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The impact of the IPO on the stock performance of companies in the industrial and energy sector listed on the Casablanca stock exchange

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Abstract

This study aims to assess the impact of initial public offerings (IPOs) on the stock market performance of Moroccan companies operating in the industrial and energy sectors. It seeks to understand how going public affects profitability, financial structure, and valuation, particularly in the context of an emerging market. The research is grounded in financial theories related to capital structure, corporate governance, agency theory, and signaling. It employs a quantitative approach using econometric models, Generalized Linear Models (GLM), Cross-Sectional Autoregressive Distributed Lag (CS-ARDL), and Ordinary Least Squares (OLS) to evaluate both short- and long-term stock performance. Key variables analyzed include market conditions, liquidity, and stock price volatility. The results indicate a significant improvement in stock returns following IPOs, primarily driven by favorable market conditions and high stock liquidity. However, excessive stock volatility emerges as a detrimental factor, negatively influencing future performance. The findings underscore the dual nature of IPO outcomes: while they can enhance returns in the short term under certain conditions, unmanaged volatility can hinder sustained performance. A nuanced approach is therefore essential for companies considering public listing. This study provides practical insights for industrial and energy firms in Morocco and similar emerging markets. It recommends that firms carefully evaluate market timing and implement measures to manage post-IPO volatility to optimize long-term value creation.

Keywords: Capital structure, Econometric methods, Industrial and energy sector, Stock market listing, Stock market performance.

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1. Introduction

The IPO represents a major strategic step in the development of a company, marking its opening to new financing and expansion opportunities. However, this transition is accompanied by significant challenges, including increased exposure to regulation, an enhanced financial transparency requirement, and greater sensitivity to market volatility. These issues are of particular importance for companies in the industrial and energy sectors listed on the Casablanca Stock Exchange, which are central to the Moroccan economy through their contribution to job creation and their significant weight in national GDP. Often with strong internal control and management involvement, these companies must adapt their management and governance practices to effectively respond to the requirements of financial markets after an IPO.

This work is part of an in-depth analysis of the impact of the IPO on the stock market performance of companies operating in the industrial and energy sectors in Morocco. The main objective is to assess the extent to which this transition influences their performance, capital structure, and valuation in financial markets. Several econometric approaches were used, including the generalized regression model (GLM), the short- and long-term error correction model (CS-ARDL), and the ordinary least squares method (OLS). These methods make it possible to capture the dynamics of performance at different time horizons while integrating the specificities of these companies.

This work is divided into three main parts. The first is devoted to a review of literature, examining theoretical and empirical studies dealing with the impact of IPOs on business performance, especially in emerging economic contexts such as Morocco. This section highlights the main effects of listing, particularly in terms of performance, governance, and share valuation. The second part presents the results of econometric analyses, allowing the identification and quantification of the relationships between quotation and stock market performance, while distinguishing short- and long-term effects. Finally, the third part offers an in-depth discussion of the results, interpreting them in light of the specificities of Moroccan companies listed in the industrial and energy sectors. It highlights funding opportunities and governance challenges in a volatile market environment. Concrete recommendations are provided to executives to optimize post-listing performance.

This work aims to analyze the impact of the IPO on the stock market performance of Moroccan companies operating in the industrial and energy sectors. The objective is to determine the extent to which this transition affects equity returns, capital structure, and valuation of companies in financial markets. To do so, several assumptions were made in order to explore the underlying mechanisms of this transformation, focusing on key variables such as market conditions, securities liquidity, and post-listing volatility.

The epistemological framework of this work is part of a positivist approach, according to which social and economic phenomena can be observed, measured, and analyzed objectively from empirical data. This methodological approach makes it possible to quantify the impact of an IPO by mobilizing rigorous econometric models and testing hypotheses formulated on the basis of theoretical foundations. The reasoning adopted is based on the hypothetical-deductive method, which consists of deducing hypotheses from existing literature and then comparing them with empirical data using statistical analyses. This approach aims to validate or invalidate the assumptions based on the results obtained.

The central problem of this work is:

What is the impact of the IPO on the stock market performance of Moroccan companies in the industrial and energy sectors listed on the Casablanca Stock Exchange?

This question raises several issues related to the impact of stock market listing on the return and stock performance of industrial and energy companies listed on the Casablanca Stock Exchange, incorporating into the analysis both internal company factors and external market determinants.

The assumptions made in this study are as follows:

$H_{1:}$ Favorable market conditions at the time of IPO have a positive effect on long-term post-listing stock performance, measured by equity returns.

$H_{2:}$ High liquidity of equities after IPO is positively correlated with long-term post-listing stock performance.

$H_{3:}$ High volatility in equities after an IPO has a negative impact on long-term post-listing stock performance.

This work attempts to address this problem by analyzing the determinants of the stock market performance of Moroccan listed companies in the industrial and energy sectors. The approach is based on a rigorous methodology, utilizing empirical data and formal testing of assumptions using appropriate econometric models.

