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Can Company Radiation Announcement Influence Investor Sentiment and Predict Abnormal Returns? Tunisia Evidence

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Abstract

The purpose of this paper is to observe whether the announcement of company radiation can affect their abnormal return on the Tunisian stock exchange. The sample includes 5 non financial listed stocks in Tunisia Stock Exchange during the years 2012-2021. Company decides to announce its radiation to signal the market that the firm is now processing future prospects, which will result in changing its stock prices. The findings yield qualitatively consistent with the previous research. The result shows that the stock prices move upward significantly after dividend announcements. Abnormal return (AR) and cumulative abnormal return (CAR) from the market model are statistically significantly revealed. Moreover, most event windows show that the stock return becomes lower when the company delisted from stock market. The result is limited to the absence of an important number of firms listed in TSE from this period. Investors in Tunisia react negatively to firms' radiation and show their preference for dividend to self control, satisfaction and increase their profit. This document provides evidence of the phenomenon of firms' radiation from markets, we document the impact of delisting announcement on stock returns. Even though the results indicate that Tunisian market react to the announcement of companies' radiation by managers. Moreover, the timing of delisting decision is affected by some different factor related to the firms' situation and institutional environment. Tunisian investors react negatively to the announcement to firms delisting from Tunisian market.

Keywords: *Radiation Decision, Abnormal Returns, Cumulative Abnormal Returns Market Model.*

Introduction

In the dynamic landscape of financial markets, the anticipation and reaction to corporate announcement soften serve as barometers of investor sentiment and market volatility. Among these announcements, the disclosure of company radiation—events such as delistings, reorganizations, or regulatory actions—holds particular intrigue for market participants seeking to decipher their predictive power on abnormal returns.

This article embarks on a journey to explore the nexus between company radiation announcements and abnormal returns, drawing upon a mosaic of scholarly works spanning diverse geographies and corporate contexts. Ahmad (2019) offers insights into the discriminative factors between reorganized and delisted distressed firms, offering a nuanced understanding of corporate restructuring dynamics, particularly in the Malaysian context. Complementing this, Binod Guragai's (2022) research investigates market responses to listing deficiency notices, providing empirical evidence from Nasdaq and illuminating the market's reaction to regulatory signals.

Furthermore, the literature encompasses a breadth of investigations into the aftermath of corporate events, with studies such as those by Gilberto Loureiro et al. (2022) and Jinwoo Park et al. (2014) exploring the implications of delistings on earnings management, stock price crashes, and information effects. Beyond delistings, Hartmann et al. (2023) delve into the market's identification of prosperous activist engagements, while Faraji et al. (2020) examine the impact of political connections on stock returns, offering a panoramic view of factors influencing market dynamics.

As we navigate this tapestry of research, ranging from analyses of investor sentiment (Lee et al., 2022) to examinations of audit oversight on foreign listed companies (Gu et al., 2023), a compelling narrative emerges: the potential of company radiation announcements to foreshadow abnormal returns remains a topic ripe for exploration. Through empirical scrutiny and theoretical synthesis, this article endeavors to

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deepen our understanding of the predictive power embedded within corporate announcements, offering insights of relevance to investors, regulators, and market observers alike. By illuminating the interplay between corporate events and market outcomes, we aim to contribute to the ongoing discourse surrounding corporate event studies and their implications for financial markets globally.

Literature Review

The study conducted by Ahmad (2019) investigates the distinguishing characteristics of Malaysian companies that successfully restructure and recover from financial distress. Through logistic regression analysis, the research examines a blend of financial, market, and institutional variables to ascertain whether financially troubled firms will emerge from distress or face delisting. Findings indicate that incorporating factors such as EBITIE, CAR (−1, +1), and the identity of the top 10 largest shareholders enhances predictive accuracy. These insights hold significance for creditors and regulators, facilitating more informed assessments of financial market risk. By streamlining the evaluation of reorganization proposals and reducing associated costs, stakeholders can expedite decision-making processes. Creditors, armed with predictive models, gain leverage in negotiation proceedings, while investors stand to benefit from enhanced foresight into the fate of distressed firms, aiding them in devising investment strategies.

Additionally, the study by Kolari, Pynnonen, and Tuncez (2021) investigates the persistence of long-term abnormal returns following major corporate events, using abnormal standardized returns (ASRs) as a key metric. Drawing on previous research by Dutta, Knif, Kolari, and Pynnonen (2018), Hadfi and kouki 2020, 2021, Hadfi (2020, 2021), which established the superiority of ASR t-tests in terms of size and power compared to traditional statistical methods, the paper re-examines the post-event abnormal returns for various corporate actions including mergers and acquisitions, initial public offerings, seasoned equity offerings, dividend initiations, stock repurchases, stock splits, and reverse stock splits. Contrary to recent studies suggesting a fading impact of corporate events on long-term abnormal returns, this research uncovers significant abnormal returns persisting across different time periods from 1980 to 2015, as evidenced by ASR tests. Furthermore, graphical analyses of ASRs corroborate the statistical findings, indicating a sustained influence of corporate events on long-term abnormal returns.

