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# Verbal Qualitative Information in the Daily "La Presse" and the Stock Performance of Tunisian Financial Companies

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**Abstract:** Relevant financial information is a central concern in the daily life of investors. However, despite the deterioration of the role of classical media channels, the written press, the latter remains an undeniable tool influencing the stock market. In this context, we have collected 1720 articles published in the newspaper the press of Tunis, during 6 years going from 2010 until 2015. In addition, we have used two dynamic models, first to test the impact of verbal qualitative information of print media on the stock returns of Tunisian financial companies and second to test the impact of stock returns on qualitative verbal information of print media. The estimation of the model is performed by the generalized method of moments (GMM) in dynamic panels, using the software STATA 12. The results of the empirical study show on the one hand, that the stock exchange of Tunis reacts positively following the publication of positive qualitative information and on the other hand the stock exchange reacts negatively following the publication of negative qualitative information. In sum, despite the deterioration of the place of the written press, we noticed following this study that the qualitative information of classic media remains relevant. Bad information published negatively affects the market and more precisely stock returns. However, it is essential to emphasize good qualitative and quantitative financial communication in the traditional media for the smooth running of the Tunisian financial market.

**Keywords:** Verbal Qualitative Information, Positive News, Negative News

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## 1. Introduction

Information outlets, including print media, have long been perceived as drivers of a healthy democracy and a dynamic society. They provide access to well-detailed and diversified information about the socio-economic state of affairs of a country, domestically and worldwide. Economic agents then should be able to count on a rich, articulated information base, feeding into in-depth consideration of politics, the economy, society, culture and current affairs in general.

Indeed, economic and financial press, which serves the interests of its editors rather than the truth, could not evade the control of financial organizations. The latter have a daily interest in providing investors with reliable, relevant and comprehensive financial information.

Depoers noted that public financial information is often understood as all accounting and more broadly financial information disseminated by listed companies [5]. Moreover, Monin defined exogenous information as information coming from outside the financial market but affecting stock prices [3].

This set of information contains all public information about economic fundamentals, economic and financial news of firms, political information (strikes, social movements), and information provided by the media.

Certainly, the primary medium of disseminating financial information is print media. The literature on exogenous information, or more specifically what is known as semi-strong efficiency literature, has mainly focused on a specific event affecting a set of companies. This restrictive analytical framework cannot jointly examine the effect of all exogenous information on a particular company.

However, the effect of exogenous information depends on its content. The first relevant line of research on this topic dates back to the 1960s. For instance, Ball and Brown distinguished between good and bad news, which represent an expected rise or fall in share prices [2]. Later, many studies have distinguished good and bad news following different event announcements.

Tetlock found that market reactions to company-specific public information could explain a larger portion of the

remaining 79% of the variation in stock returns [14]. Roll examined 96 large US companies publishing information in the Dow Jones News Service (DJNS) and the Wall Street Journal (WSJ), the two comprehensive sources [6]. Roll's results highlight the importance of private information, sentiment-based trading or very frequent changes in risk premia in explaining stock returns [6].

Tetlock measured the interaction between media and the stock market using the content of a column in the US Wall Street Journal [15]. The author found that high media pessimism strongly predicts downward pressure on market prices and that unusually high or low pessimism has high trading volume [15]. Moreover, Tetlock, Saartsechansky and Macskassey studied a large selection of newspaper articles in the US and examined the relationship between accounting earnings of individual firms and stock returns. They found that stock prices are sensitive to negative feedback and that the predictive power of negative news is greatest for stories that focus on fundamentals [10].

Then, this paper is structured as follows. First, we review the literature on the relationship between public financial information published by mainstream media and financial market performance. Second, we present our estimation model and finally we report and discuss the results of our study.

## 2. Literature Review

Philip J. Stone, Dexter C. Dunphy, Marshall S. Smith and Daniel M. Ogilview were the first to speak of media sentiment. They described how words and sentences are quintessential human artefacts, the products of social constructs and experiences that provide essential evidence about individual and collective processes such as economic and financial activities and behavior [11]. They defined content analysis as any technique that allows for the objective and systematic inference of specified features of a context [11]. Examining raw data of words and sentences, behavioural scientists have become increasingly adept at uncovering evidence of text feelings. Sentiment is now understood to be articulated in many forms of human discourse: public speeches, news reports, blogs and other forms of written, spoken and visual communication.