2. Theoretical Framework

The impact of IPOs on companies' stock market performance is attracting increasing interest in academic literature, although the results remain partly ambiguous and complex to interpret. The IPO process is a key strategic step in a company's life cycle, offering significant opportunities for financing, visibility, and growth. However, this transition is also accompanied by significant challenges, particularly in terms of transparency, governance, and financial market pressure. Researchers have given considerable attention to whether IPOs lead to a sustainable improvement in performance or whether they create risks that can negatively affect long-term profitability and competitiveness.

On the one hand, numerous studies highlight the benefits that an IPO can offer to companies. The listing is a strategic lever for expanded access to capital, facilitating the financing of growth, innovation, and geographic expansion projects. This additional equity may result in an improvement of key financial indicators, such as equity performance, thereby strengthening the ability of companies to modernize and increase their competitiveness [1].

Furthermore, the IPO is often viewed as a catalyst for strengthening corporate governance. It leads to greater financial transparency, the adoption of more rigorous management practices, and compliance with market standards. This move towards more structured management is considered a key factor in improving long-term performance, particularly through the establishment of stricter internal and external control mechanisms and more demanding reporting systems.

Finally, the IPO enhances companies' credibility with market participants, which can assist in attracting institutional or strategic investors seeking opportunities in companies with high growth potential.

However, these benefits are not systematic and vary according to the specific characteristics of each company. On the other hand, several empirical studies also highlight the risks and constraints associated with stock market listing. One of the main challenges is the pressure from external investors to maximize short-term returns. This dynamic can conflict with the long-term strategy often favored by companies. Indeed, the founding owners of companies are generally motivated by objectives that go beyond immediate profitability, such as the sustainability of the company, intergenerational transmission of values, and preservation of organizational culture.

However, financial markets, which are focused on short-term profitability, are exerting increasing pressure on these firms to adopt a more results-oriented management approach. This may lead to tensions with the founders' long-term goals, which emphasize stability and sustainable growth rather than immediate profit maximization [2].

In addition, this pressure to generate rapid returns can undermine the organizational culture of companies, which is based on strong interpersonal relationships and more informal internal control, perceived by some as an obstacle to the adoption of more institutionalized management practices. Finally, the IPO implies a dilution of internal control, which can lead to conflicts of interest, particularly between founding owners and external shareholders. Lauterbach and Vaninsky point out that these tensions can complicate strategic decision-making, especially when the priorities of external shareholders differ from those of the founders [3].

Another key aspect of the issue concerns the stock market performance of companies after their IPO. Several studies indicate that, in the short term, newly listed companies often have positive abnormal returns, mainly due to market enthusiasm and the novelty effect accompanying these transactions [4]. This initial optimism can be reinforced by the reputation of prudent management, perceived as less risky and more stable, qualities appreciated by investors in an uncertain economic environment. However, these positive returns are generally short-term and tend to diminish over the medium to long term as stock market performance becomes more variable. Equity volatility is often identified as a key factor in this post-IPO heterogeneity. Mishra and McConaughy note that this increased volatility sometimes results from the complexity of governance and internal tensions that may arise between the interests of owners and the expectations of external shareholders. Managing volatility and expectations thus becomes a central issue in preserving the solidity of long-term performance [5].

The way in which companies manage their transition after an IPO is a key factor in their success or failure. Those that succeed in maintaining internal governance while meeting the expectations of institutional investors are more likely to succeed after the IPO. Villalonga and Amit show that companies able to integrate modern governance while maintaining a solid structure tend to maintain good performance even after their introduction [6]. However, this adaptation remains complex. The dilution of ownership, inherent to the IPO, often changes the decision-making dynamics, generating tensions internally and with new shareholders. This can undermine cohesion and strategic alignment, especially when the interests of external shareholders diverge from long-term internal objectives.

The size of the company and its sector also play a key role in the impact of stock market listing on stock market performance. Lauterbach and Vaninsky found that large companies tend to perform better after their IPO because of their ability to attract significant capital, better manage volatility, and adopt more quickly the modern management practices required by financial markets [3]. On the other hand, small firms, which are often more dependent on informal management, may find it more difficult to adapt to the requirements of listing. They may also experience a dilution of their decision-making power, which can affect their flexibility and ability to react quickly to market developments.

In summary, while listing on a stock exchange offers undeniable benefits to companies, such as improved access to capital and increased visibility, it also brings with it considerable risks and challenges. The pressure to maximize short-term returns, governance tensions, and increased equity volatility are potential barriers that could limit the benefits of an IPO. The ability of companies to exploit the benefits of listing while mitigating their risks depends on many factors, including financial market conditions, liquidity, and equity volatility, as well as the quality of post-IPO management. Therefore, companies must approach this transition with rigor and strategy, balancing investor expectations and preserving their long-term vision. Advance planning, adaptation of governance structures, and the establishment of effective control mechanisms will be key levers to ensure the success of industrial and energy companies in financial markets.
The next section will explore this issue through an empirical analysis.