The interplay between default risk and stock returns is a central concern in investment decisions and asset pricing models. Despite expectations, many studies reveal a surprising negative link between credit risk and stock returns. Xiaolou Yang and Yingyao Hu's (2024) study seeks to unravel this paradox. By focusing on measurement errors, especially in nonlinear models with discrete variables, they shed light on how the relationship between stock returns and default risk is influenced. Their findings underscore the importance of considering credit cycles and the financial health of firms in understanding this relationship.

The study, authored by Muhammad Kashif and al (2023), aims to identify the underlying causes of variation in time series and cross-sectional equity style returns within Pakistan's emerging stock market. Utilizing asset pricing models and incorporating variables reflecting business cycle fluctuations, the researchers assess the time-varying size and value premiums. The methodology involves constructing style portfolios based on firm-specific characteristics such as market capitalization, price-to-earnings ratio, book-to-market equity ratio, momentum, and asset growth. The study findings indicate that the style portfolios consistently generate abnormal returns, which cannot be explained by asset pricing models or business cycle variables alone. However, it is observed that the size and value premiums tend to diminish during economic downturns. This suggests that while macroeconomic factors play a role in portfolio performance, the abnormal returns are largely driven by firm-specific characteristics. Overall, this research contributes insights into the profitability of equity style portfolios in the Pakistani equity market, with implications for stock picking, investment management, and risk factor analysis.

In their study, Jochen Hartmann, Matthias Pelster, and Soenke Sievers (2023) examine the discrepancy between abnormal announcement returns (CAARs) and two-year buy-and-hold abnormal returns (BHARs) of activist engagements. They find that activist targets with the highest two-year BHARs yield only slightly higher CAARs than other targets, suggesting that financial markets struggle to consistently differentiate

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between long-term top-performing engagements and others at the announcement stage. Even top activist soften experience low or negative two-year BHARs. The authors observe that long-term top-performing targets exhibit distinct firm characteristics compared to other targets, potentially aiding in the identification of future successful engagements. However, activists do not exclusively target such firms. Thus, they conclude that the long-term performance of target firms appears to be influenced by a combination of firm characteristics, investor skills, and perhaps some luck, offering limited follow-on investment strategies for external investors. The study of Sergen Akarsu and Ömür Süer (2022) investigates the impact of limited investor attention on stock returns, utilizing the Google search volume index as a measure of investor attention. Additionally, they explore the potential roles of national culture and market development in this relationship. The findings reveal that the influence of investor attention on stock returns varies across different countries, exhibiting diverse directions and levels of significance. Notably, investor attention appears to be more pronounced in individualistic societies, nations characterized by high uncertainty avoidance, and developed markets. Furthermore, the study suggests that abnormal returns have a consistent impact on investor attention across countries, with one-week lagged absolute abnormal returns serving as a positive predictor in sixteen countries. Additionally, the research highlights that in individualistic countries and those with low uncertainty avoidance, investor attention tends to revert to normal levels within three weeks.

Omid Faraji et al (2020) examine the impact of political connections and political cycles on the stock returns of listed companies in Iran. Utilizing a data set comprising 1146 firm-year observations from firms listed on the Tehran Stock Exchange (TSE) spanning the period 2005–2017, the findings reveal a positive association between political connections and both annual actual returns and annual abnormal returns of firms. Particularly, the study highlights that presidential elections simplify the positive relationship between political connections and cumulative abnormal returns. Moreover, the research identifies that the transfer of power to the Moderation (Principe list) party in 2013 and 2005 strengthened and weakened, respectively, the positive correlation between political connections and cumulative abnormal returns. Sensitivity tests conducted throughout the analysis confirm the robustness of the main findings. From a political economy perspective, the results underscore the value of political connections within a centrally planned economy, indicating their enhanced significance during election years. Furthermore, in alignment with rational partisan theory, the study suggests that investors respond to political uncertainties arising from presidential elections and transfers of power, even within emerging market economies like Iran.

In their study, Tracy Gu et al. (2023) utilize the Public Company Accounting Oversight Board's (PCAOB) May 18, 2010 release, which announced the denial of its oversight of certain foreign auditors, as a natural experiment to examine investors' early valuation of the PCAOB's international audit oversight on U.S.-listed foreign companies. By comparing reactions of U.S.-listed foreign companies exposed to the release with reactions of other U.S.-listed foreign companies, the authors find a significant decline in share values for the release-exposed companies. Notably, this decline is predominantly driven by companies with auditors from China, while U.S.-listed foreign companies from 19 European jurisdictions do not experience significantly negative stock market reactions. Through difference-in-differences analyses encompassing earnings response coefficients, abnormal stock returns, trading volumes surrounding earnings announcements, and analyst forecast dispersions, the study further reveals a decline in perceived financial reporting quality specifically for release-exposed foreign listings from China. This contrasts with the absence of such decline for companies from the 19 European jurisdictions, consistent with the findings of the stock market reaction analyses. Overall, these results suggest that the PCAOB's international inspection holds significant value for U.S.-listed companies from China, implying a positive impact on financial reporting quality and investor confidence.

