are, the less the analyst tends to deliver a sell recommendation and the more he tends to produce a buy or a hold recommendation.

The gap between actual earnings and earnings forecasts per share is not significant. The analyst, therefore, seems to favour these two types of information rather than their difference when formulating sell recommendations. Similarly, leverage level, sales growth, strategy, and competitive position are insignificant.

The control variables: SIZE and COV, significantly and negatively impact the probability of choosing a sell recommendation. The larger the company is and the more it is followed by analysts, the less the analyst tends to recommend its stocks for selling. The company's listing age does not appear to affect the choice of a sell recommendation.

These very striking findings suggest that for sell recommendations, the analyst only uses financial information, i.e., the dividend (financial situation mirror) and the earnings per share (performance mirror). However, it does not use any non-financial information. Neither growth, strategy, nor market conditions seem to hold his attention. Financial figures provide him with comprehensive data to determine, with complete conviction, the fate of firms' stocks, suffering from poor financial health and weak or no performance. We only validate hypothesis 1 for sell recommendations.

4.2.3 Results of hold vs. buy recommendation logit model

Panel 3 of Table 6 shows that the odds ratio is positively associated with the leverage level but negatively with dividend, actual and forecasted earnings per share, strategy, and competitiveness. These results agree with previous studies arguing that leverage increases the probability of choosing a hold rather than a buy recommendation. On the contrary, dividends, and actual or forecasted earnings, lower the tendency to favour a hold instead of a buy recommendation. Also, the analyst tends less to issue a hold recommendation for firms that change strategy and have a strong market position. These results confirm our general belief that when the company is in a favourable situation, its attractiveness and market lust increase. As to the control variables, analysts seem to recommend stocks of larger companies for buying rather than holding. In contrast, they tend to recommend conserving the stocks of firms with a higher listing age. Finally, they disregard the number of analysts following the firm when issuing hold recommendations.

4.2.4 Results of hold vs. sell recommendation logit model

Panel 4 of Table 6 reveals two significant determinants of the probability of choosing a hold recommendation instead of a sell one. Exclusively, the actual and the forecasted earnings per share are decisive. They increase the odds ratio, suggesting that the more the company is profitable, the more probable the analyst recommends holding rather than selling its stocks. This result agrees with the idea that prosperous firms arouse the interest of both analysts and investors because they generate current and future gains. In contrast, unprofitable firms are disadvantageous. So, analysts advise getting rid of their stocks, without delay, by issuing sell recommendations.

Table 6 Models estimation

$$Log\frac{P(REC_{it}=1)}{P(REC_{it}=0)}=\left(a_0^l-a_0^l\right)+\left(a_1^l-a_1^l\right)LEV_{it-1}+\left(a_2^l-a_2^l\right)DIV_{it-1}+\left(a_3^l-a_3^l\right)EPS_{it-1}+\left(a_4^l-a_4^l\right)FEPS_{it}+\left(a_5^l-a_5^l\right)\Delta EPS_{it}$$
$$+\left(a_6^l-a_6^l\right)SGR_{it-1}+\left(a_7^l-a_7^l\right)STRAT_{it-1}+\left(a_8^l-a_8^l\right)LEAD_{it-1}+\left(a_9^l-a_9^l\right)SIZE_{it-1}+\left(a_{10}^l-a_{10}^l\right)LIST_{it}+\left(a_{11}^l-a_{11}^l\right)COV_{it}+\varepsilon_{it}$$