3. Methodology

This study focuses on the contribution of initial public offerings (IPOs) to the stock market performance of companies in the industrial and energy sectors listed on the Casablanca Stock Exchange. The data used in this research primarily comes from secondary sources, including the database and documents provided by the Casablanca Stock Exchange, the websites of the Moroccan Financial Markets Authority, as well as the institutional sites of companies listed on the Casablanca Stock Exchange. These data are essential for conducting a thorough analysis of the role of IPOs in achieving sustainable stock market performance while examining the various factors that may influence this relationship.

The frequency of data collection is annual, and the sample includes 20 listed industrial and energy companies from 1999 to 2011. The analysis was concluded in 2011 for two reasons: no companies from the industrial and energy sectors conducted an IPO between 2012 and 2019, and the analysis period encompasses five years following the IPO. It is important to note that the sampling period was determined based on available data, which may influence the results and conclusions of the study.

Several indicators are used to assess the impact of IPAs on stock market performance. Market conditions serve as an indicator to capture the influence of general stock market fluctuations on company performance, while equity liquidity

assesses the ease with which securities can be traded in the market. Additionally, equity volatility is considered an indicator to understand the risks associated with equity investments.

The stock market performance of companies in the industrial and energy sectors listed on the Casablanca Stock Exchange is measured by the return on shares, which assesses the performance of a company's securities over a specified period. The variables used in the study are presented in the following tables.

Table 1.
Summary of variables used in the study.

Variables	Measure	Abbreviations	Sources	Kind
Stock return	(Current stock price - Initial stock price) / Initial stock price	SR	Ritter [4]	Dependent variable.
Market conditions	Global stock market index.	Market	Ritter [4]	Independent variable
Stock liquidity	Daily traded volume / Market capitalization.	SL	Lauterbach and Vaninsky [3]	Independent variable
Stock volatility	Standard deviation of equity returns	SV	Schulze and McConaughy [5]	Independent variable

The main objective of this study is to analyze the impact of an initial public offering (IPO) on stock market performance, taking into account structural and cyclical factors. In the current global economic context, where financial stability and financial development are key issues, this research seeks to shed light on the relationship between IPOs and key financial indicators.

The methodology adopted in this analysis includes several statistical approaches. Due to the limited sample size, advanced methods cannot be used. Therefore, the study focuses on the direct relationships between the indicators. Specifically, the methodology consists of the following elements:

- **Descriptive statistics:** The analysis begins with descriptive statistics, where the mean and volatility of the sample data are examined. This helps to understand the general characteristics and trends of the data.
- **Stationarity test:** Before conducting cointegration tests, a stationarity test is performed to determine if the data series is stationary. Non-stationary data can lead to spurious results in cointegration analysis. The Augmented Dickey-Fuller (ADF) test or Phillips-Perron (PP) test may be used to assess stationarity. If the data is found to be non-stationary, it may need to be differenced to achieve stationarity.
- **Pedroni and Kao Cointegration:** These tests verify the existence of a long-term relationship between the IPO and the stock market performance of listed industrial and energy companies. Cointegration indicates whether the variables move together over a long period of time, which is essential to assess the stability of the IPO impact.
- **Wooldridge autocorrelation test for errors:** This test is used to detect the presence of autocorrelation in panel model errors. The absence of autocorrelation ensures the validity of econometric results and the reliability of coefficient estimates.
- **Heteroscedasticity test:** This test checks whether the error variance is constant in the model used. Uncorrected heteroscedasticity can distort the results and lead to incorrect inferences regarding the impact of the stock market listing on stock performance.

All analyses are conducted using EViews software, which facilitates comprehensive statistical and econometric analysis. Although the study is constrained by the sample size, the employed methods offer valuable insights into the relationship between IPOs and the stock market performance of companies in the industrial and energy sectors listed on the Casablanca Stock Exchange.

The results of this study could help guide decision-makers and management in the industrial and energy sectors listed on the Casablanca Stock Exchange towards optimal financial strategies and more sustainable management practices, thus promoting sustained economic growth and better allocation of financial resources.

3.1. Formulas and Equation

The econometric models used in this study are designed to examine the impact of several factors on the stock market performance of Moroccan companies in the industrial and energy sectors after their IPO.

$$R_t = \alpha_0 + \alpha_1 Market_t + \alpha_2 Volatility_t + \alpha_3 Liquidity_t + \varepsilon_t$$

Where:

- $\boldsymbol{R_t}$: "Stock Return" measures the performance of a company's stock over a given period, expressing the gain or loss as a percentage relative to the initial price.
- $\boldsymbol{Market_t}$: "Market Conditions" this variable is used to capture the influence of general stock market fluctuations on the performance of companies. This index helps assess how macroeconomic conditions and financial market variations affect the behavior of businesses.
- $\boldsymbol{Volatility_t}$: "Stock Volatility" this variable is crucial for assessing the risk associated with stock investments by quantifying the dispersion of returns around their mean.
- $\boldsymbol{Liquidity_t}$: "Stock liquidity" this variable that is crucial for assessing the ease with which securities can be traded on the market, allowing for the quantification of trading activity relative to the company's total size.

This model examines the factors influencing stock market performance, in particular the volatility risk and the ability of companies to maintain sufficient liquidity.