Maria Cristina Arcuri et al (2023) investigate the effects of fake news on the stock returns of targeted firms. Fake news, defined as fabricated information intended to deceive readers while presented as true, is analyzed through the lens of disagreement models. The authors argue that the inability of some investors to distinguish between true and fabricated news can lead to disagreement among investors regarding the true value of the firm, thereby influencing stock prices. Utilizing event study methodology and OLS regressions, the researchers examine a sample of fake news instances initiated by outsiders and disseminated in the US

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and Europe from 2007 to 2019. Their findings reveal that negative false news items exert negative and statistically significant short-term effects on stock returns, while positive and neutral news items do not exhibit a clear impact on stock returns. Additionally, the study finds no significant disparity between the effects of fake news disseminated through traditional media outlets versus social media platforms. Overall, these results contribute new evidence to the understanding of how financial markets can be manipulated through information-based means, shedding light on the impact of fake news on stock returns in both US and EU markets.

Yury Dranev et al. (2019) explore the role of technological development and digitalization in the financial sector, particularly through mergers and acquisitions (M&A) involving fintech companies. Focusing on firms engaged in both IT and financial activities to identify fintech companies, the study investigates the post-acquisition performance of acquiring firms from an investor perspective, measured by abnormal returns. Utilizing event study methodology, the researchers find a significant positive average abnormal return in the short-term following the acquisition of fintech companies, contrasted with a negative average abnormal return in the long-term. They delve into the specifics of cross-border acquisitions, the acquirer's domestic market development level, and other M&A deal characteristics to elucidate investor reactions to fintech firms' acquisition announcements. Through their analysis, the author uncovers the determinants influencing M&A deals in both emerging and developed markets. This study contributes to the existing literature by shedding light on the evolving role of fintech firms in M&A activity within the financial sector and its implications for investor returns. It underscores the importance of considering various factors, including market development and deal specifics, when evaluating the impact of fintech M&A on stock returns.

Gilberto Loureiro and Sónia Silva (2022) investigate whether firms that are cross-delisted from major U.S. stock exchanges experience an increase in crash risk associated with earnings management. They hypothesize that post-cross-delisting, these firms may engage in more aggressive earnings management practices, leading to heightened crash risk. Their analysis reveals that indeed, earnings management has a greater positive impact on stock price crash risk for cross-delisted firms compared to a control group of firms that remain cross-listed. Furthermore, this effect is particularly pronounced for firms from countries with weaker investor protection, poorer quality information environments, and less conservative accounting practices. The study's findings remain robust when considering potential endogeneity in the cross-delisting decision, alternative measures of crash risk, and information asymmetry. The authors interpret these results as evidence of a "reverse bonding effect" following cross-delisting from U.S. stock exchanges, suggesting that firms may feeless constrained in their financial reporting practices after leaving these exchanges, particularly if they originate from jurisdictions with weaker regulatory environments.

In their study, Hwa Lee et al. (2022) address the distress risk puzzle, which posits that stocks with high distress risk should yield higher returns, a notion found to be empirically inaccurate. The authors introduce a novel stock-level investor sentiment measure and demonstrate that individual investor behaviors influence the future excess returns of stocks, even in the presence of distress risk. Their research reveals that despite conventional expectations, net buying by individual investors plays a crucial role in shaping the relationship between credit ratings and future stock returns. By developing a cross-sectional measure of investor sentiment for each individual stock on a monthly basis, the authors uncover how investor sentiment interacts with credit ratings to impact stock returns. Overall, the findings of this study contribute to a better understanding of the dynamics between distress risk, investor sentiment, and stock returns, shedding light on the nuanced factors that influence market outcomes beyond traditional risk measures.

In their study, Ziyang Li et al. (2023) explore the relationship between top management abnormal turnover and the risk of stock price crashes. They note the increasing attention investors in capital markets have paid to management turnover, particularly abnormal turnover at the top management level. The research findings suggest a positive correlation between top management abnormal turnover and the risk of stock price crashes. In other words, higher rates of abnormal turnover among top management exacerbate the likelihood of stock price crashes. The authors also investigate the mitigating effect of directors' and officers' (D&O) liability insurance on this risk, finding that such insurance can help alleviate the impact of top management abnormal turnover on stock price crash risk. Moreover, considering China's unique national

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conditions, the study delves into factors such as political associations and the nature of property rights. The results provide insights into the dynamics of top management turnover and the role of D&O insurance in mitigating stock price crash risk, offering valuable guidance for companies aiming to minimize risk associated with changes in top management.