Paul Tetlock quantitatively measured the interaction between media and the US stock market using the contents of a column in The Wall Street Journal. The author found that pessimistic media content predicts trends in US stock market activity. He also noted that high values of media pessimism induce downward pressure on market prices; and unusually high or low values of pessimism lead to temporarily high market trading volume [15].

Moreover, the author found that in both sets of return regressions, negative words predicted the same temporary decline and reversal predicted by the pessimism factor. Changes in negative words and changes in poor words predicted a robust increase in volume.

Similarly, Eric K. Kelley and Paul C. Tetlock examined all Dow Jones Newswires and Wall Street Journal (WSJ) articles

on US companies listed on the NYSE, AMEX or NASDAQ over the 2003 to 2007 period. They found that investors positively predict returns at horizons of up to 20 days and that return predictability does not reverse at the quarterly horizon [9].

They found that retail investors who use total price orders and those who use baseline orders provide liquidity when their supply is limited. Thus, retail investors' aggregate decisions are "smart" in two ways: they positively predict the cross-section of stock returns and improve price informativeness.

In the same line of thought, Diego Garcia examined two columns publishing financial information in the American daily New York Times. Indeed, the two columns in the study were essentially summaries of events on the New York Stock Exchange during the previous trading day. Thus, the "Financial Markets" column was slightly shorter, at around 700 words per day, compared to 900 words for the "Topics in Wall Street" column [7].

The author found that news content predicts stock market returns on a daily basis, particularly during the recession period. However, the effect is particularly strong on Mondays and days after holidays, when investors have time to read the news, and it persists into the afternoon of the trading day.

Moreover, Ammann and al studied the German market and noted that the correlation and the Granger causality analyses provide an initial understanding of the possible relationships and causalities between the German stock index and newspaper articles [1]. Indeed, they found that throughout the sample period, five positive and three negative words have a statistically significant effect. For the different sub-samples, they found that newspaper articles have a deeper explanatory power during the second half of the sample period.

Furthermore, Nicky J. Ferguson and al examined the UK market, focusing on articles from daily newspapers (The Financial Times, The Times, The Guardian and the Mirror), over the 1981 to 2010 period [16]. However, they found that the tone (both positive and negative) and volume of news content provides investors with valuable information that impacts future stock market returns. Specifically, they found that the number of positive words in media content predicts higher returns the next trading period, while the number of negative words in mainstream media content predicts lower returns the next trading period [16].

Similarly, N. R. Sinha measured the tone of news articles over the 2003 to 2010 period, using a score provided by the Canadian-British news agency Thomson Reuters, as a weekly measure of qualitative information [13]. The measure predicts future returns over the next 13 weeks and mitigates the short-term reversal of the weekly momentum strategy. The author noted that a strategy based on weekly qualitative information generates economically significant excess returns, even for the largest quintile of stocks in the sample.

With the same objectives, A. Carretta and al examined whether the channels and means of information communication affect abnormal stock returns [4]. They studied their dimensions in a large sample of governance

information published between 2003 and 2007 in the main Italian financial newspaper "Il Sole 24 Ore". They found that the media had a significant impact on financial markets, as published information can contribute to forming investors' expectations [4]. The results of their study provide evidence that stock market returns tend to increase after news releases if the company involved is not profitable at the time of the news release. Otherwise, the overall effect on stock returns is substantially negative.

Meanwhile, J. L. Rogers and al used insider trading disclosure to determine whether the way news is disseminated by media affects how securities react to news [12]. To this end, they examined whether release of information on the Dow Jones newswires that comes shortly after its public release affects how information is incorporated into stock prices. They used data from Raven Pack, which provides time-stamped data for all information disseminated via Dow Jones Newswires. To this end, they examined insider trading information in two ways that directly assess the effect of the dissemination of insider trading information on prices and their volumes. They found evidence that speed of adjustment and possibly the overall price effect is affected by the presence and speed with which media-covered prices adjust more quickly to insider trading filings. This suggests that the media plays an economically important role in the price formation process of securities markets.

