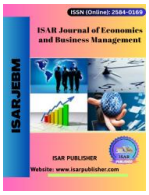
OPEN ACCESS



ISAR Journal of Economics and Business Management

Volume 3, Issue 7, 2025, Page: 46-53

Abbriviate Title- ISAR J Econ Bus Manag

ISSN *(Online)*- 2584-0169

https://isarpublisher.com/journal/isarjebm

Quantitative Analysis of Fixed-Income Securities: An Econometric Study of the Tunis Stock Exchange

Ben Hassine Skander*

PHD in economic, Departement PS2D University El Manar, Tunisia.

***Corresponding Author**

Ben Hassine Skander

PHD in economic, Departement PS2D University El Manar, Tunisia.

Article History

Received: 27.05.2025
Accepted: 01.06.2025
Published: 21.07.2025

Abstract: This study concludes that investing in bonds is a significant option for investors in the Tunis Stock Exchange, especially with the availability of historical data that offers valuable insights into the performance of these securities over an extended period. Through the application of quantitative analysis, investors can better understand the impact of various factors, such as interest rates and inflation levels, on bond returns. This understanding is essential for making informed investment decisions and for diversifying investment portfolios in line with evolving economic and financial conditions. The quantitative analysis of fixed-income securities in the Tunis Stock Exchange, conducted over the period from 1990 to 2024, reveals several important findings. Firstly, the study finds cointegration among the variables, indicating a long-term relationship between them. Secondly, it highlights the critical role of interest rates and inflation levels in determining bond yields. Lastly, the study concludes that portfolio diversification and monitoring of key economic indicators can serve as effective strategies for investors in this market. These findings underscore the importance of understanding and applying quantitative analysis to make sound investment decisions and achieve the desired returns on investments.

Keywords: Stock Exchange, Tunisia, Securities, Fixed-Income, Bonds, Quantitative Analysis, Interest Rates, Inflation.

Introduction

In an econometric study of the Tunis Stock Exchange, the quantitative analysis of fixed-income securities is essential for understanding and evaluating the performance of these assets and for assessing the risks associated with them. The analysis begins with a comprehensive overview of the general context of the stock market and the economic and political factors influencing the financial market in Tunisia. This is followed by a detailed presentation of the various types of fixed-income securities traded, along with an analysis of the characteristics and roles of each type in the market. The introduction also includes a review of key economic indicators that influence the financial market, such as interest rates, inflation rates, and economic growth indicators. At the end of the introduction, the study clarifies its objectives and the questions it seeks to answer, as well as the structure of the research paper. This foundational overview is crucial for understanding the study and its relevance and sets the stage for data analysis and the formulation of final conclusions. (*Benkraiem, R., Gaaya, S., & Lakhal, F., 2022, pp. 1–14*)

1. Problem Statement

One of the primary challenges faced in conducting a quantitative analysis of fixed-income securities in the Tunis Stock Exchange is the limited availability of reliable financial data and historical records. This issue may stem from Tunisia's underdeveloped economic infrastructure and the political challenges that affect the availability and reliability of financial data. Furthermore, the study might struggle with accurately assessing risks due to the relative stability of Tunisia’s economic and political environment, which complicates the anticipation of potential fluctuations in the future performance of fixed-income securities.

Additionally, the study may encounter difficulties in effectively applying quantitative models because of the limited data available for training and testing purposes. This limitation can reduce the accuracy of future performance forecasts and affect the quality of the study’s final results.

Overall, the quantitative analysis of fixed-income securities on the Tunis Stock Exchange faces multiple challenges, including issues related to data availability, risk forecasting, and the application of quantitative models. Addressing these problems requires advanced

Cite this article:

Skander, B. H., (2025). Quantitative Analysis of Fixed-Income Securities: An Econometric Study of the Tunis Stock Exchange. *ISAR Journal of Economics and Business Management*, *3*(7), 46-53.

strategies and innovative solutions to ensure the study's quality and the accuracy of its findings.