Binod Guragai (2022) investigates whether investors utilize Form 8-K filings, specifically quantitative deficiency notices required by the Securities and Exchange Commission (SEC), in their investment decision-making process. By analyzing abnormal returns, the study reveals that investors typically react negatively to these 8-K filings. Interestingly, the study also finds that the magnitude of these negative reactions tends to be lower for firms with a higher proportion of institutional investors. Furthermore, the research indicates that firms with a greater analyst following experience less negative market reactions to the deficiency notices. This finding supports the idea that these filings are more informative for investors when the firm's information environment is relatively poor. Additionally, the study highlights that equity and multiple deficiency notice filings tend to elicit more negative reactions and are more likely to result in actual delisting compared to bid priced efficiency notice filings. Overall, these findings contribute to understanding investors' perceptions regarding deficiency notice filings and shed light on the delisting risks associated with such notices, particularly within the context of Nasdaq-listed companies.

Jinwoo Park et al. (2014) examine the impact of involuntary delisting on the Korean stock market and explore the potential for informed trading. The study reveals that involuntary delisting in the Korean market leads to a significant abnormal return ranging between 80% and 90%, accompanied by a drastic education in liquidity. Prior to delisting, the researchers observe that domestic individual investors tend to be net buyers of delisted firms, while both domestic institutional investors and foreign investors are net sellers. Conversely, the share ownership of large shareholders experiences a notable decline of over 30% in the two years preceding involuntary delisting. By utilizing a delisting probability model, the study finds that changes in the share ownership of large shareholders serve as a significant predictor of delisting, whereas those of domestic institutional investors and foreign investors do not. These findings suggest that large shareholders reduce their share ownership in anticipation of delisting, potentially engaging in informed trading. Moreover, the study highlights a wealth transfer from individual investors to large shareholders surrounding involuntary delisting, particularly in markets characterized by weak separation between ownership and control, with substantial participation from retail investors.

Data and Methodology

Sample Description

Our study focused on companies delisted from the Tunisian Stock Exchange (BVMT) over the period from 2012 to 2021.

We have compiled a sample consisting of 50 observations for Tunisia. By having a sufficient number of observations, we will be able to obtain more precise and representative results, thus strengthening the validity of our study. Our data are mainly drawn from the annual reports published by the Tunisian Stock Exchange (BVMT), as well as the prospectuses published by the Financial Market Council (CMF) and the relevant authorities. Other variables, such as macroeconomic variables, are manually collected from the websites of the Central Bank of Tunisia (BCT).

Binary Logistic Regression Model

We will conduct binary logistic regressions to explain the delisting of companies from the stock exchange. The dependent variable is binary (delisted or not delisted).

Logistic regression is employed in studies to verify if independent (or explanatory) variables can predict a dichotomous dependent variable. Unlike multiple regression and discriminant analysis, this technique does not require a normal distribution of predictors or homogeneity of variances.

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From a statistical perspective, logistic regression allows us to directly estimate the probability of an event occurring (in our case, the probability of companies being delisted from the stock exchange).

Our estimation consists of 3 models:

Model 1: Relationship between company characteristics and delisting

$$Delisting_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 DIV_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 GROWTH_{it} + \varepsilon_{it}$$

Model 2: Relationship between governance mechanism and delisting

$$Delisting_{it} = \beta_0 + \beta_1 TF_{it} + \beta_2 CEO_{it} + \beta_3 IND_{it} + \beta_4 CC_{it} + \beta_5 GO_{it} + \beta_6 FO_{it} + \varepsilon_{it}$$

Model 3: Relationship between market situation and delisting

$$Delisting_{it} = \beta_0 + \beta_1 ML_{it} + \beta_2 DM_{it} + \beta_3 IBI_{it} + \varepsilon_{it}$$

Where:

(i,t) indicate respectively the company and time;

β_0: constant parameter;

$\beta_{1...6}$: regression coefficients;

ε_{it}: residual term.

Table 1. Summary of Independent, Dependent and Control Variable

Variables	Definition	Measure
Dependent variable		
Delisting	Companies' delisting	Binary variable = 1 if the company is delisted and 0 if it is still listed.
Independent variables		
ROA	Return on assets	It is the ratio of net income to total assets.
DIV	Dividends distributed	This is the amount of dividends distributed by the company.
GROWTH	Asset growth	It is the movement of the company's assets.
LEV	Debt level	It is the ratio of total debt to total assets.
TF	Board size	This is the number of members of the board of directors.
CEO	Variable duality	Binary variable = 1 if there is a combination of the Chairman of the Board and CEO functions, and 0 otherwise.
IND	Board Independence	It is the ratio of independent members to the total number of board members.
CC	Board concentration	The percentage of capital held by the principal shareholder.
GO	Government ownership	Binary variable = 1 if the principal shareholder is a government and 0 otherwise.
FO	Foreign ownership	Binary variable = 1 if the principal shareholder is a foreigner and 0 otherwise.

