

EXPLORING THE EFFECT OF STOCK MARKET DEVELOPMENT DETERMINANTS ON THE COST OF EQUITY CAPITAL: THE CASE OF TUNISIAN LISTED FIRMS

*Ibtissem Missaoui, Jaleleddine Ben Rejeb, Aymen Ben Rejeb**

Abstract

This paper investigates the effects of stock market development determinants on the cost of equity capital of non-financial Tunisian listed companies. We use a sample includes 24 Tunisian listed firms observed over the period 2007–2016, resulting in a total of 240 firms-year observations. The empirical results reveal that the performance has a significant positive effect on the cost of equity capital. Additionally, various factors such as turnover rate, price spread, stock market capitalization, value of traded shares, volatility of financial asset prices, leverage, dividend policy, size, and inflation all have varying effects on the cost of equity capital. The findings align with existing literature and provide insights into the relationship between various financial factors and Tunisian companies' equity capital costs. This paper offers an important implication for investors, policymakers, and market participants to make informed decisions regarding investment opportunities and the overall development of the stock market.

Keywords: stock market development, cost of equity capital, asset pricing, Tunisian listed firms.

JEL Classification: G21; G28.

Introduction

In recent years, Tunisia's stock market has experienced notable growth and development, increasingly positioning itself as a key platform for capital mobilization and investment facilitation (Jeribi et al., 2015; Saad, 2024); Souffargi and Boubaker (2024). As the market continues to evolve, understanding the factors that influence its dynamics has become essential for policymakers, investors, and researchers. A central element in this context is the cost of equity capital, which represents the return required by investors to compensate for the risk associated with equity investments. Asset pricing models, such as the Capital Asset Pricing Model (CAPM) developed by Sharpe (1964), typically rely on two key variables: the risk-free rate and the asset's sensitivity to market risk (beta). According to CAPM, the expected return on an asset is linearly related to these variables. However, numerous empirical studies have asked the adequacy of such models in ensuring efficient asset pricing. For instance, Smith (1977) found evidence of persistent asset underpricing, raising

* Ibtissem Missaoui, Jaleleddine Ben Rejeb and Aymen Ben Rejeb are at the Higher Institute of Management, University of Sousse, Sousse, Tunisia.

E-mails: missaouiibtissem513@gmail.com;

aleleddinebjaleleddine@gmail.com;

benredjeb_aymen@yahoo.fr.

concerns about the validity of traditional pricing frameworks. Brav (2003) further introduced the concept of market indeterminacy, a condition in which it becomes impossible to determine whether an asset is efficiently or inefficiently priced. This perspective challenges the foundational assumptions of asset pricing models and underscores the complexity of accurately assessing equity value in evolving and imperfect markets such as Tunisia. Simlai (2021) found that empirical tests of linear asset pricing models show presence of mispricing in asset pricing. Asset pricing is considered efficient when market prices fully reflect all available information, such that no informed trader can consistently achieve returns that outperform the market or uninformed participants (Yang & Li, 2013).

The main objective of our study is to contribute to the existing literature on stock market development and cost of equity capital by providing empirical evidence from the Tunisian context. The study covers the period from 2007 to 2016 and using sample of 24 listed Tunisian companies. By analyzing various determinants, such as market size, liquidity, regulations, and investor protection, we seek to provide valuable insights into the relationship between these factors and the cost of equity capital. The choice to focus on Tunisian listed firms is justified by the unique nature of the Tunisian stock market, which operates within a developing economy (Saad, 2024). To achieve our objective, we will employ a quantitative research methodology, utilizing a comprehensive dataset covering a significant time period. We will employ various statistical techniques, such as regression analysis, to empirically test the relationship between the determinants of stock market development and the cost of equity capital.

As a result, our research contributes to better understanding of financial market in time of major political crisis, notably in the context of Arab spring (Tunisian revolution). They are of great importance for policymakers, investors, and firms in Tunisia, as they can contribute to the formulation of effective strategies to enhance stock market development and reduce the cost of equity capital. The study found that performance has a significant positive effect on the cost of equity capital for Tunisian companies listed on the stock exchange. Additionally, factors such as turnover rate, price spread, stock market capitalization, value of traded shares, volatility of financial asset prices, leverage, dividend policy, size, and inflation all have varying effects on the cost of equity capital. The results suggest that factors such as turnover rate, price spread, volatility of financial asset prices, leverage, and dividend policy significantly impact the cost of equity capital. The findings align with existing literature and provide insights into the relationship between various financial factors and Tunisian companies' equity capital costs.

This paper sheds light on the factors influencing the cost of equity capital in the Tunisian stock market and provides valuable insights for investors, firms,

and policymakers in formulating strategies to enhance stock market development. By understanding these determinants, stakeholders can work towards creating a more vibrant and efficient stock market, ultimately boosting economic development in Tunisia.

The subsequent sections of the paper are organized as follows. Section 2 presents an overview of the related literature. Section 3 outlines the research methodology used in this study. Section 4 discusses and analyzes the empirical findings. Finally, section 5 concludes the paper.

1. Literature review and hypothesis development

In recent years, the corporate financial performance has become a focal point for several researchers, particularly the emerging markets where structural and institutional dynamics significantly influence firm outcomes (Missaoui & Brahmi, 2025; Simlai, 2021). A growing body of literature seeks to identify and analyze the determinants of the contribution of such financial market. Furthermore, the link between strategy and finance shows a close connection between the company's strategic situation and its performance. These studies underscore the importance of aligning financial decisions with broader strategic goals, especially in environments characterized by volatility and limited access to capital.

In Tunisia, the strategic-financial nexus is particularly pronounced due to the underdevelopment of the capital market (Saad, 2024; Souffargi & Boubaker, 2024). While the stock exchange offers theoretical advantages such as diversified funding sources and reduced dependency on traditional banking, most domestic firms continue to rely heavily on bank credit as their primary external financing channel. This reliance is partly attributed to the emerging stage of the Tunisian stock market, which is delayed by issues such as information asymmetry, low liquidity, and higher costs of transaction (Meskini & Chaibi, 2024; Missaoui & Alduraywish, 2023; Saad, 2024). These structural inefficiencies limit the market's capacity to serve as a viable financing alternative, thereby shaping firms' capital structure decisions.

Several financial empirical evidence from Tunisia reveals that firm-specific characteristics such as profitability, asset tangibility, and size play a critical role in determining leverage levels (Mansali & Daadaa, 2018; Meskini & Chaibi, 2024; Missaoui & Alduraywish, 2023; Missaoui & Brahmi, 2025; Psillaki & Daskalakis, 2008; Saad, 2024; Yadav et al., 2021). These findings are consistent with the trade-off and pecking order theories, which suggest that firms balance the costs and benefits of debt based on internal financial metrics and market conditions (Missaoui & Alduraywish, 2023; Missaoui & Brahmi, 2025). Moreover, macroeconomic factors such as interest rates, inflation, and unemployment have been shown to exert significant influence on capital structure decisions, particularly in the context of publicly traded Tunisian firms.

(Missaoui & Alduraywish, 2023). The Tunisian case illustrates the broader challenges faced by emerging markets in developing efficient financial systems. Despite policy efforts to modernize the financial sector and attract foreign investment, structural reforms remain incomplete, and the capital market continues to lag behind its regional peers (Baghdadi & Labidi, 2023). As such, understanding the determinants of financial performance and capital structure in Tunisia requires a nuanced approach that considers both firm-level dynamics and systemic constraints.

