

Comparative analysis of small and medium-sized enterprises (SMES) versus large companies during the COVID-19 pandemic: Evidence from Moroccan financial market

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Abstract: The COVID-19 pandemic significantly affected global financial markets, and Morocco proved no exception. This article analyzes the impact of the pandemic-related announcement on the stock market returns of small and medium-sized enterprises (SMEs) and large companies listed on the Casablanca Stock Exchange. Using event study methodology. This research reveals that SMEs suffered more significant and prolonged declines in stock market returns than large companies, which demonstrated greater resilience. The results underline the importance of adopting crisis management strategies tailored to the specific characteristics of companies according to their capitalization. This offers insights for decision-makers, investors and managers seeking to navigate through periods of major economic turbulence.

Keywords: Casablanca stock exchange, COVID-19, Event study, Large companies, SMEs, Stock returns.

1. Introduction

The COVID-19 pandemic, declared by the World Health Organization (WHO) in March 2020, has caused major economic and financial upheaval across the globe. In Morocco, the impact on the financial market was immediate and significant. The MASI (Moroccan All Shares Index) on the Casablanca Stock Exchange fell by almost 17% between February and March 2020, in line with international trends. This sharp market decline reflects investors' uncertainty and panic in the face of the sudden halt to economic activity and the containment measures imposed to curb the spread of the virus.

Despite this initial fall, the Moroccan market showed signs of resilience, with a gradual recovery from the end of 2020. By the end of 2021, market capitalization had returned to pre-pandemic levels. However, this recovery has been uneven, with larger companies benefiting from a greater capacity to absorb shocks thanks to more robust financial resources, while SMEs have been more severely affected. The increased volatility of small-cap returns highlights their vulnerability to economic crises of this magnitude. In response to this situation, the Moroccan government set up a Special Fund for Pandemic Management, which raised funds to support the economy and stabilize businesses, particularly SMEs, which were particularly hard hit by the drop in demand and difficulties accessing financing. Despite these measures, SMEs continued to struggle to recover, reinforcing the need for appropriate strategies to protect this crucial segment of the Moroccan economy.

The aim of this article is to examine the impact of announcements linked to the COVID-19 pandemic on the stock market returns of small and medium-sized enterprises (SMEs) as well as large companies in Morocco. To do so, we will first conduct a comprehensive review of the existing literature in order to situate our study in the context of previous research and identify the main relevant theories and findings. Next, we will present the research methodology adopted, detailing the analysis techniques employed, the data sources used and the criteria for selecting the companies studied. Using an event study approach, this research aims to fill the gap in specific work on the comparative returns of

Moroccan SMEs and large companies during the pandemic, by identifying differences in stock market returns in response to COVID-19-related announcements. The results of our analysis will be presented and discussed in relation to the hypotheses formulated and previous work. Finally, we will conclude by summarizing the main findings of our study and proposing avenues for future research, aimed at deepening our understanding of the impact of health crises on financial markets. This article highlights the need to take into account the specificities of companies according to their capitalization, in order to develop appropriate risk management and economic support strategies during periods of crisis. It thus provides valuable insights for investors, managers and policy-makers.

2. Literature Review and Development of Hypotheses

Financial literature in the 1960s was enriched by the distinguished contribution of Fama, Fisher, Jensen and Roll (1969) [1], who introduced the term “market efficiency”. However, Malkiel & Fama (1970) [2] introduced the semi-strong form of market efficiency, asserting that stock prices adapt quickly to new public information. In other words, prices will be determined by new information and will be influenced very quickly. This type of public information includes corporate announcements, changes in economic policy, regime changes, natural disasters and epidemics. As a result, market efficiency is considered a basic assumption of event study methodology. However, a number of non-economic events have been the subject of empirical studies to investigate their impact on financial markets.