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ML	Market liquidity	This is the ratio of market capitalization to Gross Domestic Product (GDP).
MD	Market development	This is the ratio of trading volume to Gross Domestic Product (GDP)
IBI	Index Movement	This is the variation of the country's stock market index.
Control variable		
SIZE	Company size	It is the natural logarithm of the total assets of the company at the end of the accounting period.

Table 2. Descriptive Statistics of Variables

Variables	Mean	Minimum	Maximum	Median	Standard Deviation	Kurtosis	Skewness
ROA	0.088920	-	0.267477	0.076408	0.0631597	3.50902	0.92731
DIV	0.250724	0.0121257	0.583884	0.280449	0.1552336	2.21131	0.20085
SIZE	6.065582	1.232742	8.634429	7.717806	2.81296	1.80845	-0.86809
GROWT	0.050916	-0.25714	0.44437	0.043952	0.143484	3.16814	0.15342
LEV	0.099181	0	0.316896	0.080930	0.086825	2.57252	0.627904
CC	0.1374	0	0.5	0.09	0.153713	2.5883	0.85340
TF	8.3	5	12	7	2.32335	2.13138	0.755486
IND	0.26913	0.155	0.355	0.2575	0.061464	1.82259	-0.31293
ML	0.225824	0.07332	0.346530	0.232979	0.091709	1.57672	-
MD	0.085856	0.02622	0.256965	0.067517	0.062454	5.99940	1.99462
IBI	0.129615	-0.112658	0.485039	0.113478	0.199867	2.11506	0.57548

Modality	Frequen	Percentage
0 : Listed	45	90%
1 : Off-market	5	10%
0 : Separation of	24	48%
1 : Cumulation of	26	52%
0 : Absence of a	30	60%
1 : Existence of a	20	40%
0 : Absence of	37	74%
1 : Existence of	13	26%

Observing the table above, we note that the ROA variable displays an average of 8.89% and has extreme values of -0.49% for the minimum value and 26.74% for the maximum value. For the dividend variable, the average value is 25.07%. This variable fluctuates between a maximum of 8.634429 and a minimum of 1.232742. As for asset growth, this variable has an average of 0.0509163, a maximum of 0.44437, a minimum of -0.25714, and a dispersion of 0.143484. For the ownership concentration variable, the average value is 0.1374. The value of this variable ranges from a maximum of 0.5 to a minimum of 0. Regarding the size of the board of directors, the average is 8.3 with a standard deviation of 2.32335. This suggests that the average board size of the sample companies is around 8-9 members. Board independence has an average of 0.26913 with a standard deviation of 0.061464. This indicates that most companies in the sample have a relatively

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independent board of directors. The "kurtosis" indicator is very high at 5.99940, suggesting a highly spread distribution, even extreme values.

Table 3. Correlation Matrix

	ROA	DIV	SIZE	GROWTH	LEV	CEO	CC	TF	GO	IND	FO	ML	MD	IBI	VIF
ROA	1														2.222
DIV	0.2190	1													3.155
SIZE	-0.0720	0.0594	1												5.466
GROWTH	0.0068	-0.0653	0.2688	1											1.333
LEV	-0.2249	-0.4416	-0.0025	0.0311	1										1.993
CEO	0.0185	-0.1420	-0.3760	-0.1149	0.0216	1									5.433
CC	-0.3366	-0.4392	0.1597	-0.0020	0.3779	-0.616	1								5.006
TF	-0.1684	-0.4200	-0.3106	-0.1499	-0.1093	0.5430	-0.2309	1							2.667
GO	-0.0082	0.1275	-0.0080	0.0768	0.2143	0.5695	-0.4513	-0.037	1						3.112
IND	0.0944	0.0910	-0.1900	-0.2117	-0.0534	-0.135	-0.0673	-0.008	-0.346	1					1.662
FO	-0.0465	-0.0230	0.4474	0.2194	0.0360	0.0490	0.0676	-0.053	0.0745	-0.3257	1				1.611
ML	-0.3990	0.0726	0.7757	0.2395	0.0398	-0.287	0.1938	-0.220	0.0083	-0.1306	0.3923	1			4.559
MD	0.0179	0.0312	-0.5820	-0.3139	0.0112	0.2117	-0.0899	0.1502	0.0033	0.1156	-0.242	-0.4112	1		1.667
IBI	0.2309	-0.0089	-0.1804	-0.0279	-0.0197	0.0625	-0.0961	0.1044	-0.142	-0.0366	-0.070	-0.0513	-0.010	1	1.455
MVIF															**2.995**

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The absence of multicollinearity between the explanatory variables is a fundamental condition for performing a linear regression. Examination of the correlation matrix shows that all the correlation coefficients are less than 0.8, which corresponds to the limit from which we generally start to have serious problems of multicollinearity, Gujarati (20032.Also, the VIF test confirms the absence of multicollinearity problems between the variables.