The investigation of this relationship has played a major role in recent research (Abaidoo & Agyapong, 2024; Chowdhury & Maung, 2012; Masoud & Hardaker, 2012; Missaoui & Brahmi, 2025; Montes & Oliveira, 2025). Economists have long understood that financial development affects economic growth. This can be explained by the tendency of companies to rely on external financing. Financial development helps companies obtain external financing at a low cost (Colombo & Grilli, 2005). It provides the right measure for financing companies. Furthermore, it ensures that investors achieve high returns. The financial market facilitates access to credit at a low cost. It also helps new companies enter the market (Colombo & Grilli, 2005). A developed financial system plays an important role in improving the services of financial intermediaries by reducing transaction and information control costs. It identifies good investment opportunities, mobilizes savings, encourages transaction activities and mitigates risks. Hail and Leuz (2006) emphasize that quality information disclosures increase returns and reduce the cost of equity capital. Masoub (2013) announce that the development of the stock market supports technical innovations, long-term investments, and improves the return on investments. High liquidity, efficient capital allocation, and technological innovation reduce investment risk. Therefore, this eliminates additional demand for a premium from investors to take on additional risk. However, the speed of adaptation to this process depends on specific factors related to the company (difficulty of financing, company valuation in the capital market, company size, profitability, and leverage) and the macroeconomic conditions of countries. As a result, we propose the following hypothesis:

Hypothesis 1: Stock market development has impact on the cost of equity capital.

To test the effect of the determinants of financial market development on the cost of equity capital of listed Tunisian companies, we have derived the following sub-hypotheses:

An investment cannot be separated from its risk (uncertainty) since the investment decision can lead to unexpected profit. Rational investors, before making an investment decision, must consider two things, namely the expected return and the risk that depend on the type of investment. Investment risk is generally classified into two types of investment risks: non-systematic risk and

systematic risk. Non-systematic risk originates from factors specific to a particular company or a group of similar companies, and is often influenced by issues such as the liquidity of the company's securities (Shahed & Shohana, 2022). According to portfolio theory, investors expect a particular return by investing their funds in the form of stocks or other securities. Investing funds entails a risk to be assumed. Therefore, to reduce the risk, investors can diversify the investment of their funds. Furthermore, Jonathan and Lorie (2007) observes that an increase in the return of financial securities results in a rise in the cost of equity capital for a company. Herwany et al. (2014) found a positive correlation between returns and risks. Simlai (2021) argue that investors impose a risk premium compensating for the risk of mispricing the return on assets. Therefore, increased disclosure mitigates the risk of mispricing, increases returns, and reduces the cost of capital.

Barry and Brown (1984) suggest that information produced by a company helps to reduce the risk of error and the cost of equity. Nadarajah et al. (2018) examined the relationship between stock market liquidity and capital structure. They found that companies with more liquid equity have less leverage. Furthermore, they show that stock market liquidity reduces financing costs. Some studies have demonstrated that financial communication of a company plays a very important role in the evolution of the cost of equity (Ajina et al., 2015; Cheriyan & Lazar, 2019; Diamond & Verrecchia, 1991; Hail & Leuz, 2006; Psillaki & Daskalakis, 2008). Beyer et al., (2010) argue that transparency in financial information helps reduce uncertainty (expectation and risk) faced by investors in allocating future cash flows. Another interesting paper by Diantimala et al. (2022) argue that increased public disclosure of information decreases information asymmetry, increases return levels, and therefore leads to a lower cost of capital. emphasize that the relevance and transparency of quality information disclosure help to mitigate information asymmetry and attract investors to invest more, thereby reducing companies' financing costs. As a result, we propose the following hypothesis:

Hypothesis 1.1: The dividend policy has a positive effect on the cost of equity capital.

The turnover rate is considered a relevant indicator of financial market activity because it implicitly reflects the extent of transaction costs. Levine and Zervos (1996) indicate that the turnover ratio measures the volume of stock transactions relative to market capitalization. This ratio measures the volume of stocks traded relative to market size. A high turnover rate is often used as an indicator of low transaction costs. It is important to note that a large stock market is not necessarily a liquid market: a large but inactive market will have a high market capitalization ratio but a low turnover ratio. Levine and Zervos (1996) demonstrate that a high turnover rate means the market is active and transaction costs are low. Datar et al. (1998) use the turnover ratio as a liquidity

indicator. They conclude that liquidity plays an important role in explaining differences in yield. They conclude that each 1% increase in the turnover rate reduces annual yields by approximately 0.54%.

Diamond and Verrecchia (1991) described an inverse relationship between financial disclosure and the cost of equity capital through the concept of stock liquidity. Low information asymmetry tends to strengthen the liquidity of securities. This helps reduce the cost of equity capital by reducing the transaction costs of traded securities. Darwish (2012) examines the effect of returns on transaction volume for the Palestinian financial market using weekly data. He shows that the relationship between return and transaction volume is positively correlated and there is a bidirectional causality between these two variables (returns and transaction volumes). Goldstein and Nelling (1999) demonstrate that high transaction volume leads to high liquidity levels.

Hypothesis 1.2: Turnover rate has a positive effect on the cost of equity capital.

According to the theoretical foundations of market microstructure theory, the bid-ask spread reflects the total cost associated with trading an asset. This includes costs arising from cost of information asymmetry, market making activities, order transmission, and position management (Peng et al., 2024). Easley and O'hara (1992) suggests that a significant volume of transactions is linked to a reduction in spreads, which reflects the presence of economies of scale in market making. Also, Market making theory indicates that the spread widens with the cost of holding the position. This cost stems from opportunity cost and the risk generated by holding a position. This unobservable variable can be estimated through its components, such as the cost associated with volatility risk (Zhu et al., 2025) and liquidity cost (Huang et al., 2025). The price spread can be considered as a signal of the expected volatility by agents placing limit orders. In this context, Huang et al. (2025) demonstrate that when the proportion of informed agents is reduced, anonymity leads to a reduction in the price spread. Therefore, the informed agent acts cautiously by presenting a wider spread. However, the uninformed agent, who cannot identify the leader, interprets this price spread as a weak signal of information risk because it could potentially come from a pre-committed intermediary.

Uninformed agents are more active, the informational content of the bid-ask spread is lower. The opposite consequences are observed when the quota of informed agents is high: anonymity increases the bid-ask spread and its informational content. Amihud and Mendelson (1986) assert that more transparent financial communication helps reduce information asymmetry and increase the liquidity of stocks issued by a company. Indeed, out of fear of trading with better-informed investors, uninformed investors defend themselves through bid-ask spreads. This condition leads to a wide bid-ask spread. In addition, agency costs reduce the volume of securities traded by uninformed

investors. Ultimately, these two combined effects reduce the liquidity of company securities in the markets and increase their cost of capital.

Ajina et al. (2015) investigated the impact of corporate disclosure on information asymmetry and stock market liquidity among French companies listed between 2004 and 2007. Their findings highlight the critical role of information contained in annual reports in shaping investor behavior. Specifically, they measured information asymmetry using the bid-ask spread and assessed liquidity through market indicators. The study revealed that the extent of corporate disclosure in annual reports positively influences market liquidity. Moreover, a negative relationship was observed between the level of disclosed information and the adverse selection component of the bid-ask spread, suggesting that greater transparency reduces information asymmetry and enhances trading efficiency.

Li and Tam (2011) argue that lower transaction costs facilitate quicker adjustments toward target capital structures following deviations, thereby diminishing the persistence of market timing effects. This dynamic contributes to enhanced market liquidity by increasing the volume of securities traded and reducing the overall cost of capital. In contrast, Brock and Kleidon (1992) predict that wider bid-ask spreads (indicative of lower liquidity) are paradoxically associated with higher transaction volumes. This suggests that while liquidity constraints may exist, trading activity can remain elevated due to other market forces, highlighting the complex relationship between transaction costs, liquidity, and market behavior. Therefore, we hypothesize the following:

H 1.3: The spread has a positive effect on the cost of equity capital.