2. Research Objective

The main objective of this econometric study on the Tunis Stock Exchange is to provide a comprehensive and accurate assessment of the performance of fixed-income securities and to analyze the associated risks in Tunisia's financial market. The study aims to identify the factors that influence the performance of fixed-income securities and to analyze their impact on investment returns and risk levels.

Furthermore, the research seeks to explore the effectiveness of Tunisia's current monetary and economic policies on the performance of fixed-income securities and to provide recommendations for investors and policymakers based on data-driven findings.
In general, the research aims to deepen understanding of the Tunisian financial market and to offer analytical tools and evidence-based investment strategies for investors and decision-makers in this market, which is of considerable importance to the national economy.

3. Significance of the Study

The significance of this econometric study on the Tunis Stock Exchange's fixed-income securities lies in several areas. First, it offers an in-depth understanding of the Tunisian financial market, thereby increasing awareness of the challenges and opportunities in this sector. Second, it provides reliable information for investors through a detailed analysis of fixed-income securities, helping them make informed investment decisions. Third, it supports economic policymakers by offering guidance on how to improve the business environment and stimulate economic growth through the development of the capital market. Lastly, it contributes to academic and intellectual research in the field of financial analysis and capital markets, encouraging further research and innovation in this domain, and fostering knowledge development in this important area of the economy.

4. Research Methodology

This study employs the deductive method to derive conclusions based on the quantitative analysis of fixed-income securities by reviewing various theories and existing literature. It also incorporates the inductive method by observing, describing, and analyzing the current market reality. In addition, econometric tools are used to estimate the effects between variables, providing a rigorous analytical framework for understanding the dynamics of fixed-income securities in the Tunis Stock Exchange.

5. Spatial and Temporal Boundaries of the Research:

Time Period: 1990–2024.

Research Plan:

In order to clarify the relationship between the quantitative analysis of fixed-income securities on the stock exchange, the research will include the following sections:

- Research introduction
- A review of the literature that explains the relationship between the study variables
- A review of the status of fixed-income securities
- An explanation of this relationship using an econometric model, with a focus on the applied estimation and measurement mechanisms
- Presentation of the study results
- Finally, conclusions and recommendations drawn from the findings.

6. Terminology of the Study:

- **Fixed-Income Securities:** These include bonds, government bonds, corporate bonds, and municipal bonds. They are considered an investment that generates fixed income through interest or installments. Fixed-income securities are investment instruments that provide a steady income to their holder over a specified period. Bondholders typically receive periodic interest payments on the bond's face value, and in some cases, the principal is repaid at maturity. Fixed-income bonds are used as tools to diversify investment portfolios and balance risk and return. *(Watrin, C. (2019), pp. 296–317)*
- **Quantitative Analysis:** A data analysis approach that uses statistical and mathematical methods to infer relationships between variables and determine the best-fitting models to describe the data. *(Chaffee, E. C. (2019), pp. 92–162)*
- **The Stock Exchange in Tunisia:** A financial market in Tunisia where securities such as stocks and bonds are traded. The Tunis Stock Exchange is a centralized financial market facilitating transactions in securities like stocks, bonds, government securities, and Sukuk among investors. Established in 2004 in Baghdad, it aims to help local and foreign companies raise capital and provide investment opportunities. It contributes to economic infrastructure by promoting finance and developing the Tunisian financial market. It ensures transparency and efficiency in trading and offers a safe, regulated environment for investment. *(Chen, Y. (2016), pp. 19–37)*
- **Independent Variables:** Variables assumed to affect the dependent variable in the study without being influenced by other variables. *(Zhou, H. (2020), pp. 1–20)*
- **Dependent Variable:** The variable whose changes are analyzed using data and statistical models, such as bond yields in this case. *(Rasiah, R. (2016), pp. 61–83)*
- **Statistical Models:** Tools used to analyze data and determine relationships among various variables, such as the Ordinary Least Squares (OLS) model. *(Chireka, T. (2020), pp. 102–110)*
- **Expected Outcomes:** Predictions or results obtained from applying statistical models to data, which can guide future behavior in financial markets. *(Chen, Y. (2016), pp. 19–37)*
- **Bond Investment:** Refers to purchasing bonds as an investment vehicle to achieve a fixed return. Investors buy bonds issued by governments, corporations, or other entities to gain predictable returns through interest over a specific period. Bonds represent written promises to

repay investors with periodic interest and principal at maturity. Bonds are essential financing tools used by governments and companies to fund their projects and financial needs. *(Lassnoni, Hafiza, pp. 425–426)*