Table 4. The Determinants of The Delisting Companies

Dependent variable : Delisting	**Estimation model**		
Independent variables	**Firms**	**Corporate governance**	**Market**
C	-2.098919	2.751714	-4.546217
P(value)	0.276	0.525	0.057**
Economic profitability	2.50052		
P(value)	0.733		
Dividend	-2.917492		
P(value)	0.033**		
Company size	0.1195438		
P(value)	0.552		
Asset growth	1.237512		
P(value)	0.722		
Debt level	-3.609082		
P(value)	0.068**		
Ownership concentration		11.74285	
P(value)		0.047**	
CEO Duality		6.400605	
P(value)		0.042**	
Board size		-0.5801652	
P(value)		0.004***	
Government ownership		-3.148116	
P(value)		0.078**	
Board independence		-18.5886	
P(value)		0.215	
Foreign ownership		-0.8075125	
P(value)		0.462	
Market liquidity			5.754275
P(value)			0.000***
Market development			7.448863
P(value)			0.364
Movement of the stock market index			1.939064
P(value)			0.418
Hausman test	0.9968	1.0000	1.0000
Model nature	Random effect	Random effect	Random effect
Wald chi2	1.09	3.11	1.49

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Prob > chi2	0.9547	0.7950	0.6841

NOTE: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In this table, we can observe an overview of variables that have been examined in the analysis of the decision to delist from the Tunisia stock exchange. It presents findings from a regression analysis investigating the factors influencing delisting, with the dependent variable being "Delisting." Three categories of independent variables are examined: Firm Characteristics, Corporate Governance, and Market Situation. Notably, the analysis reveals that among Firm Characteristics, only Dividend demonstrates a statistically significant negative association with delisting, implying that companies with higher dividend payments may be less likely to delist. In Corporate Governance, significant relationships are observed with Ownership Concentration, CEO Duality, and Board Size, indicating that higher ownership concentration, CEO duality, and larger board sizes correspond to increased delisting likelihood. Moreover, Market Liquidity emerges as a highly significant factor in the Market Situation category, suggesting that higher market liquidity is linked to a reduced likelihood of delisting. However, Market Development and Movement of the Stock Market Index do not exhibit significant associations with delisting. Additional model diagnostics, such as the Hausman test and Wald chi2 statistics, support the validity of the chosen random effects model. These findings offer valuable insights into the complex interplay between firm characteristics, corporate governance practices, and market dynamics in influencing the occurrence of delisting events.

Study of the influence of the announcement of the delisting decision on abnormal returns

The announcement of the delisting of a company from the Stock Exchange is of capital importance to study because of its major impact on the financial markets and the intrinsic situation of the company. This section combines a rigorous methodology with an in-depth analysis of the empirical results obtained, thus offering a complete and detailed vision of our study.

To assess the relationship between the announcement of the decision to delist a company from the stock market and abnormal returns, we use the event study methodology. This methodology assumes that we correctly understand the cases that need to be studied, the nature and date of the event as well as the model for estimating stock market returns. According to Brown and Warner (1985), event studies are based on a methodology which involves the determination of a "zero date", corresponding to the date of the event in question. An event window, denoted [-t,+ t], is then defined, representing the period during which the event studied is supposed to influence the prices of the shares concerned. At the same time, an estimation period is established to calculate normal profitability. These studies allow an observer to assess the specific impact of an event on the price of a stock, and they constitute an empirical research technique in finance.

Several recent studies analyze abnormal returns using multiple methods. Faced with significant criticism of the equilibrium model of financial asset markets (CAEM), the authors recommend the use of the abnormal returns methodology on a cumulative return basis.

For the purpose of this study, we chose to study two Tunisian companies, ADWYA and CERÉALIS, which are delisted from the Tunis Stock Exchange in 2023. The collection, processing and preparation of data for empirical testing were carried out, in large part, using data provided by the BVMT market.

The event window includes 15 trading days before the event date and 15 trading days after that date. The choice of this duration is justified by the fact that the adoption of a longer duration risks incorporating variations in returns due to events other than the one studied. A shorter period risks attenuating the identification of the impact of the event. It should be noted that situations involving the presence of several simultaneous events during the period studied were excluded. The event date is established as the first date of announcement of the delisting decision by the board of directors, marked by t = 0.

Calculation of normal yield

$$\mathbf{E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}} \qquad \mathbf{(1)}$$

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With:

Rit: the return of the security (i) on date t;

Rmt: the return of the market index on date t;

εit: the error term of the model;

αi and βi: the model parameters.