Several studies have shown the importance of market capitalization as a key macro indicator for country analysis. It provides an indication of the impact of financial market development on economic growth (Kumar N., 2010). According to Robins et al. (2015), the effect of market capitalization can be interpreted as an investment strategy. A variety of researchers (Khediri & Daadaa, 2011; Masoub, 2013; Montes & Oliveira, 2025; Sethi et al., 2019) have used market size as an indicator of financial market development. For instance, Hina and Ajmal (2018) studied the relationship between capital structure and company performance before and during the financial crisis. The study focused on 49 construction companies listed on Bursa Malaysia from 2005 to 2008. They showed a relationship between capital structure and company performance.

More precisely, for large companies, there is a positive relationship between return on assets and debt to market capitalization. Phan and To (2025) demonstrate that market capitalization has a positive and statistically significant effect on capital market liquidity. Agarwal and Mohtadi (2004) suggest that stock market development (represented by the percentage of transaction value in market capitalization) generates financial resources to better support

companies. This means that companies can leverage equity further by issuing shares and increasing share liquidity.

H 1.4: Market capitalization has a positive effect on cost of equity capital.

The transaction value can be examined as a liquidity criterion as it allows measuring the speed at which a security can be traded on the financial market. Nowbutsing and Odit (2011) examined the impact of stock market development on growth in Mauritius. An econometric survey on time series is conducted for the period 1989-2006. They analyzed short and long-term relationships by constructing an Error Correction Model (ECM). Two measures of stock market development, namely size and liquidity, were considered. They found that the value of traded securities as a percentage of GDP has a positive impact on short and long-term economic growth. Demirguc-Kunt and Maksimovic. (1994) argue that the increase in volume and value of stock transactions can justify the ability to generate equity.

H 1.5: The value of transactions as a percentage of GDP has a positive effect on the cost of equity capital.

Several studies show that capital structure decisions are more sensitive to stock return volatility as default risk increases. Companies significantly opt for reducing their debt financing due to the high volatility of stock returns and to avoid the possible consequences of default. Darrat et al. (2003) investigate the relationship between trading volume and volatility. They show that the volume of traded securities increases in parallel with return volatility. In other words, an increase in trading volume is associated with an increase in return volatility, leading to an increase in capital costs. Given this, the literature has extensively attempted to understand the relationship between liquidity, volatility, and transaction activity in different markets. The inverse relationship is predicted between return volatility and liquidity in market microstructure theory based on the assumption that market makers bear significant inventory risk for holding a highly volatile security. Empirical studies confirm this relationship by showing a positive relationship between a security's return volatility and its illiquidity (Amihud & Mendelson, 1986; Cheriyan & Lazar, 2019; Diamond & Verrecchia, 1991; Loukil et al., 2010). This contradicts traditional market microstructure theory, where low return volatility is associated with higher trading volumes.

H 1.6: The volatility of returns has a positive effect on the cost of equity capital.

Financial leverage is a measure of the level of debt (Jaisinghani & Kanjilal, 2017). It is defined as the ratio of total debt to total assets. Debt provides tax savings opportunities because interest is deductible; however, higher leverage is also associated with higher risk (risk of bankruptcy) (Fama & French, 1993). In addition, Modigliani and Miller (1958) show that the cost of equity increases as financial leverage increases. Jaisinghani and Kanjilal (2017)

indicate that small businesses are negatively influenced by the presence of high levels of debt. Vithessonthi and Tongurai (2015) examined a sample of 159,375 non-financial companies in Thailand during the period 2007-2009. They find that leverage is negatively related to company performance. Khediri and Daadaa (2011) examined the effect of stock trading on capital structure of Tunisian companies listed on the stock exchange during the period 2000-2009. They find that leverage is negatively related to stock trading activity and profitability.

H 1.7: The financial leverage variable has a negative effect on the cost of equity capital.

According to the traditional market microstructure theory, a liquid market will have higher trading volume and therefore be less volatile. From this triangular relationship, a theoretically supported inverse relationship between liquidity and volatility can be revealed, indicating that greater volatility can lead to a decrease in the liquidity of a stock market and vice versa. By focusing on this relationship, the literature identifies a severe liquidity crisis associated with increased volatility that led to the global financial crisis during the period 2007-2009.

Similarly, Barclay and Warner (1993) reveal a direct relationship between liquidity and volatility. Indeed, higher volatility is associated with greater liquidity, where the majority of participants are not informed. Inconsistently, the literature also suggests that professionals' knowledge of the existence of informed traders can cause an inverse relationship between the two (Foster and Viswanathan, 1990). Thus, empirical analysis yields two different results such as a positive relationship between volatility and liquidity as indicated by (Cheriyana & Lazar, 2019). The inverse relationship is predicted between volatility and liquidity in market microstructure theory. Market makers bear a greater inventory risk to hold a highly volatile security. Empirical studies have confirmed the existence of a positive relationship between the volatility of a security's price and its illiquidity (Amihud & Mendelson, 1986). In the Tunisian financial market context, Chabeb and Boubaker (2021) show that short-term volatility only affects buyers in the Tunisian stock market, as limit orders are likely to be placed when volatility increases. They find a weakly significant positive correlation between volatility and selling depth.

H 1.8: Volatility has a positive effect on the cost of equity capital in the Tunisian financial market.

In this study, we added three control variables (dividend policy, size, and inflation rate) to analyze the effects of other variables on the cost of capital. Multiple studies have indicated that dividend policy is important informational content. It provides a good or bad signal to market participants. In this context, Ntui et al. (2015) found a positive relationship between dividend yield and stock price. Distributing dividends can increase stock prices and reduce the cost

of capital. It can also be adopted by shareholders to adjust the risk-sharing between themselves and creditors. In cases where the level of debt is lower than it was at the time of issuing the bonds, shareholders may pay themselves a dividend to restore the situation. If they do not, creditors will receive too high a return given the additional risk.

Many empirical studies show that small companies are associated with higher risk, therefore have a higher cost of capital. In other words, a negative relationship occurs between size and stock returns as size decreases, returns tend to increase, and vice versa. Banz. (1981) analyzed the size effect in stock returns. He noticed that small companies had a higher average return than large companies. This indicates that the higher the risk, the higher the return. Consequently, investors demand higher returns to compensate for a high level of risk. Several studies have highlighted the importance of the inflation rate, especially in the context of countries facing economic difficulties (Elkhaldi & Daadaa, 2015). Empirically, Boyd et al. (2001) studied the relationship between inflation and the stock market evolution (represented by the market capitalization ratio, transaction value ratio, turnover ratio, and return volatility). They indicate that an increase in inflation rates reduces the real rate of return of currency and all other assets. Therefore, this reduces the incentive for agents to lend and increases their incentive to borrow. As a result, a higher inflation rate reduces the availability of credit. De Jong and Van Dijk (2007) emphasize that macroeconomic factors have a significant impact on companies' capital structure decisions. When the stock market expands, the equity ratio would be higher in the capital structure. Elkhaldi and Daadaa (2015) analyzed the macroeconomic determinants of the capital structure of Tunisian companies listed on the stock exchange over the period 2002-2012. The authors show that macroeconomic variables related to monetary and fiscal policy have an impact on leverage. They find a negative correlation between macroeconomic determinants (interest rate, unemployment rate, and inflation rate) and financial leverage.

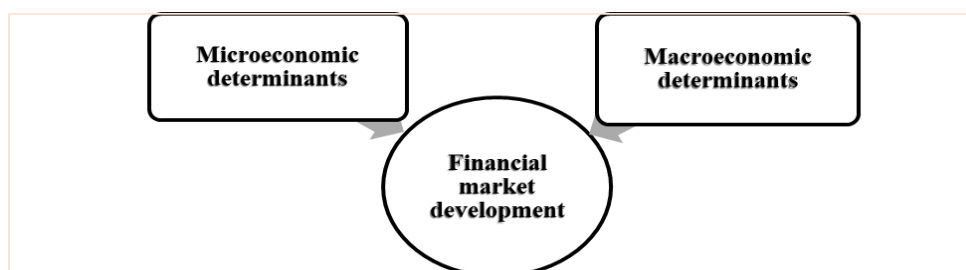
2. Research methods

2.1. Data

In order to test our hypotheses in the Tunisian context, we built a sample of 24 listed Tunisian companies. The sample is limited due to the exclusion of financial companies because of the specificity of their financial data. Additionally, we eliminated companies with missing data. Our work is based on observations from 2007 to 2016. The data is calculated manually from publications available at the Financial Market Council, from certain brokers, or on the websites of some firms, as well as from the publications of the Tunis Stock Exchange. The use of panel data offers the advantage of benefiting from both the individual and temporal dimensions of the available information.