4. Results and Discussions

4.1. Descriptive Statistics

Table 2.
Descriptive statistics of variables.

Statistics	Stock Return	Market Conditions	Stock Volatility	Stock liquidity
Mean	7.736691	5.735971	12.73165	176.8921
Median	7.7000	5.7000	12.8000	170.0000
Maximum	9.6000	7.0000	14.2000	280.0000
Minimum	6.0000	4.8000	11.6000	140.0000
Std. Dev.	0.7876	0.5487	0.5546	26.9305
Skewness	0.0609	0.8173	0.1481	1.8432
Kurtosis	2.4829	3.3889	2.3523	6.6918
Jarque-Bera	7.40	10.12	8.50	9.33
Probability	0.010	0.010	0.030	0.020
Sum	1075.40	797.30	1769.70	24588.00
Sum Sq. Dev.	85.60	40.82	42.41	10081.40
Observations	139	139	139	139

This table presents descriptive statistics for four variables: Stock Return, Market Conditions, Stock Volatility, and Stock Liquidity, based on a sample of 139 observations. The results show an average equity return of 7.74%, indicating a generally stable and positive stock market performance for companies in the sector. Market conditions average 5.73, with low dispersion, reflecting a relatively stable stock market environment during the period under review.

Equity volatility, averaging 12.73%, indicates a moderate risk associated with listed securities and an approximately symmetrical distribution. In contrast, equity liquidity exhibits greater variability, with a notable right skewness (skewness = 1.84), suggesting that some securities are significantly more liquid than the average.

The Jarque-Bera test indicates that some variables, such as returns and volatility, are close to a normal distribution, while others, such as liquidity, diverge significantly. This may impact the validity of certain statistical assumptions used in econometric models.

4.2. Stationarity Test

Table 3.
Results of unit root tests (ADF and PP - Fisher chi-square).

Variable	Test	Level	P-value	1st difference	P-value
Stock Return	ADF—Fisher chi-square	10.932	0.3121	64.329	0.0000***
	PP—Fisher chi-square	10.678	0.2113	35.789	0.0000***
Stock Volatility	ADF—Fisher chi-square	5.998	0.0003***	12.665	0.0341**
	PP—Fisher chi-square	7.564	0.1287	12.345	0.0214**
Stock liquidity	ADF—Fisher chi-square	3.875	0.5581	21.225	0.0041***
	PP—Fisher chi-square	22.897	0.1204	39.876	0.0000***
Market Conditions	ADF—Fisher chi-square	7.567	0.2341	29.876	0.0004***
	PP—Fisher chi-square	6.432	0.5323	34.123	0.0000***

The results of unit root tests applied to the variables Stock Return, Stock Volatility, Stock Liquidity, and Market Conditions indicate that all series are not stationary at the level but become stationary after the first difference. The ADF-Fisher chi-square and PP-Fisher chi-square tests confirm this conclusion: p-level values are greater than 0.05 for the majority of cases, indicating the absence of initial stationarity, while after differentiation, the p-values fall significantly below 0.05, often to 0.0000, which confirms stationarity at the first difference.

This means that the variables follow a first-order integration process (I(1)), an essential condition for avoiding fallacious regressions. These results justify the use of econometric approaches adapted to non-stationary data, such as ARDL models or cointegration tests, in order to ensure robust and reliable analyses.

4.3. Cointegration Test

Table 4.
Panel unit root test results (stationarity statistics).

Test	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.276	0.1014	-1.098	0.1221
Panel rho-Statistic	-2.765***	0.0052	-2.983***	0.0023
Panel PP-Statistic	-3.987***	0.0001	-3.655***	0.0003
Panel ADF-Statistic	-2.843***	0.0045	-2.567***	0.0067
	Statistic	**Prob.**		
Group rho-Statistic	-1.134	0.2175		
Group PP-Statistic	-3.456***	0.0006		
Group ADF-Statistic	-2.489***	0.0078		

Table 5.
Kao cointégration test.

Test	t-Statistic	Probability
ADF	-2.035**	0.0213**

The results of the Pedroni co-integration test in Table 4 show strong evidence of co-integration between the variables studied. The test is divided into several statistics (V, rho, PP, and ADF), each allowing for the evaluation of the presence of long-term relationships between series.

The Pedroni cointegration test evaluates the existence of a long-term relationship between the variables studied through several panel statistics.

The v-Statistic Panel, with a value of -1.276 and a p-value of 0.1014, is not significant at the conventional threshold of 5%, but suggests a slight indication of co-integration at a threshold of 10%. The weighted version of this statistic gives a value of -1.098 with a p-value of 0.1221, which confirms the non-significant character, but is still close to a low tolerance threshold.

The rho-statistic Panel, with a statistic of -2.765 and a p-value of 0.0052, is highly significant at the 1% threshold, indicating strong evidence of co-integration between variables. This conclusion is reinforced by the weighted version, which shows a statistic of -2.983 and a p-value of 0.0023, confirming the stability of the long-term relationship.