- **Interest and Inflation Rates:** Critical factors in financial market analysis that affect bond yields and other assets and reflect the state of the economy and inflation levels.
    - *Interest Rates:* Represent the cost of borrowing or return on deposits.
    - *Inflation:* Denotes a general increase in price levels over time, reducing the currency's purchasing power.

      There is a strong interrelationship between interest rates and inflation. For example, high interest rates can suppress inflation, whereas low rates can stimulate spending and lead to inflation. Investors closely monitor these indicators to assess their impact on financial decisions. *(Meftah Saleh & Bouabdellah Ali, 2013, pp. 114–120)*

7. Quantitative Analysis of Fixed-Income Securities: In Economic Literature

In economic literature, the quantitative analysis of fixed-income securities is a crucial subject attracting interest from researchers and financial market analysts. These studies rely on mathematical and statistical models to analyze financial data and predict price and return changes.

Key topics covered include:

- **Asset Valuation and Risk Management:** Developing models for valuing fixed-income assets and assessing associated risks to support portfolio allocation and risk management.
- **Impact of Economic and Political Events:** Analyzing the effects of events such as interest rate changes, inflation, and monetary policy on fixed-income security performance.
- **Technical Analysis and Price Forecasting:** Employing mathematical models to analyze price trends and predict market movements.
- **Monetary Policies and Market Impact:** Exploring how interest rate changes and monetary policy affect fixed-income securities and investor behavior.

These areas form part of the wide body of research in quantitative analysis of fixed-income securities and contribute to the advancement of tools and theories used to understand and analyze the financial markets. *(Matar, Mohammed, 2013, pp. 5–6)*

The Role of Quantitative Analysis of Fixed-Income Securities: In Tunisia

In Tunisia, quantitative analysis plays a vital role in enhancing the transparency and efficiency of the financial market and supporting investment and policy decisions.

Key roles include:

- **Asset Valuation and Risk Management:** Assisting investors and financial institutions in evaluating available fixed-income assets (e.g., government and corporate bonds) and analyzing investment risks.
- **Supporting Investment Decision-Making:** Providing reliable data and reports that enable informed decision-making based on current conditions and future expectations.
- **Enhancing Transparency and Market Trust:** Offering objective and informed analyses increases investor trust and market activity.
- **Guiding Economic Policies:** Offering recommendations and insights for economic and financial policy formulation to support market stability.
- **Improving Market Efficiency and Reducing Volatility:** By analyzing data and applying quantitative models, market fluctuations can be better understood, contributing to more stable and efficient financial markets.

Quantitative analysis thus contributes significantly to the development of the financial market in Tunisia and provides a stable and attractive investment environment. *(Aghouat, Tawfiq Massih Mohammed, 2015, pp. 21–30)*

Supporting Quantitative Analysis of Fixed-Income Securities: In Tunisia

Promoting quantitative analysis in this field requires collective efforts across various sectors. This includes:

- **Providing Data and Information:** Ensuring reliable and comprehensive financial and economic data is available for researchers and analysts.
- **Enhancing Technical and Technological Infrastructure:** Developing the tools and systems needed to collect, store, and analyze financial data effectively.
- **Professional Training and Development:** Offering training programs and workshops to enhance analysts' skills in using quantitative methods and tools.
- **Encouraging Research and Innovation:** Supporting academic research and innovation through funding and resource allocation.
- **Stimulating Market Participation:** Creating a favorable legal and regulatory environment to build trust and attract investors.