To study the effect of the development of the financial market on the cost of equity capital of Tunisian companies listed on the Tunis Stock Exchange (BVMT), we conducted a multiple linear regression analysis on panel data. Therefore, our methodology is based on a regression analysis on panel data for a sample of 24 Tunisian companies listed on the BVMT over 10 years (2007-2016). Panel data allows to consider two dimensions at the same time: an individual dimension designated by the index "i" representing the firm, and a temporal dimension indicated by the index "t", representing time. It is therefore a form of multiple regression that allows to address both individual and temporal effects simultaneously. On the contrary, this is impossible with time series or cross-sectional data. The estimation of the cost of equity capital variable is determined by the ex-post method through the Capital Asset Pricing Model (CAPM). Data collection is daily from 01/01/2005 to 12/31/2016.

Figure 1: Determinants of the development of the Tunisian financial market



Source: Author

Table 1: Summary table of measures of financial market development and cost of equity capital

Variable	Notation	Mesure	Signe attendu
dependant variable			
Cost of equity capital	COE	$Re = rf + \beta(rm - rf)$	
Les variables indépendantes			
Return	REND	Measured by the ratio of prices at T and T-1 increased by the dividend	(+)
Turnover Rate	TURNOVER	Trading volume as a percentage of market capitalization.	(+)
Spread	Spread	The ratio between the fork and the middle of the fork	(+)
Market Cap to GDP Ratio	CPIB	Market capitalization expressed in GDP.	(-)
Transaction Value to GDP	VPIB	Value of transactions as a percentage of gross domestic product.	(+)
		Is a control for a firm's risk is calculated as the standard deviation of monthly stock returns over	

Return Volatility	Rvar	the past 12 months.	(+)
Leverage	Lev	Total liabilities as a percentage of equity	(-)
Historical Volatility	Vol	Historical volatility based on the historical variations that a security's price has experienced.	(+)
Control variables			
Dividend Policy	DIVI	Dummy variable equal to 1 if firm i distributed dividends in year t, otherwise 0.	(+)
Size	Taille	Logarithm of total assets	(-)
Inflation	INF	Log of inflation rate	(-)

2.2. Statistical development of the conceptual model

The cost of equity capital can depend on several factors, such as: Return, turnover rate, price range, stock market capitalization as a percentage of GDP, transaction value as a percentage of GDP, return volatility, financial leverage, volatility, dividend policy, size, inflation. This is a multiple linear regression that takes the form:

$$COE_{i,t} = \beta_0 + \beta_1 Rend_{i,t} + \beta_2 ROTATION_{i,t} + \beta_3 Spread_{i,t} + \beta_4 CPIB_{i,t} + \beta_5 VPIB_{i,t} + \beta_6 Rvar_{i,t} + \beta_7 LEV_{i,t} + \beta_8 Vol_{i,t} + \beta_9 DIVI_{i,t} + \beta_{10} Taille_{i,t} + \beta_{11} INF_{i,t} + \varepsilon_{i,t} (1)$$

Analysis and Discussion

2.1. Bivariate analysis

Table 2: Descriptive statistics

	Kcp	REND	TURNOVER	Spread	CPIB	VPIB	Rvar	DIVI	Lev	Taille	INF	Vol
Mean	0.0003	0.080	0.061	0.060	0.0105	0.913	0.102	0.704	1.711	7.896	0.041	0.036
Median	0.0003	-0.0002	0.019	0.015	0.1245	0.875	0.082	1.000	0.980	7.848	0.040	0.010
Maximum	0.002	3.947	0.794	1.213	1.7068	2.450	0.689	1.000	36.075	9.374	0.063	0.884
Minimum	-0.011	-0.652	1.20E-05	-0.741	-2.694	-0.801	0.026	0.000	-26.804	6.386	0.020	0.001
Standard Deviation	0.0009	0.435	0.104	0.163	0.798	0.551	0.084	0.457	4.021	0.4191	0.011	0.089

Table 2 represents the descriptive statistics of the independent variable and the dependent variables that will be introduced in our model. We find that listed Tunisian companies have an average cost of equity capital equal to 0.03%. The maximum cost of equity capital is around 0.2% and the minimum cost of equity capital is equal to -1.1%, indicating a significant divergence among the listed Tunisian companies in our sample.

Table 3: Correlation matrix of measures of financial market development

	REND	TURNOVER	Spread	CPIB	VPIB	Rvar	DIVI	LEV	Size	INF	Vol
REND	1										
TURNOVER	0.052	1									
Spread	0.135	-0.128	1								
CPIB	0.208	0.290	0.072	1							
VPIB	0.160	-0.259	0.175	0.531	1						
Rvar	0.144	-0.002	0.174	-0.003	-0.002	1					
DIVI	0.039	-0.036	0.129	0.240	0.162	-0.153	1				
LEV	0.098	-0.039	-0.040	0.002	0.002	0.021	-0.233	1			
Size	-0.060	-0.083	0.015	0.191	0.493	-0.036	-0.217	0.452	1		
INF	-0.013	0.043	-0.021	-0.054	-0.064	-0.025	0.0166	0.036	0.022	1	
Vol	0.141	0.016	0.028	-0.063	-0.096	0.484	-0.150	0.006	-0.125	0.067	1

Table 3 presents the Pearson correlation matrix between the different variables selected in our model. Volatility has a strong positive correlation (0.48) with return volatility. However, it has a negative correlation with market capitalization as a percentage of GDP, value of transactions as a percentage of GDP, size, and dividend policy. Turnover variable has a positive correlation with return, value of transactions as a percentage of GDP, inflation, and volatility. It has a negative correlation of -0.128 with price range, transaction volume as a percentage of GDP, return volatility, dividend policy, leverage, and size are equal to -0.083. The dividend policy variable has a positive correlation with return, price range, market capitalization as a percentage of GDP, and size. However, it has a negative correlation of -0.036 with TURNOVER, -0.153 with return volatility.

Table 4: multicollinearity test on the variable characteristics in the VIFs calculation

Variable	VIF	1/VIF
CPIB	2.95	0.338
Taille	2.55	0.391
VPIB	2.07	0.483
LEV	1.69	0.590
ROTATION	1.55	0.644
Rvar	1.39	0.721
Vol	1.38	0.725
DIVI	1.29	0.777
REND	1.14	0.873
FOURCHETTE	1.11	0.899
INF	1.03	0.968
Mean VIF	1.65	

Source: author

Subsequent the realization of various tests to determine the most appropriate estimation method for the equation, it was observed that there is no significant multicollinearity between the variables. Additionally, the assumption of normality of the residuals was validated, but individual heteroscedasticity is present. In other words, no VIF greater than or equal to 10 was detected (the highest being 2.95). However, the average of the VIFs is slightly below 2 (1.65). Therefore, the threshold of 10 was retained, indicating the absence of significant multicollinearity for our variables. Furthermore, the probability of the Jarque-Bera statistic exceeds the 5% threshold, confirming the presence of

individual heteroscedasticity according to the White test. Finally, the Hausman test showed that the coefficients of the two estimations (fixed and random) are not statistically different, leading to the preference for adopting a random effects model. Therefore, the model was estimated using the generalized least squares method.