Our study aims to examine the relationship between qualitative verbal information in the print media and the stock performance of financial companies. Therefore, we will test the following hypotheses:

Hypothesis 1: The number of positive articles affects stock performance

Hypothesis 2: The number of negative articles affects stock performance

Hypothesis 3: Average negative words affect stock performance

Hypothesis 4: The number of positive articles affects market capitalization

Hypothesis 5: The number of negative articles affects market capitalization

Hypothesis 6: Average negative words affect market capitalization

Hypothesis 7: The number of positive articles affects trading volume

Hypothesis 8: The number of negative articles affects trading volume

Hypothesis 9: Average negative words affect trading volume

### 3. Research Methodology

This study examines data taken from two distinct sources. The first is the national documentation centre and the second is the site of the Tunis Stock Exchange. Our study examines weekly information published over six years, from 01 January 2010 to 31 December 2015. We included 26 financial companies (Banks, Insurance and Leasing companies) listed on the Tunis Stock Exchange (BVMT).

#### 3.1. Type of Information

In this study, we extracted articles treating the following areas:

- 1) Capital increase,
- 2) Profit announcement,
- 3) Increase in turnover,
- 4) Launching of new products,
- 5) The granting of credits and obtaining loans,
- 6) Increase and decrease of share price,
- 7) Distribution of dividends,
- 8) Mergers and acquisitions of companies,
- 9) Completion of transactions,
- 10) Increase and decrease of the net gross income.

#### 3.2. The Estimation Models

We will estimate two dynamic models used by Khurshid Ahmad and al, first to test the impact of verbal qualitative information of print media on the stock returns of Tunisian financial companies and second to test the impact of stock returns on qualitative verbal information of print media [8].

$$R_{i,t} = \alpha_{1,i} + \sum_{k=1}^5 (\beta_{1k} R_{i,t-k}) + \sum_{k=1}^5 (\delta_{1k} M_{i,t-k}) + \theta_1 DLun_t + T_1 DJan_t + \Phi_1 DMer_t + \varepsilon_{i,t}^R \quad (1)$$

$$M_{i,t} = \alpha_{2,i} + \sum_{k=1}^5 (\beta_{2k} R_{i,t-k}) + \sum_{k=1}^5 (\delta_{2k} M_{i,t-k}) + \theta_2 DLun_t + T_2 DJan_t + \Phi_2 DMer_t + \varepsilon_{i,t}^M \quad (2)$$

The two models include the qualitative verbal information variable ( $M_{it}$ ), the market return variable ( $R_{it}$ ) and the control variables ( $Lun_t$ ,  $Jan_t$  et  $Mer_t$ ). Model estimation is carried out by the generalized method of moments (GMM) in dynamic panels, using the STATA 13 software.

#### 3.3. Definition of Variables

We will use 3 variables measuring the stock returns of Tunisian financial companies, 4 variables measuring qualitative verbal information of written media and 3 control variables.

1) Variables measuring qualitative verbal information:

- a) News: Takes 1 if they were published articles, otherwise 0.
- b) The number of positive articles
- c) The number of negative articles
- d) The average negative words for each article.
- 2) Variables measuring stock returns:
  - a) Stock return: is the difference between the natural logarithm of  $P_t$  and  $P_{t-1}$ .
  - b) Market capitalization: (BVMT website)
  - c) Trading volume: (BVMT website)
- 3) Control variables:
  - a) Monday effect: Takes 1 if the day is Monday, otherwise 0.

- b) January effect: Takes 1 if the month is January, otherwise 0.
- c) Wednesday effect: Takes 1 if the day is Wednesday, otherwise 0.

**3.4. The List of Selected Words**

Like in Tetlock, to measure qualitative verbal information, we will use negative and positive words from the General Inquirer's Harvard-IV-4 classification dictionary [15].

*Table 1. List of words.*

Positive words	Good, challenged, advanced, innovative, increasing, performance, relevant, developing, improving, growth, larger, successful, recession, supporting, advantageous, benefiting, expanding, favouring, important, gain, sufficient, more, effective
Negative words	Crisis, disease, handicapped, difficulty, many, abundant, obstacle, failures, breakdown, problem, lost, diminished, Deficient, bad, poor, balanced, fragile, failure, costly, deteriorated, damaged, disturbed, limited

Our study is limited to a well-defined list of positive and negative words.

**4. Results**

This section will first present the descriptive statistics of the entire sample. Second, it reports the main results of the estimation models.

**4.1. Descriptive Statistics**

Descriptive statistics are an essential preliminary to our quantitative study. They allow us to summarize the trends of the selected data: the Mean, Standard Deviation, Minimum and Maximum.