Through these coordinated efforts, Tunisia can strengthen the role of quantitative analysis in its financial market and contribute to broader economic growth and development. *(Zargoun, Mohamed, 2015, pp. 3–9)*

$$BY = f(ITR, IR, GDP, RS, FI) \quad (1)$$

8. Données et méthodologie de mesure :

The following measurement model was estimated based on equation (1), using the Ordinary Least Squares (OLS) method, which aims to minimize the sum of squared deviations between

observed and predicted values. This method provides the Best Linear Unbiased Estimators (BLUE). It is worth noting that the equation was transformed into a logarithmic form and presented as follows

$$\ln BY_{it}=\beta 0+ \beta 1 \ln ITR_{it}+\beta 2 \ln IR_{it}+it\beta 3 \ln GDP_{it}+\beta 4 \ln RS_{it}+ \beta 5 \ln FI_{it} +ui_t \quad (2)$$

Where the symbol (ln) denotes the natural logarithm of the variable. The bond yield (BY) is the dependent variable, while the independent variables are the interest rates (ITR), inflation rates (IR), gross domestic product (GDP), retail sales (RS), and fixed investments (FI), as follows:

Bond Yield (BY) = $\beta_0 + \beta_1(ITR) + \beta_2(IR) + \beta_3(GDP) + \beta_4(RS) + \beta_5(FI) + \varepsilon$

Where:

- **β_0, β_1, β_2, β_3, β_4, and β_5** are the regression coefficients that represent the impact of each independent variable on the bond yield;
- **ε** is the error term or disturbance.

This statistical model is used to understand the relationship between bond yields and the independent variables. Regression analysis allows for the estimation of the β coefficients and the assessment of the relative impact of each explanatory variable on bond yields.

Before conducting the econometric analysis, the researcher relies on a set of preliminary tests to ensure the stationarity of the data. This is essential to avoid measurement errors and to ensure that no spurious correlations exist among the model variables.

8.1. Stationarity Test of the Time Series Variables in the Model:

The stationarity of the time series for the model's variables is tested using the **Augmented Dickey-Fuller (ADF) test** for unit roots. **Table 1** shows the results of the unit root test using the ADF approach. It appears that all variables are **non-stationary at level**, according to the **Akaike and Schwarz information criteria**.

Therefore, the ADF test was reapplied after taking the **first difference**, using the same lag length. The variables **FI, RS, and GDP** became **stationary at the first difference**, at the **5% significance level**. Meanwhile, the variables **BY, ITR, and IR** became **stationary only after the second difference**, also at the **5% level**. This indicates that all time series in the model have achieved stationarity after differencing.

8.2. Results of the Optimal Lag Length Selection Test:

The optimal number of lags was selected based on the values of the **Akaike Information Criterion (AIC)** and the **Schwarz Criterion (SC)**. The results of both criteria indicate that:

- The lowest value for the **BY** variable was achieved at the **fourth lag**;
- The **ITR** variable had its lowest AIC/SC at the **second lag**;
- The remaining variables reached their optimal values at the **first lag**.

Applying this optimal lag structure to the statistical tests revealed that the models are **statistically significant** and provide **robust results**, as shown in **Table 1**.

variables Endogenous		*level*	*st 1 difference*	*nd 2 difference*	*Test critical values level %5*
BY	***t-Statistic***	***0.539503***	***2.766287***	***3.952379***	***3.081002***
	Prob	***0.8571***	***0.2273***	***0.0328***	***3.710482***
ITR	***t-Statistic***	***2.880941***	***2.540172***	***5.962991***	***3.710482***
	Prop	***0.1947***	***0.3075***	***0.0009***	
IR	***t-Statistic***	***0.699851***	***4.377746***		***3.690814***
	Prop	***0.9580***	***0.0143***		
GDP	***t-Statistic***	***2.062371***	***5.328695***		***3.690814***
	Prop	***0.5324***	***0.0025***		
RS	***t-Statistic***	***5.667165***	***4.329917***		***3.690814***
	Prop	***1.0000***	***0.0157***		
FI	***t-Statistic***	***1.759801***	***3.155864***	***4.595154***	***3.733200***
	Prop	***0.6835***	***0.1240***	***0.0114***	