The PP-Statistic Panel provides even stronger evidence of cointegration, with a statistic of -3.987 and a p-value of 0.0001. This result is highly significant, indicating that the variables are strongly correlated in the long term. The weighted version also shows a significant statistic of -3.655 with a p-value of 0.0003, which supports this conclusion.

The ADF-Statistic Panel also indicates a long-term relationship, with a statistic of -2.843 and a p-value of 0.0045, which is significant at the 1% level. The weighted result (-2.567; p-value 0.0067) confirms that the null hypothesis of no cointegration can be rejected with high confidence.

On the group statistics side, the results are consistent:

- The rho-statistic Group is not significant (p-value of 0.2175),
- But the Group PP-Statistic (-3.456; p = 0.0006) and the Group ADF-Statistic (-2.489; p = 0.0078) are highly significant, confirming cointegration in an inter-individual perspective.

In summary, the majority of Pedroni statistics indicate a strong presence of cointegration between long-term variables, justifying the use of econometric models adapted to stable relationships, such as error correction models (ECM) or ARDL models based on panel data.

The Kao cointegration test, based on ADF statistics, shows a t-statistic of -2.035 with a p-value of 0.0213, which is significant at the 5% threshold. This result indicates the existence of a stable long-term relationship between the variables studied, thus confirming the presence of cointegration. It supports the conclusions of the Pedroni test, reinforcing the idea of a lasting structural interdependence between the time series of the panel.

In summary, the results of these cointegration tests suggest that the variables studied evolve together over the long term, which could indicate that they are influenced by common factors during the period analyzed. This validates the idea that companies in the industrial and energy sectors listed in Morocco react consistently to similar market conditions, particularly when considering factors such as equity volatility and general market conditions.

These results are consistent with the literature on cointegration in the context of emerging financial markets. According to Pedroni, the presence of cointegration in dynamic cross-sectional data panels is a key indicator of long-term relationships [7] while Kao highlights the robustness of ADF testing in such contexts [8].

4.4. Estimation Model

Table 6.
Regression Results – Dependent Variable: Stock Return.

Dependent variable.: Stock return	OLS	CS-ARDL
Long term coefficients		
Market Conditions	0.045***	0.039***
Stock liquidity	7.110***	4.212***
Stock Volatility	-0.027***	-0.032***
Short term coefficients		
Error correction term (-1)	0.60***	0.92***
D(Market conditions)	5.450**	6.810***
D(Stock liquidity)	0.081**	0.075**
D(Stock volatility)	-0.045**	-0.049**

The performance of listed stocks in the Moroccan industrial and energy sectors is a key issue in assessing how financial market dynamics influence company value creation. The table above presents the results of two econometric models, OLS and CS-ARDL, to estimate the impact of market conditions, equity liquidity, and volatility on stock returns. This interpretation explores both long-term and short-term effects, highlighting the implications for listed companies in an emerging market context like Morocco.

In the long term, market conditions have a positive and highly significant effect on stock returns (0.045 in OLS and 0.039 in CS-ARDL). This suggests that when the overall Moroccan stock market performs well, the returns of industrial and energy stocks also increase. Such results align with the theory of systematic risk exposure [9], where stocks tend to co-move with broad market indices, especially in relatively small and integrated markets like Morocco's.

Equity liquidity is another major driver of stock returns, with coefficients of 7.110 (OLS) and 4.212 (CS-ARDL). This indicates that more liquid stocks, i.e., those that are more actively traded and easier to buy or sell without impacting the price, tend to generate higher returns. These results echo the findings of Amihud and Mendelson and Pastor and Stambaugh, who demonstrate that investors demand a premium for holding illiquid stocks, leading to a positive relationship between liquidity and performance [10, 11].

Conversely, volatility exerts a significant and negative effect in both models (-0.027 in OLS and -0.032 in CS-ARDL), indicating that uncertainty surrounding stock prices reduces expected returns. This result is consistent with risk aversion theory, whereby investors penalize stocks with unpredictable returns. In emerging markets, where macroeconomic or political shocks can be more frequent, volatility remains a key determinant of investor behavior [12, 13].

In the short term, all three variables also have significant effects, although their magnitudes differ. The error correction term (ECT) is significant and positive (0.60 in OLS and 0.92 in CS-ARDL), indicating that deviations from long-term equilibrium are corrected rapidly, particularly in the CS-ARDL model, where 92% of the disequilibrium is adjusted within a single period. This rapid adjustment reflects strong market responsiveness and possibly the presence of efficient internal mechanisms or informed investors who quickly realign prices with fundamentals.

Short-term changes in market conditions (5.450 in OLS and 6.810 in CS-ARDL) significantly increase stock returns, indicating a strong reactivity to macro-financial trends. Similarly, short-term improvements in liquidity (0.081 and 0.075, respectively) positively affect returns, even if the effect is smaller than in the long term, suggesting that investors still reward stocks that can be traded easily, even in the short run.

Meanwhile, volatility continues to exert a negative effect (-0.045 and -0.049), confirming that short-term uncertainty is penalized by investors. These findings support the models of Engle and French et al., which show that volatility increases the required rate of return and lowers stock prices accordingly [14, 15].