*Table 2. Descriptive Statistics.*

Stat.	Stock. Return	Trad. Vol	Mark. Cap	Posit.	Negat.	Average. Word
Mean	.0371633	6643.322	328.4639	.1683107	.0437677	.2685242
P50	.0104572	1382	199.66	0	0	0
Max	1.412062	654520	5478.79	5	5	15
Min	-.9241	1	0	0	0	0
Sd	.2081171	22021.93	368.8577	.5446243	.2785958	1.611731

Table 2 presents the descriptive statistics for the entire sample. We notice that during the six years of our study the number of positive articles published on Tunisian financial companies is 16.83%. This percentage is higher than the average negative articles which is 4.376%. The journalists of "La Presse" used positive words much more than negative words in their articles.

In the appendices, we present the descriptive statistics for each financial company. We see that all publications on financial companies during the six years of our study are articles with more positive than negative words. The Société de Placement et de Développement Industriel et Touristique SPDIT SICAF, has 16.98% positive against 3.52% negative articles. This news is good for the stock market since it witnessed a return on shares of 17.76%.

For the two following companies El wifack Leasing and TUNINVEST SICAR, there are no articles published with negative words. The market therefore reacted positively to the good news and saw the following significant returns: 11.78% and 11.09%.

In the correlation matrix, we see that there is no correlation between most of the variables. On the other hand, we found a strong correlation between the number of positive articles and news which is 0.8157. Then, most of the published articles are positive.

**4.2. Results of the GMM Method in First Difference**

In this section, we first present the results of the effect of the

five-day lagged values of the qualitative verbal information variables on the stock returns, trading volume and market capitalization variables. Second, we present the results on the effect of the stock returns variables on the qualitative verbal information variables.

**4.3. Results of the First Equation**

The binary variable News shows a negative coefficient of (-.0022321) with a probability greater than 0.1 amounting to (0.170). Indeed, the variable News has no significant impact, i.e. the variation of the variable News does not affect Returns.

The three control variables have a significant impact on stock returns. The Monday and Wednesday effect positively affects stock returns, while the January effect negatively affects returns. Indeed, for the Monday effect, we found a coefficient of (.0120272) with a probability of (0.006 < 0.01). Then, we can conclude that the Monday effect is significant at the 1% level. The coefficient for the January effect is (-.0265896) with a probability of (0.000 < 0.01), indicating that the January effect is also significant at the 1% level. For the Wednesday effect coefficient (.007164), its probability is (0.015 > 0.01), suggesting that the Wednesday effect is significant at the 5% level.

We notice that the set of probabilities of the variable "number of positive articles" and the control variables is above the significance level. Therefore, the variables number of positive articles, news and the control variables (the

Monday effect, the January effect, the Wednesday effect) do not have significant effects. More specifically, the variation of the variable number of positive articles does not affect the trading volume of Tunisian financial companies. The variation of the variable number of positive articles, the news and the control variables do not affect the market capitalization of Tunisian financial companies. The variation of the variable number of negative articles with five days delay affects the stock returns of Tunisian financial companies. The variation of the variables January effect and Wednesday effect affect the weekly stock returns. The news variable and the Monday effect variable have a probability above the threshold. Therefore, these variables are not significant.

The lagged variable number of negative articles, along with the news and the control variables are insignificant. In addition, these variables do not affect the trading volume of financial companies.

We found that the lagged variable number of negative articles as well as the two control variables (the Monday effect, the January effect) are insignificant. However, the Wednesday effect variable is negatively significant at the 10% level. The variation of the Wednesday effect variable affects the market capitalization of Tunisian financial companies.

We notice that the variable average negative words with a lag of 3, 4 and 5 days is negatively significant at the 1% and 5% thresholds. i.e. average negative words published in articles with 3, 4 and 5 days delay negatively affect the stock performance of financial companies. Similarly, we found the January effect variable is negatively significant at the 1% threshold, indicating that articles published in the month of January affect stock returns.

The Wednesday effect variable is positively significant at the 10% threshold, suggesting that articles that are published every Wednesday affect stock returns.

The January effect variable is negatively significant at the 10% level, indicating that articles published during the month of January negatively affect the trading volume of Tunisian financial companies.

Moreover, the probabilities of the average lagged variable of negative words are insignificant. Therefore, the variation of the lagged variable does not affect trading volume.