Prepared by the researcher using EViews software

Table (2): VAR Optimal Lag for the model used, according to AIC and SC criteria

Endogenous variables	*Lag*	*AIC*	*SC*
BY	***4***	****9.965805***	****10.18309***
ITR	***1***	****47.39790***	****47.48482***
IR	***2***	****4.156273***	****4.286646***
GDP	***1***	****15.45371***	****15.54063***
RS	***1***	****22.88345***	****22.97036***
FI	***1***	****6.908546***	****6.995461***

Prepared by the researcher using EViews software

8.3. Cointegration Test for Time Series:

If the time series variables are non-stationary at their levels, meaning they are integrated of order one, then the Johansen-Juselius cointegration test can be applied, including the Trace Test and the Maximum Eigenvalue Test. This is shown in the following Table (3).

Table (3)

%10 level	*level %5*	*level %1*	*t-Statistic*	*Lag*
3.297799	***3.710482***	***4.616209***	***4.109321***	***2***

Prepared by the researcher using EViews software

According to the results of the previous table, we can reject the null hypothesis and accept the alternative hypothesis because the calculated value of (τ) (4.10932) is greater than the critical value at the significance levels of 5% and 10%. This means that the estimated residual series do not contain unit roots, i.e., they are stationary. In other words, there is cointegration between the time series variables, indicating the existence of a long-term relationship among the variables.

The same result can be clarified through Table (4), where it is evident that the calculated value of the trace test is greater than the critical value at the 1% significance level. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states that there is at least one cointegration vector between the variables. This indicates the presence of a stable linear combination between (BY) and the influencing variables, confirming the existence of a long-term equilibrium relationship among the variables in the model.

Table (4)

	0.01	*Trace*		*Hypothesized*
*Prob.***	*Critical Value*	*Statistic*	*Eigenvalue*	*No. of CE(s)*
0.0002	***77.81884***	***94.32096***	***0.914894***	***None ****
0.0312	***54.68150***	***49.97148***	***0.732507***	***At most 1***
0.1218	***35.45817***	***26.23556***	***0.523332***	***At most 2***
0.118 6	***19.93711***	***12.89871***	***0.449423***	***At most 3***
0.1420	***6.634897***	***2.156512***	***0.112908***	***At most 4***

Prepared by the researcher using EViews software

Results:

In light of the results of the cointegration test presented in the previous section, we proceed to estimate the regression equation in both the short-run and long-run as follows:

Long-Run Relationship Estimation:

In this step, the variables from Equation (2) (as previously presented) are estimated using the **Ordinary Least Squares (OLS)** method over the period from **1990 to 2024**.

Table (5): Estimation of the Long-Run Effect

Let me know if you'd like me to translate the contents of Table 5 or draft an English-formatted version of the estimation results.

Dependent Variable	***Independent Variable***	***Coefficient***	***Prob***
BY	***C***	***0.005414-***	***0.0639***
	ITR	***0.065510***	***0.0449***
	IR	***0.040176***	***0.0285***
	GDP	***0.000955***	***0.0106***
	RS	***0.007253***	***0.0575***
	FI	***0.002763-***	***0.8487***
	R-squared	***0.489305***	
	Prob(F-statistic)		***0.010182***

Prepared by the researcher using EViews software

9.1 Long-Run Relationship Estimation Results:

From the results shown in **Table (5)**, we observe a statistically significant **positive long-run effect** of all the independent variables on the dependent variable (BY – Bond Yield). This implies that an increase in the inflation rate will lead to an increase in bond yields. Specifically:

- A **1% increase** in the **interest rate (ITR)** results in an increase of **0.06** in bond yields.
- A **1% increase** in **inflation rate (IR)** leads to a **0.04** increase in bond yields.
- A **1% increase** in **retail sales (RS)** contributes to a **0.007** rise in bond yields.
- A **1% increase** in **GDP** causes a **0.009** increase in bond yields.