Analysis and Discussion

Table 5: Impact of the development of the financial market on the cost of equity capital of Tunisian listed firms

Variable	Coefficient	t-Statistic	Prob.
Constant	0.0004	0.776	0.438
REND	0.0002	2.729	(0.006) ***
TURNOVER	0.0005	1.894	(0.061) *
Spread	0.0003	1.714	(0.098) *
CPIB	4.18E-05	0.500	(0.124)
VPIB	-9.16E-05	-1.827	(0.068)
Rvar	-0.0006	-1.648	(0.1006)
Vol	0.0009	3.284	(0.001) ***
LEV	-1.51E-05	-2.595	(0.010) **
DIVI	-0.00015	-2.553	(0.011) **
Taille	4.21E-05	0.547	(0.584)
INF	-0.006	-3.051	(0.002) ***
R-squared	0.189		
F-statistic	4.842		
Prob(F-statistic)	0.000		
Durbin-Watson stat	1.671		

Notes : This table presents the effect of the development of the financial market on the cost of equity capital of the 24 non-financial companies listed on the BVMT observed over the period from 2007 to 2016. The dependent variable is the cost of equity capital (COE). The independent variables are: return (REND); turnover rate (TURNOVER); Spread; market capitalization as a percentage of GDP (CPIB); trading volume as a percentage of GDP (VPIB); return volatility (Rvar); dividend policy (DIVI). In all regressions, we control for a number of variables specific to financial performance and risk, including company size, inflation, and volatility. The estimation method used is the generalized least squares estimated (MCG estimated). ***, **, and * respectively represent statistical significance levels at 1%, 5%, and 10%. Values in parentheses are p-values.

Table 5 presents the relationship between the cost of equity capital and various determinants of stock market development. The Durbin-Watson statistic, calculated at 1.671, supports the acceptance of the null hypothesis, indicating the absence of autocorrelation in model's residuals of errors. Furthermore, the p-value associated with the Fisher statistic is effectively zero (0.000), confirming that the overall model is statistically significant.

The empirical analysis demonstrates that the return level exerts a statistically significant and positive effect on the cost of equity capital for Tunisian firms listed on the stock exchange, with significance at the 1% level. Specifically, a one-percentage-point increase in firm performance is associated with an average rise of 0.06 percentage points in the cost of equity capital. This result aligns with the theoretical expectation that enhanced performance boosts investor confidence, thereby reducing perceived risk and lowering the required rate of return. In financial markets, investors typically demand compensation for risk through higher returns; thus, superior performance serves as a signal of reduced risk, contributing to a more favorable cost of capital structure. Furthermore, market liquidity emerges as a pivotal factor in this dynamic. Increased liquidity tends to elevate stock valuations, which in turn compresses the cost of capital. The foundational work of Diamond and Verrecchia (1991) supports this relationship, arguing that improved corporate disclosure reduces information asymmetry, thereby enhancing market liquidity and stimulating investor demand. Their model suggests that firms engaging in transparent reporting practices can attract a broader investor base, leading to higher asset prices and a lower cost of equity.

We also find that the turnover rate is positively and statistically significantly associated with the cost of equity capital, with significance at the 10% level. This suggests that turnover rate serves as a critical indicator of market liquidity, which in turn influences investor behavior and financing costs. Empirically, a one-percentage-point increase in turnover rate corresponds to a 0.6% rise in the cost of equity capital, indicating that higher trading activity may be linked to increased transaction costs and perceived risk. This positive relationship aligns with theoretical expectations, where elevated turnover reflects greater liquidity but also potentially higher volatility and trading costs. As a result, investors may demand a higher risk premium, thereby increasing the cost of equity. This result aligns with the work of Datar, Naik, and Radcliffe (1998). They found that the turnover rate plays a significant role in explaining cross-sectional variations in stock returns. Their study concluded that each 1% increase in turnover is associated with a reduction in annual returns by approximately 0.54%, which indirectly contributes to a higher cost of equity. These findings underscore the importance of liquidity metrics in financial market analysis and suggest that firms operating in less liquid environments may face higher equity financing costs due to increased investor risk aversion.

The bid-ask spread, widely recognized as an inverse proxy for market liquidity, exhibits a positive and statistically significant impact on the cost of equity capital at the 10% significance level. Empirical evidence suggests that a 10% increase in the spread corresponds to a 0.98% rise in the cost of equity capital. This relationship is consistent with microstructure theory, which posits that the bid-ask spread reflects the cumulative costs of trading, including those arising from information asymmetry, inventory holding, and order processing. A wider spread signals greater uncertainty and higher transaction costs, prompting investors to demand a higher risk premium, thereby increasing the cost of equity financing. This finding is supported by studies in financial economics. For instance, Demsetz (1968) introduced the concept of transaction costs as the “cost of exchanging ownership titles,” emphasizing the role of the bid-ask spread in capturing market inefficiencies. Biais (1993) extended this framework by analyzing how market structure influences price formation and liquidity, showing that fragmented markets tend to exhibit more volatile spreads, which can elevate financing costs. Moreover, holding securities entails opportunity costs, particularly when spreads are wide. Investors facing higher spreads may require greater compensation for illiquidity and uncertainty, which translates into a higher cost of equity capital for firms. These findings underscore the importance of market microstructure in understanding the dynamics of equity financing and investor behavior.

The variable representing stock market capitalization as a percentage of GDP (CPIB) shows a positive coefficient, although it is statistically insignificant. Despite the lack of significance, the direction of the relationship suggests that higher market capitalization may contribute to improved liquidity and reduced transaction costs, thereby lowering the cost of equity capital. This finding is consistent with the theoretical and empirical literature on financial development. For instance, Levine (1996) provides robust evidence that stock market development is positively associated with long-run economic growth, emphasizing the role of liquid and efficient markets in facilitating capital accumulation and productivity gains. Moreover, Mureșan and Silaghi (2013) demonstrate that market capitalization significantly influences liquidity in European Union capital markets, suggesting that larger and more developed markets tend to exhibit greater trading activity and efficiency.

As market capitalization reflects the aggregate value of listed firms—essentially the present value of expected future dividends—its expansion is generally associated with enhanced investor confidence, improved price discovery, and reduced financing costs. Although the statistical insignificance in the current model may reflect country-specific factors or data limitations, the theoretical foundation and cross-country evidence underscore the potential relevance of market capitalization in shaping equity financing conditions.

The variable *Rvar*, which captures the volatility of returns, displays a negative but statistically insignificant coefficient. This suggests that lower return volatility may be associated with higher trading volumes, potentially leading to a reduced risk premium demanded by investors and, consequently, a lower cost of equity capital. However, this interpretation is not statistically robust and contradicts findings in the existing literature. For instance, Darrat et al. (2003) and Huang and Masulis (2003) report a positive relationship between return volatility and trading volume, indicating that increased volatility tends to stimulate trading activity rather than suppress it. In contrast, the variable *Vol*, representing the volatility of financial asset prices, exhibits a positive and statistically significant effect on the cost of equity capital at the 1% level. This result implies that heightened market volatility increases the cost of equity for Tunisian firms, as investors demand higher returns to compensate for elevated levels of risk and uncertainty. This finding is consistent with the theoretical and empirical work of Sbeai et al. (2014), Nikoomaram et al. (2011), Amihud and Mendelson (1989), Foster and Viswanathan (1990), and Stoll (2000). These studies collectively argue that price volatility amplifies perceived risk, prompting investors to require a higher risk premium. Moreover, empirical evidence has shown a positive association between asset price volatility and liquidity costs, reinforcing the notion that volatile markets impose additional financing burdens on firms. In the context of the Tunisian financial market, Hmaied et al. (2004) identified a weak but positive correlation between volatility and market depth, suggesting that investors operating in uncertain environments demand substantial compensation to mobilize their capital. Overall, the observed relationship between price volatility and the cost of equity capital aligns with theoretical expectations and underscores the importance of market stability in reducing financing costs.