The coefficients α and β were estimated using the ordinary least squares method. The adoption of this model requires ensuring that the assumptions which guarantee the validity of the estimators of the parameters αi and βi are respected. These assumptions concern, on the one hand, the stationarity of the distribution of profitability rates and, on the other hand, the normality, independence and linearity of the error terms of the model.

Calculation of Abnormal Return

It is calculated as follows:

ARit = Rit - E(Rit) (2)

With:

ARit: the abnormal return of security (i) on date t.

Calculating the average abnormal return

The average abnormal return is calculated for each security and on each date of the event window. It is equal to:

$$\mathbf{AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it}(3)}$$

With:

AARt: the average abnormal return calculated on date t;

N: the number of titles in the sample.

Calculation of the cumulative average abnormal return

To assess the overall impact of an event on prices, we calculate the cumulative average abnormal return over the entire event window. This measurement is given by the following formula:

$$\mathbf{CAAR_T = \sum_{t=1}^{T} AAR_t(4)}$$

With:

CAART: the average cumulative abnormal return over the event window T.

Even if a researcher identifies abnormal returns, it is essential to demonstrate that these results do not arise from unexpected or biased time series.

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A fundamental assumption states that daily abnormal returns are identically and independently distributed. Furthermore, it is assumed that over an extended period, stock prices tend to converge towards their expected value, which corresponds to the average value.

In order to assess the impact of an event on a company's values, we measure the average abnormal returns (AAR) before and after the event, as well as the cumulative average abnormal returns (CAAR). This makes it possible to observe whether the event had a significant impact on the financial performance of the company.

The independent variable is the stock market delisting decision, which is calculated using the announcement date.

Empirical Results

The tables below show the daily average abnormal returns as well as the cumulative average abnormal returns calculated for the two Tunisian companies ADWYA and CERÉALIS using the market model to evaluate the expected returns during the event period over the entire window. event [-15, +15].

The company ADWYA carried out a Public Withdrawal Offer (OPR) which took place from Wednesday November 30, 2022 to Friday December 30, 2022.

In accordance with the notice of opening of a Public Withdrawal Offer (OPR) published in the official bulletin of the CMF on December 23, 2022, the shares of the company CÉRÉALIS were delisted from the Main Market on February 13, 2023.

Table 5. Average Abnormal Returns, Cumulative Average Abnormal Returns (ADWYA)

Pre Announcement			**Post Announcement**		
Days	**AAR**	**CAAR**	**Days**	**AAR**	**CAAR**
-15	-0,00271	-0,00271	**0**	0,0069862	0,0127427
-14	0,0002081	-0,002502	**1**	0,0063349	0,0190776
-13	-0,004466	-0,006968	**2**	0,0056621	0,0247397
-12	0,0033289	-0,003639	**3**	-0,005641	0,0190989
-11	-0,003751	-0,00739	**4**	-0,007557	0,0115415
-10	0,003654	-0,003736	**5**	-0,004618	0,0069237
-9	-0,00465	-0,008386	**6**	-0,007094	-0,00017
-8	0,0063513	-0,002035	**7**	-0,003313	-0,003483
-7	-0,003225	-0,00526	**8**	-0,006276	-0,009758
-6	0,0042824	-0,000977	**9**	0,0042916	-0,005467
-5	-0,005732	-0,00671	**10**	0,0036102	-0,001857
-4	0,0062256	-0,000484	**11**	0,0040145	0,0021579
-3	0,006867	0,0063829	**12**	-0,004515	-0,002357
-2	-0,00711	-0,000727	**13**	0,004989	0,0026317
-1	0,0064839	0,0057565	**14**	-0,004056	-0,001424
0	0,0069862	0,0127427	**15**	0,0034302	0,0020064

The in-depth examination of the tables provided allows us to draw more detailed conclusions on the average abnormal returns (AAR) and the cumulative average abnormal returns (CAAR) before and after the announcement of the delisting of the companies ADWYA and CERÉALIS.

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First, looking at the pre-announcement numbers, we see some volatility in AAR and CAAR, with values ranging from negative to positive.

The results of ADWYA's correlation study reveal that the highest correlation coefficient in average abnormal returns is 0.009, while the lowest correlation coefficient is -0.0034 before the announcement date. Additionally, the cumulative average abnormal returns display correlation coefficients ranging from -0.001 to 0.0067, representing the lowest and highest values, respectively.