9.2. Short-Run Relationship Estimation:

After confirming that the time series of the model variables are **non-stationary at level** but **stationary at first difference**, and that they are **cointegrated**, we can conclude that there is a **long-run equilibrium relationship** among the variables based on **Engle and Granger**'s approach.

Therefore, we proceed to estimate the **Error Correction Model (ECM)**, which enables the examination and estimation of **short-run relationships** while avoiding spurious regression issues. Moreover, ECM accounts for the dynamic interaction between the **short-run adjustments** and **long-run equilibrium** between the dependent and explanatory variables.

The ECM is estimated by including the **lagged error term** (the residuals from the long-run equation) along with the **first differences** of the non-stationary variables, as shown in the following equation:

$$BY_t = b_0 + b_1 ITR_t + b_2 IR_t + b_3 GDP_t + b_4 RS_t + b_5 FI_t + \lambda ECM_{t-1}$$

The appearance of **(ECM t-1)** in the above equation reflects the **prior hypothesis** that the **value of the dependent variable in the short term** does **not equal its long-run equilibrium value**. This adjustment term (ECM t-1) measures the **speed at which short-term disequilibria are corrected** to return to long-run equilibrium.

Table (6): Estimation of Short-Run Effect

Dependent Variable	*Independent Variable*	*Coefficient*	*Prob*
BY	*C*	*0.011267-*	*0.0570*
	ITR	*0.100778*	*0.0259*
	IR	*0.037556*	*0.0346*
	GDP	*0.024235*	*0.1248*
	RS	*0.023867*	*0.0588*
	FI	*0.009317-*	*0.5113*
	(1-)U	*0.515006-*	*0.0208*
	R-squared	*0.614013*	
	Prob(F-statistic)		*0.053323*

Prepared by the researcher using EViews software

From the results of the Error Correction Model (ECM) in **Table (6)** above, it is evident that the **error correction term (ECTt-1)**—derived as a residual from the long-run regression with one lag—is **negative and statistically significant**, which is the most important coefficient in estimating short-run relationships. This term captures **deviations from long-run equilibrium**. When it is **negative and significant at the 1% level**, it confirms the presence of a **stable long-run relationship**. It also implies stability in the adjustment process and represents the **speed of adjustment** in the current period to return to long-run equilibrium.

This finding aligns with the test results, where the error correction coefficient equals **(-0.51)**, and its significance value in the model is **(0.0208)**. This means the speed of adjustment is **51%**, indicating that within **one period—i.e., one year**, the short-run disequilibrium is corrected, and the system returns to a new equilibrium state.

The short-run regression results indicate that a **1% increase in (ITR)** leads to an increase of **(0.10)** in bond yields. Similarly, a 1% increase in **(IR)** and **GDP** leads to increases of **(0.03)** and **(0.02)**, respectively. A 1% increase in the **communications sector (RS)** leads to a **(0.02)** increase in bond yields. These findings are consistent with those derived from the descriptive analysis of the data.

Conclusion:

This study aimed to assess the **quantitative analysis of fixed-income securities** on the stock exchange during the period **1990–2024**. The **Ordinary Least Squares (OLS)** method was used to

evaluate **long-run and short-run effects** on bond yields using annual time series data.

The empirical results showed the presence of **cointegration among variables**, indicating a **long-run relationship** between them. This is evidence of a **direct relationship between economic policies and bond yields**. Bond yields are significantly affected by **economic movements and the monetary and fiscal policies** implemented by governments and central banks. Additionally, **interactions across financial markets** can play a major role in determining bond returns. For instance, bond yields may react to **fluctuations in the stock market** or **commodity prices**.