On the face of it, a small and medium-sized enterprise (SME), according to the criteria of the Casablanca Stock Exchange's alternative market, is a company with sales of less than 500 million dirhams, a balance sheet total of less than 200 million dirhams, or fewer than 300 employees (Rehali Youssef & Touhami Fatima, 2021) [3]. Nevertheless, the COVID-19 pandemic has profoundly affected financial markets worldwide. Stock markets performed poorly in response to the crisis. For some sectors, this situation can be seen as a crisis, while for others it represents an opportunity, not least because of the significant improvements observed in certain specific areas (Ben Hssain et al., 2022) [4]. Accordingly, Corbet et al. (2021) [5] examine the impact of the pandemic on the topological properties of the US and Brazilian stock markets, observing a decrease in normalized length as the correlation coefficient increases during crises. Ji, Zhang and Xu (2024) [6] also confirm that stock markets reacted unfavorably to pandemic-related announcements, particularly containment measures. COVID-19 was one of the recent events that severely affected the economy (Li et al., 2022) [7]. With this in mind, the COVID-19 pandemic has created unprecedented challenges for communities and economies worldwide. This health crisis triggered a financial crisis, also affecting the various stock markets in the face of the virus' consequences (Chikri, 2020) [8]. According to Al-Jabouri and Kazim (2023) [9], the study examines the impact of the COVID-19 pandemic on the international financial market, focusing on 20 countries with the highest infection and death rates. The authors find that countries adopted similar strategies to control the spread of the virus, resulting in significant social, governmental and economic disruption. The study highlights the volatility of stock markets and the wider financial implications of the pandemic. Putri and Akwetteh (2020) [10], examined financial behavior during the COVID-19 pandemic, highlighting cognitive errors that can influence financial futures. From a behavioral finance perspective, the authors explore psychological biases observed during this crisis, such as excessive market volatility and sometimes unexpected confidence in certain financial institutions, phenomena unexplained by traditional market paradigms.

In Africa, several studies have examined the impact of the COVID-19 pandemic on financial markets, including those by Ben Hssain et al (2022) [4], Harabida and Radi (2020) [11], Beraich et al (2021) [12], Abouelfarag and Qutb (2022), and Chinedu et al (2022) [13].

Ben Hssain et al (2022) [4] made a significant contribution by analyzing the effect of COVID-19 on Moroccan sectoral stock market indices. Their findings are essential for developing strategies to ensure financial resilience in the face of future health crises. Harabida and Radi (2020) [11] demonstrated that the pandemic had a negative impact on the Moroccan financial market. They observed stronger market reactions over short event windows, particularly around key dates, while these reactions were attenuated over longer periods. As for Beraich et al (2021) [12], they found that the MASI index in

Morocco suffered a considerable shock during the containment period, followed by increased volatility, underlining the fragility of the market in crisis contexts. In the same vein. The study conducted by Abouelfarag and Qutb (2022) aims to assess the efficiency of the Egyptian stock market at the semi-strong level by analyzing the impact of the declaration of the COVID-19 pandemic on the stock returns of companies listed on the Egyptian Stock Exchange (EGX). Using the event-study method, the authors examined changes in the returns of the 100 most liquid and active companies between September 12, 2019 and April 5, 2020. The results revealed market inefficiency at this level, indicating that the COVID-19 announcement had a negative but statistically insignificant effect on stock returns. This inefficiency seems to be linked to “noisy trading” behavior on the part of investors. The study by Chineduet al (2022) [13] investigates the impact of COVID-19 pandemic information on stock market returns of healthcare companies in Nigeria. Adopting the event study method, the authors analyzed the share prices of these companies over a 131-day period to detect abnormal returns. The results reveal a positive abnormal return for these companies on the day of the pandemic. However, the t-test, with a value of 1.58, below the critical threshold of 1.96, indicates that, although investors reacted positively to this information, this reaction remains statistically insignificant. The authors conclude that news of COVID-19 has boosted activity in the healthcare sector, and underline the need for the authorities to take advantage of the opportunities offered by this health crisis by stepping up support for the sector.