	Panel 1 *Model A: Buy vs. Hold/Sell*						*Panel 2* *Model B: Sell vs. Buy/Hold*					
CBN	*1*	*2*	*3*	*4*	*5*	*6*	*1*	*2*	*3*	*4*	*5*	*6*
Intercept	–7.906***	–8.253***	–0.926	–0.094	–0.699	–0.461	5.695***	6.464***		–0.845	–1.420	–0.788
LEV	**–0.341***	**–0.354****	**–0.464*****	**–0.475*****	**–0.468****	**–0.486*****	0.159	0.154	0.419	0.266	0.208	0.214
DIV	**1.288*****	**1.100****	**1.144****	**1.088****	**1.371*****	**1.183*****	–0.82	–1.233	–0.709	**–2.582*****	–1.335	**–1.967****
EPS	**0.501****				**0.701*****		**–0.807****				**–1.393*****	
FEPS		0.304				**0.504****		**–0.585****				**–0.909****
ΔEPS	0.018	0.016		0.016			0.005	0.010		0.021		
SGR	0.148	0.124	0.251	0.259	0.250	0.232	0.409	0.396	0.394	0.382	0.274	0.241
STRAT			0.348		0.608	0.386			0.618		0.584	0.68
LEAD			**1.952*****	**2.024*****					15.943	0.139		
SIZE	**2.293*****	**2.369*****					**–1.716*****	**–1.802*****				
LIST	**–0.148****	**–0.127****		–0.055			0.042	0.048		–0.004		
COV	0.039	0.401	0.072	0.079	0.046	0.053	**–0.344****	**–0.387*****	–0.225	**–0.323****	**–0.283***	**–0.325****
N	354	354	354	354	354	354	354	354	87	354	354	354

Table 6 Models estimation (continued)

$$Log\frac{P(REC_{it}=1)}{P(REC_{it}=0)}=\left(a_0^j-a_0^l\right)+\left(a_1^j-a_1^l\right)LEV_{it-1}+\left(a_2^j-a_2^l\right)DIV_{it-1}+\left(a_3^j-a_3^l\right)EPS_{it-1}+\left(a_4^j-a_4^l\right)FEPS_{it}+\left(a_5^j-a_5^l\right)\Delta EPS_{it}$$
$$+\left(a_6^j-a_6^l\right)SGR_{it-1}+\left(a_7^j-a_7^l\right)STRAT_{it-1}+\left(a_8^j-a_8^l\right)LEAD_{it-1}+\left(a_9^j-a_9^l\right)SIZE_{it-1}+\left(a_{10}^j-a_{10}^l\right)LIST_{it}+\left(a_{11}^j-a_{11}^l\right)COV_{it}+\varepsilon_{it}$$

	Panel 1 *Model A: Buy vs. Hold/Sell*						*Panel 2* *Model B: Sell vs. Buy/Hold*					
CBN	*1*	*2*	*3*	*4*	*5*	*6*	*1*	*2*	*3*	*4*	*5*	*6*
Hausman χ^2	3.22	1.73	10.00	6.01	2.63	9.43	6.09	6.89	**17.21*** **	3.49	4.23	7.06
Wald χ^2	**30.80*** **	**31.30*** **	**25.11*** **	**25.34*** **	**25.87*** **	**23.85*** **	**30.91*** **	**32.29*** **		**15.73** **	**19.16*** **	**18.15*** **
Likelihood ratio χ^2									9.82			
Log of likelihood	–137.376	–140.162	–168.038	–167.29	–160.155	–165.072	–73.359	–75.857	–26.875	–94.588	–84.834	–89.244
R^2	0.316	0.302	0.163	0.167	0.202	0.178	0.412	0.392	0.155	0.242	0.320	0.285
% of good classificati on	76.55	76.55	70.34	70.06	74.29	74.58	90.68	90.68	87.01	87.57	88.98	88.14

Table 6 Models estimation (continued)

$$Log\frac{P(REC_{it}=1)}{P(REC_{it}=0)}=\left(a_0^j-a_0^l\right)+\left(a_1^j-a_1^l\right)LEV_{it-1}+\left(a_2^j-a_2^l\right)DIV_{it-1}+\left(a_3^j-a_3^l\right)EPS_{it-1}+\left(a_4^j-a_4^l\right)FEPS_{it}+\left(a_5^j-a_5^l\right)\Delta EPS_{it}$$
$$+\left(a_6^j-a_6^l\right)SGR_{it-1}+\left(a_7^j-a_7^l\right)STRAT_{it-1}+\left(a_8^j-a_8^l\right)LEAD_{it-1}+\left(a_9^j-a_9^l\right)SIZE_{it-1}+\left(a_{10}^j-a_{10}^l\right)LIST_{it}+\left(a_{11}^j-a_{11}^l\right)COV_{it}+\varepsilon_{it}$$