In addition, the lagged variable and the control variables are insignificant. More specifically, the variation of the lagged variable, the average negative words and the control variables do not affect the market capitalization of the financial companies.

#### **4.4. Results of the Second Equation**

The second equation in our regression aims to detect the effect of the stock return variables on the qualitative verbal information variables. We notice that the probability of the variable L3 returns is 0.036. Therefore, this variable is positively significant at the 5% level. The variation of the variable "3 days return" affects the number of positive articles.

The probabilities of the variable "two, three and five day returns" (0.035) (0.020) (0.037) are significant at the 5% level. The variation of this variable affects the number of

negative articles.

Bearing on the results on the effect of returns on average negative words, we found that the lagged variable return is insignificant, i.e. the variation of the stock returns variable does not affect the average negative words published by news articles. However, we found that the probability of the Monday effect variable (0.016) is lower than 0.05. Therefore, this variable is significant at the 5% level. The probability of the Wednesday effect variable is (0.000), indicating that it is significant at the 1% level. The variation of the Monday effect and Wednesday effect variables affects the average negative words.

Bearing on the results on the effect of trading volume on the number of positive articles, we found that the probabilities of the variable trading volume lagged by 1, 3 and 5 days are respectively (0.005) (0.001) (0.000). The variable lagged by 1, 3 and 5 days is significant at the 1% level. The variation of the variable "trading volume" lagged by 1, 3 and 5 days, on the one hand, and of the variables news, Monday effect, Wednesday effect and January effect, on the other hand, affects the number of positive articles.

Bearing on the results on the effect of trading volume on the number of negative articles, we notice that the lagged variable trading volume with one, three, four and five days delay is significant at the 1% threshold. Similarly, the news variable and the Wednesday effect are significant at the 1% level.

The variation of the lagged trading volume variable along with the news and the Wednesday effect variables affect the number of negative articles published per week.

For the results on the effect of trading volume on average negative words, we notice that the lagged trading volume variable is significant at the 1% and at the 5% threshold. The variation of the lagged trading volume variable affects the average negative words. Furthermore, the variables news, Monday effect and Wednesday effect are significant at the 1% threshold. Similarly, the January effect variable is significant at the 5% level.

For the results on the effect of trading volume on the number of positive articles, the lagged trading volume variable is found to be insignificant, i.e. the variation of the trading volume variable does not affect the number of positive articles. However, we found that the news variable is significant at the 1% level (0.000), while the January effect control variable is significant at the 5% level (0.038).

For the results on the effect of market capitalization on the number of negative articles, we notice that the variable market capitalization lagged by one day is significant at the 1% level. Similarly, we found that the news and the Wednesday effect variables are also significant at the 1% level.

The variation of the trading volume variable with 1 day delay, along with the variation of the news and the Wednesday effect variables affect the number of negative articles.

Bearing on the results on the effect of market capitalization on average negative words, we notice that the lagged variable market capitalization is not significant. The variation of the market capitalization variable does not affect average negative words. However, the probability of the Wednesday effect variable is 0.002. This variable is significant at the 1% level.

More specifically, the articles published each Wednesday include a significant number of negative words.

#### 4.5. Validation Tests

The results presented in the appendix indicate that the Arellano Bond and the Sargan test probabilities are valid. Moreover, we found that the instruments used in our regression are valid because the tests do not reject the hypothesis of validity of the lagged variables in level and difference as instruments.

### 5. Conclusion

In this study, we tested the reaction of the Tunisian stock market to the publication of qualitative information disseminated on print media, using the models of Ahmed and al [8]. Specifically, the model is estimated by the generalized method of moments (GMM) in dynamic panels, using STATA 13 software. The results indicated that the number of positive articles published one day and four days ago do not have a significant impact, i.e. the variation of the variable number of positive articles with a lag of one day and a lag of four days does not affect stock returns. Moreover, the variation of the variable number of positive articles does not affect the trading volume of Tunisian financial companies. The variation of the variable number of negative items with a five-day delay affects the stock returns of Tunisian financial companies.

In summary, despite the relegation of the role of print media, we found that qualitative information published by classical media remains relevant. Published bad news negatively affects the market and more specifically stock returns. However, it is essential to highlight the role of good qualitative and quantitative financial communication in traditional media for the proper functioning of the Tunisian financial market.

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