In the Asian context, several studies have explored the impact of the COVID-19 pandemic on financial markets, including those by Shafi et al. (2020) [14], Aftab et al. (2021) [15], Corbet et al. (2021) [5], Wang and Wang (2021) [16], Wang et al. (2021) [17], Mohammad et al. (2020) , Chikri (2020) [8], Ji et al. (2024) [17], Alam et al. (2021) [18], and Gupta et al. (2021) [19].

To illustrate this impact, Shafi et al (2020) [14] point out that the main victims of the pandemic were micro, small and medium-sized enterprises. Aftab et al. (2021) [15] confirm this finding, revealing that Pakistani SMEs have had to cope with numerous difficulties, such as shortages of goods, logistical bottlenecks, falling demand, reduced profits and sales, limited operations, as well as employee layoffs. Corbet et al (2021) [5] compared the volatility of Chinese financial markets with that of other traditional indices during the pandemic, using data based on influenza indices and recent coronavirus-related indices, they show that within days of the official announcement of the pandemic, significant effects on financial markets began to emerge. Wang and Wang (2021) [16] evaluated the efficiency of financial markets, including the S&P 500, gold, Bitcoin and the US dollar index, during the COVID-19 crisis. They used a multi-scale entropy method over periods ranging from one hour to 30 business days. Their results indicate a sharp drop in market efficiency, particularly for the S&P 500 index, while Bitcoin showed superior resilience, suggesting that it could serve as a safe-haven asset in times of crisis. According to Saleheen and Habib. (2022) [20], the pandemic has severely disrupted global supply chains, affecting economies such as Bangladesh's through job losses, falling exports and unpredictable demand. This crisis reveals the fragility of strategies focused on cost reduction at the expense of flexibility. The study highlights the urgent need to strengthen the resilience of supply chains through a new strategic framework, and identifies ten key attributes for assessing their performance and effectiveness. Wang et al (2021) [16] examined the impact of the pandemic on the Chinese financial market, observing a significant negative effect on the shares of listed companies, with policy implications for financial risk management. Mohammad et al (2020) looked at the impact of containment measures on the Indian stock market and found that, against all expectations, the market reacted positively with significantly positive abnormal returns. Chikri (2020) [8] also showed, using the NARDL model, that the spread of the coronavirus had a negative impact on financial market behavior. Ji et al (2024) [6] conclude that Asian stock markets reacted quickly and negatively to containment announcements, with particularly pronounced abnormal outcomes. However, the results of Alam et al.'s (2021) [18] study show that on the day of the announcement, indices in the food, pharmaceuticals and healthcare sectors showed significant positive returns. Following the announcement, the telecoms, pharmaceuticals and healthcare sectors continue to perform well, while the transportation sector shows unsatisfactory results. Gupta et al (2021) [19] studied the impact of the pandemic on the volatility of Indian stock markets, particularly investment strategies on the Bombay Stock Exchange. Application of the GARCH model revealed a marked increase in volatility during the crisis.

In the European context, several studies have been published, including that by Yiğit and Canöz (2020) [21] and Singh Et al. (2022) [22]. Their research highlights that the COVID-19 pandemic has had a considerable impact on financial markets. Yiğit and Canöz (2020) [21] examined 38 airline stocks traded on the stock markets of 14 European countries, highlighting significant cumulative average abnormal returns in an event window ranging from -50 to +50. Stock reactions varied, with some showing a significant response to the pandemic announcement, while others remained stable. Furthermore, Singh et al. (2022) studied the impact of the COVID-19 pandemic on the stock returns of Indian hotel companies, analyzing 45 firms listed on BSE-SENSEX and NIFTY. The research found positive cumulative abnormal returns before the pandemic and negative returns afterward. These results offer insights to help companies prepare for similar future crises. Charamis and Rodosthenous (2022) [23] point out that the COVID-19 pandemic disrupted exchanges between audit committees and management, complicating the management of financial reports. Their longitudinal study assesses how the quality of financial reporting by small listed companies was affected before and after the health crisis. Li et al. (2022) [7] studied performance changes in UK and global financial markets before and after the COVID-19 pandemic. They found that the pandemic radically transformed stock market dynamics in the UK, leading to the disappearance or heavy losses of many small industries.