Overall, the analysis highlights that stock returns in the Moroccan industrial and energy sectors are sensitive to both market-wide factors and company-specific attributes, especially those related to liquidity and volatility. The results suggest that:

Firms that enhance stock liquidity, such as through better investor relations, more transparent disclosures, or increased trading volumes, are likely to see better stock market performance.

Conversely, managing volatility through predictable earnings, transparent governance, or prudent financial policies can help sustain investor confidence and stock value.

The strong short-term correction mechanism (particularly in the CS-ARDL model) indicates that, despite the structural challenges of emerging markets, the Moroccan stock market shows signs of efficient adjustment to shocks.

In conclusion, listing on the stock exchange offers significant potential for industrial and energy companies in Morocco to enhance their visibility and stock performance, provided they maintain liquidity, minimize volatility, and align with broader market trends. The dual influence of long-term fundamentals and short-term sensitivity underscores the importance of strategic financial communication, robust governance, and operational stability in sustaining shareholder value.

Table 7.
Regression Results – Dependent Variable: Stock Return.

Dependent variable.: Stock return	Coefficient	Std. Error	z-Statistic	Prob.
Market Conditions	1.440712	0.111806	12.88583	0.0000
Stock liquidity	0.004343	0.001657	2.620752	0.0098
Stock Volatility	-0.474760	0.112962	-4.202837	0.0000
C	4.748969	0.988812	4.802701	0.0000

The results from the generalized linear model (GLM) provide significant insights into the factors influencing stock returns of listed companies. Each of the variables considered, market conditions, stock liquidity, and stock volatility, has a notable impact on stock returns.

Market conditions have the strongest positive effect, with a coefficient of 1.440712 and a z-statistic of 12.88583 (p-value of 0.0000). This result indicates a robust and highly significant relationship between market conditions and stock returns. Specifically, favorable market conditions lead to an increase in stock returns, confirming the role of overall economic and market factors in driving investor sentiment. Such findings are consistent with the literature that emphasizes the importance of broader market environments in determining stock performance. When market conditions improve, investor confidence typically rises, leading to higher stock valuations [9].

Stock liquidity also shows a significant positive effect, with a coefficient of 0.004343 and a z-statistic of 2.620752 (p-value of 0.0098). This indicates that greater liquidity in the stock market is associated with higher stock returns. This result supports earlier studies, such as those by Amihud and Mendelson [10], which suggests that more liquid stocks tend to offer higher returns because investors are willing to pay a premium for assets that are easier to trade without impacting their price [10]. This finding is particularly relevant in emerging markets like Morocco, where liquidity can often be a challenge but plays a crucial role in enhancing market efficiency and attracting investment.

Stock volatility has a significant negative impact on stock returns, with a coefficient of -0.474760 and a z-statistic of -4.202837 (p-value of 0.0000). This suggests that increased volatility in the stock market leads to lower returns, highlighting investors' risk aversion. Investors typically demand higher returns to compensate for the uncertainty associated with volatile stocks. This result aligns with Black and Bollerslev, who both discuss how volatility increases risk and thereby discourages investment in more volatile assets [12, 13].

Intercept (C) has a positive coefficient of 4.748969 (p-value 0.0000), indicating that in the absence of explanatory variables, equity returns have a significant reference level. This positive constant suggests that even in the absence of favorable conditions (market, liquidity, and volatility), stock market performance exhibits a positive drift, possibly driven by investor expectations or other unmodeled factors.

In summary, the results indicate that market conditions are the most influential factor driving stock returns, with stock liquidity also playing a significant role in boosting returns. On the other hand, stock volatility dampens returns, highlighting investors' risk aversion. These results align with Fama and French on the importance of market-wide conditions and with Amihud and Mendelson on liquidity's positive influence on returns [9, 10]. Finally, the negative relationship between volatility and stock returns is consistent with classical theories of risk and investor behavior. The findings suggest that in emerging markets like Morocco, a stable and liquid market environment with lower volatility is crucial for enhancing stock market performance.

4.5. Discussion

Macroeconomic conditions play a crucial role in the performance of equities, as suggested by Fama, who points out that favorable market conditions have a positive influence on equity returns [16]. Lintner and Sharpe have also demonstrated that global economic conditions influence investor perceptions and, consequently, stock valuations [17, 18]. This dynamic is particularly significant for companies in the industrial and energy sectors, which are often perceived as more stable during periods of economic growth. Indeed, a prosperous economy provides an enabling environment for business profitability, which improves investor confidence and ultimately returns.

Equity liquidity is a key factor in stock market performance, supporting Amihud and Mendelson's thesis that more liquid stocks are more attractive to investors [10]. This is due to the reduced transaction costs, which facilitate investors' entry and exit from the market. In the context of listed companies in Morocco, greater equity liquidity could allow investors to better manage their positions, thus increasing demand and improving returns. Increased liquidity could also enhance market stability, attract more institutional investors, and strengthen overall investor confidence.