Table 6. Average Abnormal Returns, Cumulative Average Abnormal Returns (CÉRÉALIS)

Pre Announcement			**Post Announcement**		
Days	**AAR**	**CAAR**	**Days**	**AAR**	**CAAR**
-15	-0,003441	-0,003441	**0**	0,0032672	0,0059256
-14	-0,004153	-0,007594	**1**	0,0042916	0,0101859
-13	0,0048993	-0,002695	**2**	0,0049698	0,0151557
-12	0,0094429	0,006748	**3**	-0,005696	0,0094602
-11	-0,003859	0,002889	**4**	-0,006151	0,0033097
-10	-0,004135	-0,001246	**5**	-0,004131	-0,000821
-9	0,0034082	0,0021619	**6**	-0,003264	-0,004085
-8	-0,005766	-0,003604	**7**	0,0021425	-0,001943
-7	-0,003578	0,000139	**8**	0,0039724	0,0020299
-6	0,0037428	0,0038818	**9**	0,0023962	0,004426
-5	-0,007039	-0,003157	**10**	-0,00174	0,0026857
-4	-0,004029	-0,007187	**11**	-0,001796	0,0008898
-3	0,0030341	-0,004153	**12**	-0,002186	-0,001296
-2	0,0040451	-0,000108	**13**	-0,003395	-0,00469
-1	0,0027661	0,0026585	**14**	0,0039523	-0,000738
0	0,0032672	0,0059256	**15**	0,0038883	0,0031504

Around the delisting announcement date, the correlation coefficients for the average abnormal returns and the cumulative average abnormal returns are 0.003 and 0.0058, respectively. The average abnormal returns after the announcement date have correlation coefficients varying from -0.00174 to 0.0049, reflecting the lowest and highest values respectively. Furthermore, the cumulative average abnormal returns after the announcement date display correlation coefficients ranging from -0.0007 to 0.015.

During the entire event period, the correlation coefficient with the highest value is statistically significant, thus demonstrating a positive relationship between the variables. On the other hand, the lowest value demonstrates a negative significance between the stock performance and the date of announcement of the decision to delist from the Stock Exchange.

This result validates the hypothesis that there is a relationship between stock market performance and news announcement.

Detailed analysis of the table relating to the company Céréalis reveals interesting trends regarding average abnormal returns (AAR) and cumulative average abnormal returns (CAAR) before and after the delisting announcement. Before the announcement, AARs and CAARs fluctuate irregularly over the fortnight preceding the event.

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The correlation coefficients relating to abnormal returns show significant variation before and after the announcement of the case. Before the announcement, the lowest and highest values of the correlation coefficients are at -0.002 and 0.0068, respectively, indicating a limited relationship between abnormal returns and the upcoming event. The cumulative abnormal returns display correlation coefficients ranging from -0.0004 to 0.006, indicating a weak association with the event.

However, on the announcement date, a clear increase in correlation is observed. The correlation coefficients with abnormal returns and cumulative abnormal returns reach 0.0069 and 0.012, respectively, highlighting a more pronounced positive relationship. This enhanced correlation can be attributed to the direct impact of the announcement on stock returns.

After the announcement, the correlation coefficients with abnormal returns vary. The lowest coefficient is -0.003, which may suggest a slight negative trend, while the highest coefficient is 0.006, indicating a moderate positive association. As for the cumulative abnormal returns, the lowest and highest correlation coefficients are −0.0018 and 0.024, respectively, reflecting greater dispersion of cumulative returns around the event.

The graphs, presented below, allow us to understand the market reaction to the delisting decision through the average and cumulative abnormal returns observed over the event window [-15, +15].

Our study shows a strong reaction of the stock market to the announcement of delisting of Tunisian companies. Thus, our results are compatible with other previous work investigating the reaction of the Tunisian financial market with other microeconomic (dividend distribution) and macroeconomic (Covid-19 epidemic) variables.

Conclusion

This research investigates the association between some different factors related to firm's liquidity, corporate governance and market situation and radiation announcement firms in the Tunisia Stock Exchange. Market reaction is measured by AR and CAR and the company decision to delist from the market. The result shows that there is positive statistically significant correlation between the market radiation and the stock return. It means that stock return will be higher if the ratio of dividend yield is also higher since there will be stock price increases followed by the high market reaction. Then, most event windows show that the stock return becomes lower when the investor sentiment for dividend is higher.

The results of this empirical study indicate that the stock prices move upward significantly after dividend announcements. Abnormal return (AR) and cumulative abnormal return (CAR) from the market model are statistically significantly revealed. The results confirm that signaling theory as the radiation announcements have significant impact on share prices.

Tunisian investors must properly exploit the dividend announcement period to benefit from this fund. Above all, in the period of our study describing the abnormal economic and social situation (the Tunisian political crisis) whose market is depressed and the companies are having economic difficulties. Also, Tunisia is an emergent country of civil law characterized by a low governance index and reliable investor protection, so Tunisian investors must increase the dividend premiums placed in the actions of the paying companies to encourage these managers to continue and do not stop the dividend distribution. Finally, in a very financial market can develop, a period of economic and financial destabilization, a weak protection of the shareholders, therefore, the investors must exploit the period of announcement and distribution of dividend to maximize their profit and to realize abnormal returns.

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