Based on the literature, we formulate the following research hypothesis:

H₁: SMEs listed on the Moroccan financial market were less resilient during the pandemic period than GEs.

3. Data and Methodology

In this section, we discuss the basic principles of the event study methodology. We then present the sample and the time series used in the study, before detailing the regression model.

3.1. Methodological Process

To analyze the impact of the Covid-19 pandemic on the stock market returns of SMEs and large corporations, we will adopt the event study methodology. This approach is commonly used to assess the effect of a non-economic event on the value or return on equity of a company. The methodology is based on the fundamental premise of “market efficiency”, meaning that stock prices incorporate all relevant information available to market participants (McWilliams & Siegel, 1997) [24]. In practice, this means that in an efficient market, any specific event has an immediate impact on stock price trends and returns.

However, when information is released to the market prior to an official announcement, the use of the event study methodology will be tricky, as it is difficult to determine when market participants became aware of the new information. The methodology assumes the non-existence of confounding effects, i.e. that abnormal returns are the result of the event studied and not of another. In order to assess the impact of the event on stock markets, the methodology requires first estimating the abnormal return, which is the difference between the observed return and the expected return. If the announcement of an event is good news, we expect abnormal returns to be positive, indicating that the market believes the event will increase the value of the company. On the contrary, negative abnormal returns signal bad news, and the market believes that the event will decrease the company's value. Next, we need to calculate the average abnormal return and the cumulative average abnormal return for the sampled companies, in order to test their statistical significance. Indeed, if the cumulative average return is statistically different from zero, we can affirm that the event has a significant influence on stock prices.

3.2. Data Description

This study assesses the impact of the Covid-19 pandemic on the stock market returns of SMEs and large companies on the Moroccan stock market, using an event study methodology. However, this methodology relies on the identification of two periods: the estimation period and the event period. In fact, the estimation window is usually between 100 and 300 days (Peterson, 1989) [25]. For our study, we chose an estimation period of 300 trading days, from October 13, 2018 to December 29, 2020. However, typical event window durations range from 21 to 212 days (Peterson, 1989) [25]. For our study, we chose as event date the date of declaration of the state of health emergency by the Moroccan

government, which is practically March 13, 2020. Referring to related research (Liu et al., 2020, Harabida and Radi, 2020), we defined the event window as 50 tradings days.

Concerning the sample, it is composed of SMEs listed on MASI Mid and Small Cap as well as large companies listed on MASI.

This study covers companies listed on the Casablanca stock exchange, in order to compare SME returns with those of large companies. After defining the estimation and event periods, we calculate the abnormal returns of the different companies listed on MASI. Indeed, to measure the abnormal returns of companies, we need to estimate the expected returns for each of them. First, using the Market Model (MM), we regress the stock returns of companies listed on the MASI against the market index return to control for overall market effects. The regression is as follows:

$$R_{i,t} = \alpha_i + \beta_i Rm_t + \varepsilon_{i,t} \quad (1)$$

Where:

$$R_{i,t} = \ln(P_{i,t}/P_{i,t-1}) \quad (2)$$

Where, $P_{i,t}$ is the closing price of share i on day t ; Rm_t represents the market return on day t which is the average of the returns of all the companies included in the global index composed of all equity-type securities which is the Moroccan All Shares Index (MASI) for our study; $\varepsilon_{i,t}$ is the random error term for share i on day t , and α and β are the regression parameters to be estimated which were applied in the following formulas to calculate the expected abnormal return:

$$E(R_{i,t}) = \alpha_i + \beta_i Rm_t \quad (3)$$

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (4)$$

$E(R_{i,t})$, $R_{i,t}$ and $AR_{i,t}$ are respectively the expected return, the actual return and the abnormal return of stock i on day t . The average abnormal return of the sample stocks on day t is calculated as AAR:

$$AAR = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (5)$$

Where, N is the number of companies (0,1,2,...,70,71,72). Abnormal and average abnormal returns can accumulate over time. The cumulative abnormal return (CAR) of share i over a period of time from t_0 to t_1 and the cumulative average abnormal return (CAAR) are calculated from the following equations:

$$CAR(t_0, t_1) = \sum_{t=t_0}^{t_1} AR_{i,t} \quad (6)$$

$$CAAR(t_0, t_1) = \sum_{t=t_0}^{t_1} CAR \quad (7)$$

Finally, to determine the significance of AAR, we used Student's parametric test:

$$t = \frac{AAR}{\sigma(AAR)} \quad (8)$$

4. Results and Discussion

4.1. Descriptive Statistics

Table 1.
Average abnormal yields.

	SME	Larges enterprises
Average	-7.92%	0.00%
Standard error	0.0002	9.9405
Standard deviation	0.0091	0.0031
Kurtosis	368.79	2.994
Skewness	-14,98	-0.3321
Min.	-0.225	-0,0165
Max.	0.021	0.0186
Obs.	1030	1030

Descriptive statistics provide an initial analysis of the abnormal returns of SMEs and large companies (Table 1). Cumulative abnormal returns (CAARs) for small and medium-sized enterprises (SMEs) and large companies (LSEs) differ significantly in terms of volatility, dispersion and distribution. On average, CAARs for SMEs are slightly negative (-7.92E-05). Similar results were observed in studies by Hussain & Ahmad (2021), Martínez, González & López (2022), Singh, Kumar & Sharma (2023) and Aftab et al. (2021). While those for large companies are positive (0.000266), suggesting that large companies react better to events impacting returns. The standard deviation of CAARs for SMEs (0.0091) is significantly higher than for large companies (0.0032), reflecting greater volatility of returns for SMEs. This volatility is reinforced by a marked negative skewness (-14.99) and an extremely high kurtosis (368.8), indicating distributions far from normal with many extreme events. Conversely, large companies show a skewness and kurtosis closer to normal (-0.33 and 2.99 respectively), indicating a more stable and symmetrical distribution of returns. These results suggest that, in the context of event analysis, SMEs are more vulnerable to extreme fluctuations, while large companies are more resilient to market disruptions.

The technical presentation of the two-time series gives us a preliminary observation on the resilience of SME returns compared to large companies. We find that the abnormal returns of SMEs are more dispersed and volatile than those of large companies.