Volatility has a negative impact on equity returns, in line with the classic theory of risk and return. Campbell et al. [19] explain that increased volatility is perceived as a higher risk indicator, leading investors to demand a higher risk premium [19]. Although enterprises in the industrial and energy sectors are generally regarded as more stable, they may nevertheless be exposed to perceived higher risks due to the concentration of ownership or uncertainties related to internal governance. This volatility could negatively impact stock market performance, justifying the need for strategies to reduce perceived risks.

Corporate governance is a key factor in reducing risk perception. Shleifer and Vishny emphasize the importance of transparent and effective governance to enhance investor confidence [20]. Companies in the industrial and energy sector listed in Morocco should implement rigorous governance practices, such as more detailed financial reporting and clear communication strategies. This would reduce investors' concerns about the management and stability of companies, thus helping to improve their stock market performance.

Amihud and Mendelson also demonstrated that liquidity plays a key role in the attractiveness of equities [10]. Companies listed in the industrial and energy sectors in Morocco could consider releasing more free float to increase the liquidity of their

shares. This would facilitate market access for investors, increase demand for their securities, and thus improve stock returns. Improved liquidity could also enhance market stability and attract more investors seeking investment opportunities with low transaction costs.

Fama and Lintner recommend that companies should closely monitor macroeconomic indicators and adjust their strategies to market developments [16, 17]. Listed industrial and energy companies should therefore focus on strategic management that adapts quickly to economic changes in order to maximize their stock market performance. Continuous monitoring of market conditions, proactive management of equity liquidity, and reduction of perceived risks through improved governance could significantly improve their returns.

The results of this analysis show that market conditions, equity liquidity, and volatility have a significant impact on the performance of shares of companies in the industrial and energy sectors listed in Morocco. In particular, favorable market conditions and increased liquidity have a positive effect on returns, while volatility has a negative impact. To optimize their stock market performance, these companies need to implement strategies aimed at improving governance, increasing the liquidity of their shares, and closely monitoring market developments. Effective management of these key factors will enhance their attractiveness to investors and contribute to sustained long-term market performance.

In the Moroccan context, the listing on the stock exchange of companies in the industrial and energy sectors is particularly important because of their prominence in the national economic fabric. Indeed, these enterprises represent about 80% of the total Moroccan enterprises, contributing significantly to job creation and gross domestic product (GDP). However, despite this importance, they are often characterized by conservative management and a reluctance to open up to the stock market. This reluctance limits their access to external financing and hampers their growth in an increasingly competitive global economic environment. Market conditions, therefore, play a decisive role for these companies when they consider listing on the stock exchange.

The Casablanca Stock Exchange, although still in development, is a key vehicle for financing Moroccan companies. It offers companies the opportunity to access new sources of financing, improve their governance, and diversify their sources of capital. However, companies in the Moroccan industrial and energy sectors are often reluctant to dilute their internal control, which partly explains the low proportion of listed companies.

The impact of market conditions on the performance of companies in the industrial and energy sectors listed on the Casablanca Stock Exchange is significant. When the market is stable and growing, these companies benefit from better stock market valuations. The Moroccan market has demonstrated particular resilience, as evidenced by the positive performance of the MASI index during periods of economic stability. In this context, companies in the industrial and energy sectors considering listing can take advantage of these favorable conditions to improve their performance and attract more investors.

One of the major challenges for companies in the industrial and energy sectors listed in Morocco remains the low liquidity of their shares. Historically, the Casablanca Stock Exchange has suffered from a lack of liquidity, which limits the volume of transactions and discourages investors, especially international ones. However, for Moroccan companies that choose to go public, improved equity liquidity would be an essential lever to attract the attention of local and foreign investors. Improved liquidity would also enhance the visibility of these companies on the international stage, which could boost stock market returns and strengthen the position of Moroccan industrial and energy companies in financial markets.

Equity volatility remains a significant risk factor for listed companies, particularly in emerging markets such as Morocco. These markets are often characterized by higher volatility due to their sensitivity to global economic fluctuations and political events. This volatility may discourage some companies from going public, as it can negatively impact the valuation of their shares.

In order to minimize these risks, it is essential to improve the transparency and governance of listed companies, which would enhance investor confidence and reduce volatility in share prices. Stronger corporate governance would not only reassure investors but also provide more effective risk management mechanisms, contributing to long-term market stability.

4.6. Autocorrelation Test for Errors In Search Models

In the context of panel data, several problems may arise, including autocorrelation of errors. This occurs when the error terms of different periods are correlated, or when errors in a given period influence those of subsequent periods. This may reduce the effectiveness of estimates. To detect this problem, we use the Wooldridge test, which is based on the null hypothesis (H0) stipulating the absence of autocorrelation of errors. Based on the probability associated with this test, presented in the tables below, we will determine whether or not autocorrelation of errors is present.

Table 8.
Wooldridge test for autocorrelation in panel data.

Model	**Stock return, Market Conditions, Stock liquidity, Stock Volatility**
Statistical F(1, 10)	1.994
Probability > F	0.1891

The Wooldridge test yields an F value of 1.994 and a probability of 0.1891. Since the probability is well above the threshold of 0.05, we cannot reject the null hypothesis that there is no first-order autocorrelation. This indicates that, in this model, the residuals do not exhibit significant temporal correlation, ensuring that econometric results are not biased by autocorrelation in errors.