Leverage demonstrates a negative and statistically significant relationship at the 5% level, indicating that higher debt levels relative to equity are associated with increased financing costs. This suggests that firms with greater market liquidity tend to favor equity financing over debt, a finding consistent with prior research by Lipson and Mortal (2009), Vithessonthi and Tongurai (2015), and Khediri and Daadaa (2011). The analysis of control variables reveals several notable effects on the cost of equity capital.

Among the control variables, dividend policy exhibits a negative and statistically significant effect at the 5% level. A reduction in dividend payouts may send adverse signals to investors, potentially leading to lower stock valuations and a higher cost of equity capital. This outcome is consistent with signaling theory, which highlights the role of dividends in conveying information about a firm's future profitability and financial stability. However, this result contrasts with earlier studies such as Brennan (1971) and Shobhana & Karpagavalli (2011), who reported a positive relationship between dividend

yield and stock prices, suggesting that dividends can enhance investor confidence and firm valuation. The variable representing firm size, measured by the logarithm of total assets, shows a positive but statistically insignificant coefficient. Although larger firms are generally expected to benefit from lower capital costs due to economies of scale, better access to financial markets, and reduced agency problems, this relationship is not confirmed in the Tunisian context. This finding diverges from the results of Kim et al. (2015) and Jaisinghani & Kanjilal (2017), who observed a negative correlation between firm size and the cost of equity capital in other markets. Finally, inflation demonstrates a negative and highly significant effect at the 1% level. Elevated inflation rates are associated with increased equity financing costs, reflecting the adverse impact of macroeconomic instability on investor sentiment and market conditions. This result is supported by studies such as De Jong et al. (2007), Mills (1994), and Elkhaldi and Daadaa (2015), which emphasize the influence of inflation on corporate financial decisions and investor behavior.

Robustness test

We are moving on to the robustness test (Appendix 1 and 2) in order to better study the effect of financial market development determinants on the cost of capital. We observe that the turnover rate, price range, and volatility have a positive and statistically significant effect at the 5% and 1% threshold. However, the value of securities traded as a percentage of GDP, financial leverage, dividend policy, and inflation have a negative and statistically significant effect at the 10% threshold. Our result confirms the importance of macroeconomic and activity factors in stimulating the growth of the stock market Chen (2018), Maverick (2019).

Conclusion

This paper explores the impact of financial market development on the cost of equity capital for Tunisian firms listed on the Tunis Stock Exchange (BVMT). We applied a panel data from a sample of 24 listed companies observed over the period from 2007 to 2016. Our research falls within the field of financial market microstructure, which seeks to document the evolution of various measures of financial market development. It also enables the study of the impact of factors that may explain these measures, particularly identifying the elements driving the development of the financial market for securities listed on the Tunisian stock exchange.

First, on a theoretical level, we attempted to find an appropriate measure of financial market development and to present a literature review of the financial structure of cost of capital. We found a lack of agreed-upon mechanisms for measuring financial market development. However, there are determining factors of financial market development. The literature on microstructure shows that trading volume, transaction value, and returns can

support these shortcomings. Indeed, this literature explains the trajectory of financial market development. The final stage of our theoretical study focused on studying the microstructure of the financial market and liquidity as well as market anomalies (notably the studies conducted by Amihud, Mendelson, and Wood (1990)). These studies show that financial crises have impacted the price spread mechanism and liquidity provision in the market. Indeed, financial crises have had a systematic and dramatic effect on the liquidity of global financial markets.

Literature supports the positive impact of stock market development on economic growth, as well as a reverse causality from the latter to the former. Therefore, researching appropriate measures for determining factors in stock market development is an important step for creating and implementing adequate financing and investment policies. We have followed the Capital Asset Pricing Model (CAPM) to measure the cost of equity capital for listed Tunisian companies. As such, we used daily data including portfolio and market returns, in addition to the risk-free interest rate of securities listed on the Tunisian stock market from 2005 to 2016, to calculate the cost of equity capital. This likely validates these measures in the Tunisian stock market. Finally, we used data including closing prices, trading volume, number of transactions, prices and quantities offered and demanded. We presented a liquidity market model for most securities listed on the Tunisian stock market.

We noticed that the Tunisian financial market has experienced multiple reforms marked by the following criteria: innovation, security, transparency, the need for quality information disclosure, and liquidity which constitutes a criterion for adjudicating the stock market. These changes have brought the Tunisian financial market in line with international standards. Furthermore, the adaptation and integration of new technologies into the functioning and organization of the Tunisian stock market allows for an increase in transaction volume and the introduction of new investors to the stock market. This helps to reduce transaction costs and ensure the quick execution of such transactions, as well as encourage foreign investors. We observe that the development of the stock market reduces the cost of equity capital. This supports the argument that the financial market plays a significant role in providing liquidity, reducing information asymmetry, diversifying risks, improving corporate governance, and reducing systematic macroeconomic uncertainty.

Furthermore, we found that the turnover rate, return on investment, price range, transaction value as a percentage of GDP, volatility, financial leverage, dividend policy, and inflation are significantly correlated with the cost of equity capital. In addition, the study of the simultaneous effect of these variables indicates that the development of the financial market in the industrial and commercial sector appears as a specific element for each security belonging to the same sector. Past information can also be considered as a specific element

for the different determinants of the development of the financial market of securities listed on the Tunisian stock market. One way to refine our results is to conduct a more comprehensive study on the understanding of the inter-temporal variation in the development of the stock market, taking into account all securities listed on the Tunisian stock market over a longer period of study. Indeed, this would allow us to draw more relevant conclusions and better generalize our results. Similarly, the results highlighted in the Tunisian stock market open up multiple paths for future research, such as considering economic and financial crises, political crises, etc.

Appendix :

Appendix 1 : Selected sample of Tunisian listed companies for the period 2007 to 2016 (0: industrial company, 1: commercial or service company).

Code	Sector	Abbreviation	Name
1	1	Magasin générale	Magasin générale
2	1	Monoprix	Monoprix
3	0	Siphat	Société des Industries Pharmaceutiques de Tunisie
4	0	ASSAD	ASSAD
5	1	Electrostar	Electrostar
6	0	GIF	GIF FILTER
7	1	STEQ	Société Tunisienne d'Equipement
8	0	STIP	Société Tunisienne des Industries de Pneumatique
9	0	SOTRAPIL	Société de transport des hydrocarbures par pipelines
10	1	SOMOCER	SOMOCER
11	1	SIAME	Société Industrielle d'Appareillage et de Matériels Electriques
12	0	ICF	Industries Chimiques du Fluor
13	1	AIRLIQUIDE	AIR LIQUIDE
14	0	ALIKIMIA	ALIKIMIA
15	1	SOTETL	Société Tunisienne d'Entreprise et Télécommunication
16	1	SOTUMAG	Société Tunisienne des Marchés de Gros
17	0	SOTUVER	Société Tunisienne de Verreries
18	1	TUNISAIR	Société tunisienne d'Air
19	0	SFBT	Société de Fabrication des Boissons de la Tunisie
20	1	SIMPAR	Société Immobilière et de Participations
21	1	SITS	Société Immobilière Tunisio-Saoudienne
22	1	ESSOUKNA	ESSOUKNA
23	1	ADWYA	ADWYA
24	0	TPR	Tunisie Profilés Aluminium

Appendix 2: Chow Test before revolution period

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.239076	(23,63)	0.2477
Cross-section Chi-square	35.826286	23	0.0430

Cross-section fixed effects test equation:

Dependent Variable: COE

Method: Panel Least Squares

Date: 11/10/21 Time: 16:28

Sample: 2007 2010

Periods included: 4

Cross-sections included: 24

Total panel (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RVAR	-0.000232	0.000376	-0.618172	0.5381
DIVI	1.03E-05	9.69E-05	0.105910	0.9159
LEV	-3.37E-05	1.55E-05	-2.169960	0.0328
size	9.54E-05	4.65E-05	2.053529	0.0431
INF	-0.012403	0.002442	-5.079428	0.0000
Turnover	8.06E-05	0.000145	0.554584	0.5806
LOGPIB	0.004049	0.001053	3.843600	0.0002
GROWTH	4.81E-05	1.77E-05	2.722861	0.0078
POLRISK	-0.000111	9.56E-05	-1.160920	0.2489
C	-0.028106	0.007034	-3.995627	0.0001
R-squared	0.397488	Mean dependent var		0.000510
Adjusted R-squared	0.334435	S.D. dependent var		0.000438
S.E. of regression	0.000357	Akaike info criterion		-12.93925
Sum squared resid	1.10E-05	Schwarz criterion		-12.67213
Log likelihood	631.0838	Hannan-Quinn criter.		-12.83127
F-statistic	6.303980	Durbin-Watson stat		2.495588
Prob(F-statistic)	0.000001			

Appendix 3 : Chow Test after revolution period

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.609594	(23,63)	0.0704
Cross-section Chi-square	44.375233	23	0.0047

Cross-section fixed effects test equation:

Dependent Variable: KCP

Method: Panel Least Squares

Date: 11/10/21 Time: 16:19

Sample: 2011 2014

Periods included: 4

Cross-sections included: 24

Total panel (balanced) observations: 96

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.017124	0.007901	-2.167158	0.0330
RVAR	-0.000460	0.000674	-0.682428	0.4968
DIVI	-0.000119	0.000111	-1.075848	0.2850
LEV	2.64E-06	1.71E-05	0.154441	0.8776
size	-5.26E-05	5.44E-05	-0.965909	0.3368
INF	0.008058	0.010552	0.763669	0.4472
Turnover	-3.68E-05	2.72E-05	-1.354162	0.1792
LOGPIB	0.002637	0.001160	2.272108	0.0256
GROWTH	-1.44E-05	1.89E-05	-0.760376	0.4491
POLRISK	3.99E-05	0.000116	0.342949	0.7325
R-squared	0.108682	Mean dependent var		0.000189
Adjusted R-squared	0.015404	S.D. dependent var		0.000406
S.E. of regression	0.000402	Akaike info criterion		-12.69951
Sum squared resid	1.39E-05	Schwarz criterion		-12.43239
Log likelihood	619.5764	Hannan-Quinn criter.		-12.59153
F-statistic	1.165146	Durbin-Watson stat		1.936101
Prob(F-statistic)	0.327574			

References :

Abaidoo, R., & Agyapong, E. K. (2024). Financial market uncertainty and the macro economy: the role of governance and institutional quality. *Economia*, 26(1), 89-107. <https://doi.org/10.1108/econ-02-2023-0034>

Agarwal, S., & Mohtadi, H. (2004). Financial markets and the financing choice of firms: Evidence from developing countries. *Global Finance Journal*, 15(1), 57-70. <https://doi.org/10.1016/j.gfj.2003.10.004>

Ajina, A., Lakhal, F., & Sougné, D. (2015). Institutional investors, information asymmetry and stock market liquidity in France. *International Journal of Managerial Finance*, Emerald Group Publishing Limited, 11(1), 44-59.

Amihud, Y., & Mendelson, H. (1986). Asset pricing and the bid-ask spread. *Journal of Financial Economics*, 17(2), 0–249.

Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9(1), 0–18. [https://doi.org/10.1016/0304-405x\(81\)90018-0](https://doi.org/10.1016/0304-405x(81)90018-0)

Barclay, M. J., & Warner, J. B. (1993). Stealth trading and volatility: Which trades move prices? *Journal of Financial Economics* 34(3), 281–305. [https://doi.org/10.1016/0304-405x\(93\)90029-b](https://doi.org/10.1016/0304-405x(93)90029-b)

Barry, C. B., & Brown, S. J. (1984). Differential Information and the Small Firm Effect. *Journal of Financial Economics*, 13, 283-294. <https://doi.org/10.2307/2330758>

Brav, A. (2003). Market Indeterminacy. Available at SSRN: <https://ssrn.com/abstract=425620>.

Chabeb, W., & Boubaker, A. (2021). Liquidity of Tunisian Stock Market: A Panel Var Estimation. *Accounting and Finance Research*, 10(3). <https://doi.org/10.5430/afr.v10n3p93>

Cheriyana, N. K., & Lazar, D. (2019). Relationship between Liquidity, Volatility and Trading Activity: An Intraday Analysis of Indian Stock Market. *International Journal of Economics and Financial Issues*, 9(1). <https://doi.org/10.32479/ijefi.7268>

Chowdhury, R. H., & Maung, M. (2012). Financial market development and the effectiveness of R&D investment: Evidence from developed and emerging countries. *Research in International Business and Finance*, 26(2), 258-272. <https://doi.org/10.1016/j.ribaf.2011.12.003>

Colombo, M. G., & Grilli, L. (2005). Start-up size: The role of external financing. *Economics Letters*, 88(2), 243-250. <https://doi.org/10.1016/j.econlet.2005.02.018>

Darwish, M. (2012). Testing the Contemporaneous and Causal Relationship between Trading Volume and Return in the Palestine Exchange. *International Journal of Economics and Finance*, 4(4). <https://doi.org/10.5539/ijef.v4n4p182>

Datar, V. T., Y., Naik, N., & Radcliffe, R. (1998). Liquidity and stock returns: An alternative test. *Journal of Financial Markets*, 1(2), 203-219.

De Jong, A., & Van Dijk, R. (2007). Determinants of Leverage and Agency Problems: A Regression Approach with Survey Data. *The European Journal of Finance*, 13(6), 565-593.
<https://doi.org/10.1080/13518470701198734>

Demirguc-Kunt, A., & Maksimovic, V. (1994). Capital structures in developing countries. *World Bank Policy Research Paper No 1320*.

Diamond, D., & Verrecchia, R. (1991). Disclosure, Liquidity, and the Cost of Capital. *Journal of Finance*, 46, 1325-1360.
<https://doi.org/10.1111/j.1540-6261.1991.tb04620.x>

Diantimala, Y., Syahnur, S., & Islahuddin, I. (2022). Recursive correlation between voluntary disclosure, cost of capital, information asymmetry, and firm value. *Cogent Business & Management*, 9(1).
<https://doi.org/10.1080/23311975.2022.2154489>

Easley, D., & O'hara, M. (1992). Time and the Process of Security Price Adjustment. *The Journal of Finance*, 47(2), 577-605.
[doi:10.1111/j.1540-6261.1992.tb04402.x](https://doi.org/10.1111/j.1540-6261.1992.tb04402.x)

Elkhaldi, A., & Daadaa, W. (2015). Economic Determinants of Corporate Capital Structure: The Case of Tunisian Firms. *International Journal of Economics and Finance*, 7(9). <https://doi.org/10.5539/ijef.v7n9p193>

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33(1), 3-56.
[https://doi.org/10.1016/0304-405x\(93\)90023-5](https://doi.org/10.1016/0304-405x(93)90023-5)

Goldstein, M. A., & Nelling, E. F. (1999). Market Making and Trading in Nasdaq Stocks. *The Financial Review*, 34(1), 27-44.
<https://doi.org/10.1111/j.1540-6288.1999.tb00443.x>

Hail, L., & Leuz, C. (2006). International Differences in the Cost of Equity Capital: Do Legal Institutions and Securities Regulation Matter? *Journal of Accounting Research*, 44(3), 485-531.
<https://doi.org/10.1111/j.1475-679X.2006.00209.x>

Herwany, A., Omar, M. A., Meera, A. K., & Febrian, E. (2014). Asset Pricing and Volatility Modeling: The Case of Indonesia Stock Market. *Available at SSRN 2616172*.