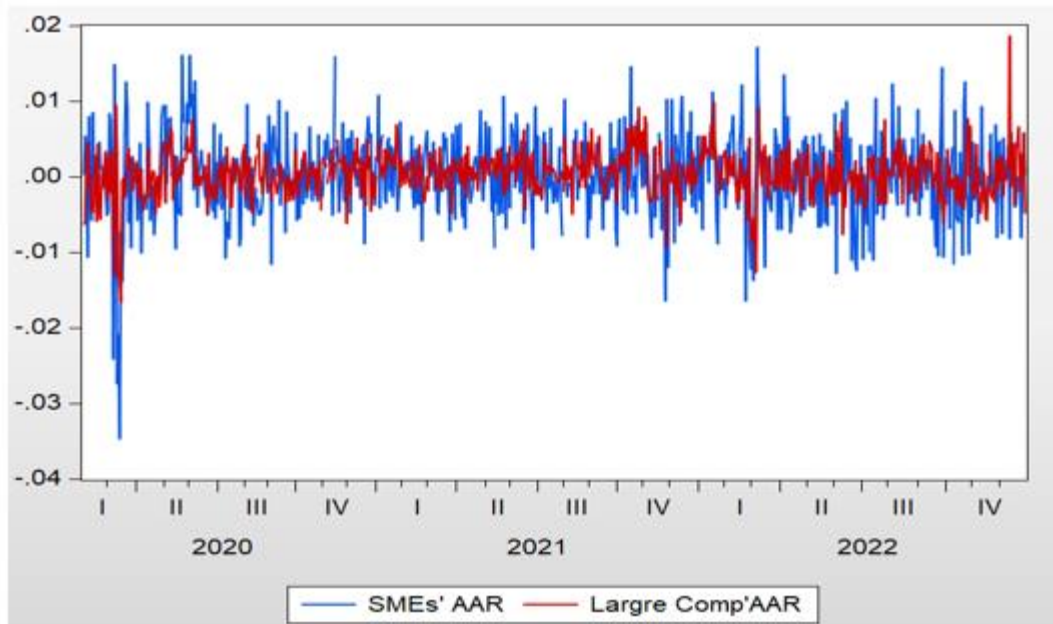


Figure 1.
Average abnormal yields during the event window.

4.2. Hypothesis Testing and Discussion

The same is true for the window (AD-15; AD-1), which stands out for a significant drop in abnormal returns for SMEs compared to large companies, with a rate of -5.206%, proving that stock prices were less resilient compared to those of large companies.

In the combined periods, negative abnormal returns were higher for SMEs, posting CAARs of -11.220%, -10.418% and -6.304% respectively, for the (AD-3; AD+3), (AD-2; AD+2) and (AD-1; AD+1) windows. This finding confirms the vulnerability and degree of resistance of SMEs to the spread of Covid-19, with losses continuing even after the event, notably with a CAAR of -8.31% for the (AD; AD+30) window. This result is consistent with the findings of Hussain & Ahmad (2021), Martínez, González & López (2022), Singh, Kumar & Sharma (2023) and Aftab et al. (2021).

On the other hand, although large companies also show a negative CAAR before the event, their reactivity seems more restrained, with a CAAR of -5.73% for the period (AD-30; AD-1), but they show superior resilience, registering a positive recovery as early as the period (AD; AD+60), where the CAAR reaches 2.22%. This suggests that larger companies have a faster rebound capacity and are less affected in the long term by the event. This may be explained by the impact of the coronavirus, which weakened investor confidence in the stock market due to increased uncertainties (Liu, Manzoor, Wang, Zhang and Manzoor, 2020).

In terms of statistical significance, the t-stats associated with the SME CAAR are much higher before and after the event, indicating a stronger impact. For example, the t-stat of -4.10 for the (AD-5; AD-1) window and -6.32 for (AD-1; AD) indicates that the impact of the event on SMEs is not only greater but also more statistically significant. Conversely, although large companies also record significant t-stats just before the event (e.g., -6.51 for the (AD-1; AD) window), they show rapid post-event improvement with insignificant t-stats in later periods. This dynamic highlights the greater resilience of large companies to economic or financial shocks, compared with SMEs, which suffer a more prolonged and statistically significant impact.

As a result, we confirm hypothesis H1, according to which SMEs listed on the Moroccan financial market were less resilient during the pandemic period than large companies. SMEs experienced sharper and more prolonged declines in stock market returns than large companies, due to their inherent fragility, including smaller size, limited access to financing and greater reliance on restricted supply

chains. These characteristics make them particularly vulnerable to major economic crises. Their limited ability to absorb financial shocks and quickly adjust their operations has led to negative abnormal stock market returns, as observed in Morocco. By contrast, large companies have shown greater resilience. Although they suffered initial losses, their ability to diversify, raise capital quickly and adjust their operations more flexibly enabled them to recover more quickly. This resilience can be attributed to factors such as greater cash reserves, geographic or sector diversification, and better access to credit lines or public financing. SMEs not only reacted more volatile before the announcement of the state of health emergency in Morocco, but also showed difficulties in recovering after the first waves of the pandemic, as evidenced by the persistent negative returns observed in the event windows studied. In contrast, large companies quickly showed signs of post-event recovery, suggesting their superior ability to overcome the economic disruption caused by the pandemic.