	Panel 3 *Model C: Hold vs. Buy*						*Panel 4* *Model D estimation: Hold vs. Sell*					
CBN	*1*	*2*	*3*	*4*	*5*	*6*	*1*	*2*	*3*	*4*	*5*	*6*
Intercept	6.474***	6.603***	0.413	–0.386	0.113	–0.145	–5.011***	–5.464***	0.134	–0.648	–0.278	–0.645
LEV	**0.301***	**0.304***	**0.298****	**0.306****	**0.386****	**0.378****	–0.062	–0.064	–0.079	**0.301****	–0.018	–0.026
DIV	**–1.086****	**–0.908****	**–0.770***	**–0.745***	**–1.032****	**–0.854****	0.397	0.628	1.000	1.100	0.336	0.665
EPS	**–0.412****				**–0.487*****		**0.605****				**0.884*****	
FEPS		–0.215				**–0.320***		0.479				**0.614****
ΔEPS	–0.017	–0.015		–0.013			–0.004	–0.007		–0.015		
SGR	–0.615	–0.571	–0.848	–0.832	–1.020	–0.964	–0.254	–0.242	–0.194	–0.267	–0.066	–0.099
STRAT			–0.540		**–0.736***	–0.586			–0.749		–0.905	–0.961
LEAD			**–1.913*****	**–2.055*****					–1.188	–1.277		
SIZE	**–2.013*****	**–2.034*****					**1.188*****	**1.234*****				
LIST	**0.130****	**0.105****		0.042			–0.029	–0.039		0.009		
COV	–0.013	–0.009	–0.039	–0.038	–0.026	–0.026	**0.346****	**0.376*****	**0.267***	**0.301****	**0.283***	**0.300****
N	305	305	305	305	305	305	145	145	145	145	145	145
Hausman χ^2	3.20	2.30	0.05	3.62	2.19	1.58	5.74	5.24	4.12	1.79	6.26	5.52
Wald χ^2	**22.91*****	**22.30*****	**19.87*****	**19.45*****	**18.15*****	**16.88*****	**20.86*****	**21.35*****	9.04	7.89	**13.82****	**12.83****

Table 6 Models estimation (continued)

$$Log\frac{P(REC_{it}=1)}{P(REC_{it}=0)}=\left(a_0^J-a_0^I\right)+\left(a_1^J-a_1^I\right)LEV_{it-1}+\left(a_2^J-a_2^I\right)DIV_{it-1}+\left(a_3^J-a_3^I\right)EPS_{it-1}+\left(a_4^J-a_4^I\right)FEPS_{it}+\left(a_5^J-a_5^I\right)\Delta EPS_{it}$$
$$+\left(a_6^J-a_6^I\right)SGR_{it-1}+\left(a_7^J-a_7^I\right)STRAT_{it-1}+\left(a_8^J-a_8^I\right)LEAD_{it-1}+\left(a_9^J-a_9^I\right)SIZE_{it-1}+\left(a_{10}^J-a_{10}^I\right)LIST_{it}+\left(a_{11}^J-a_{11}^I\right)COV_{it}+\varepsilon_{it}$$

	Panel 3 *Model C: Hold vs. Buy*						*Panel 4* *Model D estimation: Hold vs. Sell*					
CBN	*1*	*2*	*3*	*4*	*5*	*6*	*1*	*2*	*3*	*4*	*5*	*6*
Log of likelihood	–129.782	–131.847	–148.450	–148.402	–146.703	–149.567	–62.947	–64.998	–74.552	–75.088	–68.416	–71.562
R^2	0.253	0.242	0.146	0.146	0.156	0.140	0.359	0.328	0.241	0.236	0.304	0.271
% of good classification	75.74	76.07	72.46	71.48	73.77	73.44	77.93	80.69	71.03	69.66	73.79	71.03