Hina, K. b., & Ajmal, M. (2018). The Result Shows That There Is Relationship between Capital Structures. *American Research Journal of Humanities Social Science*, 1(1), 01-06.

Huang, W., Rinaldo, A., Schrimpf, A., & Somogyi, F. (2025). Constrained liquidity provision in currency markets. *Journal of Financial Economics*, 167. <https://doi.org/10.1016/j.jfineco.2025.104028>

Jaisinghani, D., & Kanjilal, K. (2017). Non-linear dynamics of size, capital structure and profitability: Empirical evidence from Indian

manufacturing sector. *Asia Pacific Management Review*, 22(3), 159-165. <https://doi.org/10.1016/j.apmr.2016.12.003>

Jeribi, A., Fakhfekh, M., & Jarboui, A. (2015). Tunisian revolution and stock market volatility: evidence from FIEGARCH model. *Managerial Finance*, 41(10), 1112-1135. <https://doi.org/10.1108/mf-12-2014-0310>

Jonathan, W., & Lorie, Z. (2007). Estimating and Comparing the Implied Cost of Equity for Canadian and U.S. Firms. *Staff Working Papers 07-48, Bank of Canada*.

Khediri, K. B., & Daadaa, W. (2011). Stock trading and capital structure in Tunisian stock exchange. *Journal of Business Studies Quarterly*, 3 (2), 10-24.

Levine, R., & Zervos, S. (1996). Stock markets, banks, and economic growth. *Policy Research Working Paper Series 1690, The World Bank*. <https://doi.org/10.4172/2167-0234.1000365>

Loukil, N., Zayani, M. B., & Omri, A. (2010). Impact of liquidity on stock returns: an empirical investigation of the Tunisian stock market. *Macroeconomics and Finance in Emerging Market Economies*, 3(2), 261-283. <https://doi.org/10.1080/17520843.2010.498137>

Mansali, H., & Daadaa, W. (2018). Equities issues and long-term firm's performances in Tunisian stock market. *International Journal of Managerial and Financial Accounting*, 10(1). <https://doi.org/10.1504/ijmfa.2018.091074>

Masoub, N. (2013). Stock Markets. *International Journal of Finance & Banking Studies* (2147-4486), 2(4), 13-29. <https://doi.org/10.20525/ijfbs.v2i4.160>

Masoud, N., & Hardaker, G. (2012). The impact of financial development on economic growth. *Studies in Economics and Finance*, 29(3), 148-173. <https://doi.org/10.1108/10867371211246830>

Meskini, Z., & Chaibi, H. (2024). The ripple effect: analyzing the contagion of the Tunisian revolution on the Egyptian stock market. *Journal of Financial Regulation and Compliance*, 32(5), 555-571. <https://doi.org/10.1108/jfrc-09-2023-0153>

Missaoui, I., & Alduraywish, Y. (2023). Capital Structure and Macroeconomic Determinants in Emerging Country: A Panel Quantile Regression Approach. *International Journal of Economics and Finance*, 15(12). <https://doi.org/10.5539/ijef.v15n12p68>

Missaoui, I., & Brahmi, M. (2025). Decision to Determine the Optimal Firm's Capital Structure. In *Converging Economic Policy, Corporate Strategy, and Technology for Emerging Economies* (pp. 39-58). <https://doi.org/10.4018/979-8-3693-5723-1.ch002>

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, 48(3), 261-297.

Montes, G. C., & Oliveira, V. (2025). Effects of Financial Development on Investments: New Evidence Considering Different Aspects of Financial Development. *International Journal of Finance & Economics*. <https://doi.org/10.1002/ijfe.3175>

Nadarajah, S., Ali, S., Liu, B., & Huang, A. (2018). Stock liquidity, corporate governance and leverage: New panel evidence. *Pacific-Basin Finance Journal*, 50, 216-234. <https://doi.org/10.1016/j.pacfin.2016.11.004>

Nowbutsing, B. M., & Odit, M. P. (2011). Stock Market Development And Economic Growth: The Case Of Mauritius. *International Business & Economics Research Journal (IBER)*, 8(2). <https://doi.org/10.19030/iber.v8i2.3104>

Ntui, P. P., Yuda, T. Y., Prosper, K., & Samwel, G. (2015). Relationship between Dividend Policy and Share Price. *Archives of Business Research*, 3(3). <https://doi.org/10.14738/abr.33.1118>

Peng, Z., Xiong, K., & Yang, Y. (2024). Microstructure of the Chinese stock market: A historical review. *Pacific-Basin Finance Journal*, 88. <https://doi.org/10.1016/j.pacfin.2024.102551>

Phan, D. N., & To, T. N. M. (2025). Determinants of market capitalization of listed firms: evidence from an emerging country. *Journal of Economics and Development*, 27(1), 38-55. <https://doi.org/10.1108/jed-06-2024-0202>

Psillaki, M., & Daskalakis, N. (2008). Are the Determinants of Capital Structure Country or Firm Specific? Evidence from SMEs *Small Business Economics*, 33 (3), 319-333.

Robins, E. M., Sandler, M., & Durand, F. (2015). Inter-relationships between the January effect, market capitalisation and value investment strategies on the JSE. *Investment Analysts Journal*, 28(50), 53-64. <https://doi.org/10.1080/10293523.1999.11082401>

Saad, G. (2024). Terrorism and its impact on the stock market: broad results from Tunisia. *LBS Journal of Management & Research*, 22(1), 110-125. <https://doi.org/10.1108/lbsjmr-12-2022-0079>

Sethi, N., Mishra, B. R., & Bhujabal, P. (2019). Do market size and financial development indicators affect human capital of select south Asian economies? *International Journal of Social Economics*, 46(7), 887-903. <https://doi.org/10.1108/ijse-07-2017-0288>

Shahed, A., & Shohana, S. (2022). Efficient Diversification Strategies: Mitigating Unsystematic Risk with DS-30 Stocks. . *Journal of Fareast International University*, 5(1), 1-10.

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance*, 19(3), 425–442. <https://doi.org/10.1111/j.1540-6261.1964.tb02865.x>

Simlai, P. (2021). Accrual mispricing, value-at-risk, and expected stock returns. *Review of Quantitative Finance and Accounting*, 57(4), 1487-1517. <https://doi.org/10.1007/s11156-021-00985-2>

Smith, J. P. (1977). Assets, Savings and labor supply. *Economic Inquiry, Western Economic Association International* 15(4), 551–561. <https://doi.org/10.1111/j.1465-7295.1977.tb01117.x>

Souffargi, W., & Boubaker, A. (2024). Impact of political uncertainty on stock market returns: the case of post-revolution Tunisia. *Cogent Social Sciences*, 10(1). <https://doi.org/10.1080/23311886.2024.2324525>

Vithessonthi, C., & Tongurai, J. (2015). The effect of leverage on performance: Domestically-oriented versus internationally-oriented firms. *Research in International Business and Finance*, 34, 265-280. <https://doi.org/10.1016/j.ribaf.2015.02.016>

Yadav, I. S., Pahi, D., & Gangakhedkar, R. (2021). The nexus between firm size, growth and profitability: new panel data evidence from Asia–Pacific markets. *European Journal of Management and Business Economics*, 31(1), 115-140. <https://doi.org/10.1108/ejmbe-03-2021-0077>

Yang, C., & Li, J. (2013). Investor sentiment, information and asset pricing model. *Economic Modelling*, 35, 436–442. <https://doi.org/10.1016/j.econmod.2013.07.015>

Zhu, Y., Taasim, S. I., & Daud, A. (2025). Volatility Modeling and Tail Risk Estimation of Financial Assets: Evidence from Gold, Oil, Bitcoin, and Stocks for Selected Markets. *Risks*, 13(7). <https://doi.org/10.3390/risks13070138>