4.7. Heteroscedasticity Test in the Research Model

In this section, we examine whether the variance of errors remains constant for each individual within our study's model. To do this, we utilize the heteroscedasticity test, which is based on the null hypothesis of homoscedasticity, meaning the variances of the errors are equal. Depending on the probability associated with this test, we will either confirm or reject this hypothesis. The heteroscedasticity test is conducted using the xttest3 command for models estimated with the fixed effects method and the estat hettest command for models estimated with the random effects method. The results of this test for the model are presented in the table below.

Table 9.
Modified Wald Test for Groupwise Heteroskedasticity (Fixed Effects Model).

Model	Test used	chi2 (df)	Prob > chi2	Conclusion
Stock Return ~ Market Conditions + Stock Liquidity + Stock Volatility	Modified Wald test for groupwise heteroskedasticity	**3.10**	0.0782	The null hypothesis of homoscedasticity is not rejected. No heteroskedasticity detected.

The modified Wald test for the model indicates a chi-squared value of 3.10 with a probability of 0.0782. Although this probability is close to the 0.05 threshold, it remains higher, which means we do not reject the hypothesis of homoscedasticity. Therefore, we also note the absence of heteroscedasticity in this model, supporting the reliability of the estimates.

Recommendations specific to the Moroccan context:

- Stimulate IPOs for Industrial and Energy Sector Companies: To encourage more Moroccan industrial and energy companies to go public, tax incentives could be implemented, along with support programs to assist these companies throughout the listing process. The government and the Casablanca Stock Exchange should collaborate to create an incentive framework that reduces IPO costs and makes this option more attractive for companies.
- Strengthening liquidity in the Moroccan market: Improving liquidity is essential to attract international investors and encourage frequent transactions. The Moroccan financial authorities could consider measures to enhance the participation of institutional investors and promote financial instruments such as ETFs (Exchange-Traded Funds), which facilitate better liquidity of shares.
- Managing volatility risks: Given the negative impact of volatility on the returns of listed industrial and energy sector companies, measures must be put in place to manage this volatility. This could include the implementation of hedging tools and financial derivatives, as well as sector diversification to reduce exposure to sector-specific risks.
- Strengthening corporate governance: Moroccan companies in the industrial and energy sectors should enhance their governance practices to reassure investors and mitigate risk perceptions. Initiatives to improve financial transparency, such as adopting international reporting standards and including independent directors on boards, are essential for attracting sustainable investment.
- Promote financial education and the role of the stock exchange: There is a need to develop a stronger stock market culture in Morocco. This involves awareness and financial education campaigns aimed at explaining to companies in the industrial and energy sectors the advantages of listing on the stock market, while demystifying processes and reducing fears related to loss of control.

Companies in the Moroccan industrial and energy sector have much to gain from entering the stock market, especially in terms of increased liquidity, better governance, and access to additional financing. However, to maximize these benefits, some challenges need to be overcome, including stock volatility and a lack of market liquidity. Adopting strategic reforms and improving risk management could make the Casablanca Stock Exchange a more attractive tool for companies in the industrial and energy sectors wishing to accelerate their growth and strengthen their competitive positions, both nationally and internationally.

5. Conclusion

The conclusion of this work highlights the main results of the study on the impact of stock exchange listing on the stock market performance of companies in the industrial and energy sectors listed in Morocco. Several econometric methods and models were used, including OLS, CS-ARDL, and GLM, to ensure a thorough analysis of short- and long-term dynamics. The study analyzed the results obtained for key indicators of stock market performance through equity returns, allowing a more comprehensive view of the impact of stock exchange listing on these companies.

The results indicate that stock market listing generally enhances equity returns; however, this effect is highly dependent on the management of market conditions, liquidity, and equity volatility. Over the long term, market conditions and equity liquidity positively influence stock returns, providing companies with better valuation and increased operational flexibility. Conversely, equity volatility has a significant negative impact on performance, emphasizing the importance for companies to implement risk management strategies to mitigate this effect.

Short-term results show that stock market listing leads to an immediate response of equity returns to changes in market conditions and liquidity, with significant positive effects. In particular, market conditions and equity liquidity have a direct and positive impact on short-term stock returns, showing that an improvement in these factors can quickly boost equity performance. However, equity volatility continues to have an immediate negative effect, suggesting that market uncertainty and perceived risks by investors may be detrimental to short-term equity performance. The ability of companies to react quickly to market fluctuations and adjust their risk management strategies is, therefore crucial for optimizing short-term stock

returns.

In summary, this study demonstrates that stock market listing acts as a lever for stock market performance among companies in the industrial and energy sectors listed in Morocco. However, it necessitates rigorous risk management related to stock market volatility. The indicators' results offer a better understanding of the differentiated effects of listing on these companies' stock market performance. The application of multiple econometric models has enriched the analysis and provided a comprehensive view of the determinants of their short- and long-term performance.

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