REC_{it} is a binary variable. In model A, it equals 1 for consensual buy recommendations and 0 otherwise. In model B, it equals 1 for sell recommendations and 0 otherwise. In model C, it equals 1 for hold recommendations and 0 for buy ones. In model D, it equals 1 for hold recommendations and 0 for sell ones.

LEV_{it-1}: the financial leverage of firm *i* for year *t*–1, measured as the ratio of debt (LEV_{it-1} = Net debt $_{t-1}$/Total equity$_{t-1}$).

DIV_{it-1}: the percentage of dividends received by shareholders of firm *i* for year *t*–1, measured as the dividend payout ratio (DIV_{it-1} = Total amount of dividends paid to shareholders$_{t-1}$/Net income$_{t-1}$).

EPS_{it-1}: the earnings per share of firm *i* in year *t*–1, measured as the company's profit divided by the average number of outstanding shares.

$FEPS_{it}$: the consensus earnings forecasts of firm i in year *t*, calculated as the average of the analysts' forecasts of the annual earnings.

ΔEPS_{it}: the difference between the realised annual earnings and the consensus earnings forecast, scaled by the realised annual earnings (ΔEPS_{it} = Consensus earnings forecast EPS_t – Realised EPS_{t-1})/ Realised EPS_{t-1}).

SGR_{it-1}: the sales growth of the firm *i* in year *t*–1, measured by the percentage change in sales.

$STRAT_{it-1}$: a dummy variable that equals 1 if firm *i* adopts a new strategy during year *t*–1 and 0 otherwise.

$LEAD_{it-1}$: a dummy variable that equals 1 if firm *i* is the leader in its sector in year *t*–1 and 0 otherwise.

$SIZE_{it-1}$: the logarithm of the market capitalisation of firm *i* at the end of the year *t*–1.

$LIST_{it}$: the listing age of firm *i* since its IPO until year *t*.

COV_{it}: the number of financial analysts covering firm *i* in year *t*.

EPS and FEPS are expressed in Tunisian Dinar, whereas ΔEPS, LEV, and DIV are expressed in %.

N: the number of observations.

*, **, *** indicate that the variable is significant at 10%, 5% or 1% level, respectively.

When he chooses a hold instead of a sell recommendation, the analyst refers wholly to the firm's performance. He neglects its financial situation, growth, market position, or strategy. With these results, we only confirm hypothesis 1. Regarding the control variables, the analyst recommends holding rather than selling stocks of larger firms and those intensively covered by analysts.

In sum, these findings suggest that financial and non-financial information influence hold recommendations as opposed to buy ones. However, only financial information is relevant when advising conserving rather than selling stocks.

5 Discussion and conclusion

This study examines the impact of financial and non-financial information on analysts' recommendations for Tunisian listed companies.

Through a content analysis of reports these analysts provide, our results underline the relevance of financial information, mainly the profitability and financial position of the company. This result is valid for the three types of recommendations. Non-financial information on growth, management & strategy, market conditions, and competitiveness is particularly appealing and outclasses financial information for buy and hold advice. Nevertheless, for sell advice, it is relatively less used by analysts and is predominated by financial figures. When these latter are notably discouraging, the analyst cannot mitigate them using non-financial information. In this case, issuing sell recommendations is systematic because financial information is so evident that it cannot open the field to many readings. Moderating it using non-financial information is not possible unless the reality is not blatant. In this case, instead of issuing a sell recommendation, the analyst prefers to adopt an optimistic behaviour by concealing the dissuasive financial facts with comforting and promising non-financial ones.

The qualitative analysis also shows that information used by analysts in American or European contexts is not necessarily relevant for Tunisian analysts. Examples include research and development expenditures, free cash flow, and corporate social responsibility.