These results highlight several key points. Firstly, SMEs, because of their heightened vulnerability to external shocks, require specific support measures from authorities and economic decision-makers. Although support schemes, such as the Special Fund for the Management of the Pandemic in Morocco, have temporarily stabilized these businesses, there seems to be a need for more targeted and sustainable strategies to strengthen their resilience in the face of future crises. Such strategies could include improved access to financing, enhanced crisis management training, as well as incentives to encourage digitalization and business diversification. Secondly, the results indicate that large companies have been able to use their size and resources to better cope with the crisis, suggesting that investors, in times of crisis, may favor large-cap companies for their increased resilience. However, this does not mean that SMEs should be neglected, as they play a crucial role in the Moroccan economy, particularly in terms of employment and economic growth. A balanced approach is therefore needed to support both large companies and SMEs.

Table 2.

Analysis of the cumulative abnormal profitability of SMEs and large companies.

Event windows	Cumulative abnormal yields (%)			
	SME (%)	T-test	Larges enterprises (%)	T-test
(AD-30; AD-1)	-4,141	(-1,2138)	-5,729***	(-3,1662)
(AD-25; AD-1)	-5.685**	(-1.8252)	-5.233***	(-3.1146)
(AD-20; AD-1)	-5.307**	(-1.9051)	-3.969***	(-2.6415)
(AD-15; AD-1)	-5.206**	(-2.1578)	-3.067***	(-2.3569)
(AD-5; AD-1)	-5.714***	(-4.1022)	-2.682***	(-3.5698)
(AD-1; AD)	-5.568***	(-6.3209)	-3.093***	(-6.5104)
AD	-0,735	(-1,1812)	-0,0546	(-0,1625)
(AD-3; AD+3)	-11.220***	(-6.8078)	-4.325***	(-4.8654)
(AD-2; AD+2)	-10.418***	(-7.4791)	-4.354***	(-5.7943)
(AD-1; AD+1)	-6.304***	(-5.8430)	-3.148***	(-5.4096)
(AD; AD+30)	-8.314***	(-2.3972)	-3.454*	(-1.8462)
(AD; AD+60)	3.617	(0.7434)	2.215	(0.8441)
(AD+10; AD+20)	2.942	(0.5248)	0.797	(0.2634)
(AD+20; AD+30)	1.870	(0.5004)	0.567	(0.2815)
(AD+30; AD+50)	1.870	(2.0347)	4.423*	(1.7592)

Note: ***, **, * indicate significance levels of 1%, 5% and 10% respectively.

5. Conclusion

This study highlighted the differentiated impact of the COVID-19 pandemic on SMEs and large companies listed on the Casablanca Stock Exchange. Applying event study methodology, the results showed that SMEs suffered greater and more prolonged declines in stock market returns than large companies, which demonstrated greater resilience. SMEs, because of their smaller size and less

diversification, are more vulnerable to external shocks such as the pandemic, whereas large companies, thanks to their financial and organizational resources, were better able to absorb the initial shock and bounce back more quickly. Furthermore, this study highlights the need for further research into the impact of economic crises on different sectors of the economy, in order to better understand the resilience mechanisms specific to different company sizes. Future studies could also explore the impact of public policies on the resilience of companies and their ability to recover after a crisis, taking into account the specificities of different stock market segments.

The results suggest that risk management and support strategies need to be tailored to the specific characteristics of companies, taking into account their capitalization. Economic decision-makers should pay particular attention to the needs of SMEs in times of crisis, proposing more targeted support measures to strengthen their resilience. In addition, this research opens up prospects for future studies, in particular to deepen understanding of the differentiated responses between business sectors and company types in the context of global crises such as the COVID-19 pandemic.

This work offers valuable lessons for investors, managers and regulators in terms of crisis preparation and management, while highlighting the importance of a differentiated approach between SMEs and large companies in managing stock market volatility.

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