The quantitative analysis run through binary logistic regression models highlights the usefulness of financial and non-financial information for buy and hold recommendations, but only financial type for sell ones. In particular, it reveals that the Tunisian analyst recommends buying stocks of low-debt firms, distributing dividends, reaching significant actual and forecasted profits, and being quietly strong in the market. However, he recommends selling the stocks of firms that do not distribute dividends and are unprofitable. In addition, he seems to use all variables, except the sales growth, when choosing between hold and buy recommendations. Typically, the analyst recommends buying instead of holding the stocks of companies operating in more favourable financial, managerial, and market conditions. Yet, he only cares about profitability when choosing between hold and sell advice.

Our findings are consistent with those obtained in the previous studies of Previts et al. (1994), Rogers and Grant (1997), and Tan et al. (2019). They generally lead us to conclude that despite the emergence of non-financial information, financial data revealing the profitability and financial situation have not lost their usefulness. Non-financial data, which appeared a few years ago, have not replaced financial ones published for much longer. They are used to complete financial information and allow

investors and analysts to assess the overall value of the firm they follow. The co-use of financial and non-financial information is expected in a country in times of crisis, seeking visibility, safety, and a reasonable level of optimism.

These findings have important implications for investors, firms, and accounting policymakers. The optimism of financial analysts should lead investors to recognise some bias in analyst advice and interpret it cautiously. In addition, simultaneous analyst use of financial and non-financial information should lead firms to increase the pertinence of these two types of information. If the first type is regulated and is relatively predefined, the second type is not limited. It can be enriched by following the needs of the company and its goals. Moreover, the attention paid by Tunisian analysts to financial information signals to accounting policymakers that this information has not lost its relevance. But, as non-financial information has begun to compete and increase in usefulness, improving the accounting standards to increase the quality of financial information is essential.

The principal contributions of our study are threefold. First, in contrast with earlier researchers who explored developed markets, we consider an emerging market, i.e., the Tunisian one. Second, we shed light on the determinants of recommendations issued by financial analysts in this market, which are, until now, unknown enough. Third, we run our analysis in a period of economic hardship that implies particularities in information selection.

Our conclusions are specific to the Tunisian stock exchange. It is worth exploring more emergent markets, such as those in the Middle East and North Africa region, to pinpoint their peculiarities compared to developed markets. In addition, despite its informativeness, the qualitative study based on the content analysis of reports provided by financial analysts deserves to be heightened with more methods of data collection (surveys, interviews, etc.). Another perspective for future research is to study the effect of mimetic behaviour on the issued recommendation. This question would be crucial for emerging markets, where analysts may tend to do like the others to avoid negative salience and rejection from customers, especially when issuing buy recommendations.

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Notes

[1]We analysed the determinants to choose a hold recommendation rather than a buy or sell recommendation (Model E). This model is an aggregation of models C and D. The results obtained (not tabulated) are insignificant. Indeed, in such a model, modality 0 in the odds ratio integrates two extreme and opposite recommendation categories: buy and sell. Explanatory variables affect the first category in one direction and the second category in the opposite direction. Thus, the total effect on the two combined categories turns out to be moderate and moves closer to the impact on the intermediate category, i.e., hold recommendation (modality 1).

[2]Regarding the size, for some researchers, large companies are relatively risky, leading financial analysts to prefer small ones. For others, large firms are highly profitable and deserve to be favoured. As to the listing period, the longer it is, the more efficient, visible, and attractive the company is perceived. Finally, concerning the intensity of analysts' following, some authors find that highly followed firms are strikingly captivating because they receive more positive and profitable recommendations. In contrast, other authors suggest that analyst following reduces the profitability of recommendations. For these control variables, see, for example, Barber et al. (2001), Bird et al. (2004), Conrad et al. (2006), Das et al. (2006), Ertimur et al. (2010), and Alfonso (2015).