Studies also suggest that **investor expectations** regarding **inflation and future interest rates** significantly affect bond yields. For example, bond yields may rise in response to expectations of higher future interest rates.

Changes in global and regional economic conditions also play an important role. Major global events, such as **financial crises**, can cause volatility in financial markets and, in turn, impact bond returns.

Based on these and other factors, **quantitative analysis of fixed-income securities** reveals **cointegration among financial variables**, suggesting **long-term relationships** and explaining the complex dynamics of financial markets and their effects on bond returns.

Moreover, the results show that the **impact of independent variables** varies across **sectors in the short run**, while in the **long run**, the effect appears **more uniform** across all sectors.

It is important to note that the study's findings align with the **nature of an economy striving for stability and balance** in financial markets. By understanding the factors that influence bond yields, **investors and policymakers** can better **guide their strategies and make informed decisions**.

Using the results of this study, **investment strategies** can be developed based on **market expectations** and analysis of **bond demand and supply factors**. Moreover, the findings can be used to guide **monetary and fiscal policies** aimed at strengthening financial and economic stability.

Overall, understanding the **relationships among various factors influencing bond yields** helps build **confidence in financial markets** and supports **economic stability**. Hence, the results obtained from this study can play a vital role in **enhancing our understanding of market dynamics** and **improving our ability to forecast trends** and **make sound investment decisions**.

Recommendations:

Based on the study's findings, the following recommendations are presented:

1. **Portfolio Diversification**:

   Investors should diversify their portfolios by including **fixed-income assets such as bonds**, based on forecasts derived from statistical models.

2. **Monitoring Economic Factors**:

   Policymakers and investors must closely track **supply and demand factors**, such as **interest rates, inflation, and GDP**, and understand their effects on bond returns.

3. **Improving Monetary and Fiscal Policies**:

   Economic policymakers should adopt **appropriate monetary and fiscal measures** that enhance financial stability and investor confidence.

4. **Targeting High-Yield, Low-Risk Investments**:

   The findings may reveal **specific investment opportunities** in high-yield, low-risk assets, allowing investors to benefit from **profitable returns**.

5. **Implementing Smart Trading Strategies**:

   Traders and investors can utilize the results to develop **smart trading strategies** based on **market analysis and economic expectations**.

6. **Ongoing Research and Analysis**:

   Financial researchers and analysts should continue conducting **qualitative and quantitative studies** to better understand market dynamics and forecast **future trends in financial markets**.

References

1. Saleh, M., & Ali, B. A. (2013). The Reality of Foreign Investment in Global Arab Markets. *Journal of Economic and Administrative Research*, University of Mohamed Khider Biskra, Faculty of Economic, Commercial and Technological Sciences, Issue 14, pp. 114–120.
2. Matar, M. (2013). *Modern Trends in Financial and Credit Analysis: Methods, Tools, and Uses of Finance* (2nd ed.). Amman, Jordan: Wael Publishing House, pp. 5–6.
3. Al-Aghwat, T. M. (2015). The Role of Financial Indicators in Evaluating the Financial Performance of the Arab Boats Company *(Unpublished Master's Thesis)*. Al-Isra University, Jordan, pp. 21–30.
4. Aqeel, S. M., & Al-Lulu, S. (2015). The Ability of the Economic Value Added Index versus Traditional Performance Indicators to Explain Changes in Market Value of Shares: An Applied Study on Companies Listed in the Palestine Stock Exchange *(Unpublished Master's Thesis)*. Islamic University, Gaza, Palestine.
5. Chenine, A. N., & Zargoun, M. (2015). A Study of the Ability of Traditional and Modern Indicators to Explain the Financial Performance of Institutions: A Case Study of the Algerian Stock Exchange (2000–2013). *Quantitative Economics Studies*, University of Kasdi Merbah, Issue 1, pp. 3–9.
6. Zargoun, M., Hajjaj, N., & Hajjaj, S. (2018). A Study of the Ability of Traditional and Modern Financial Performance Indicators to Explain Stock Returns: A Case Study of Companies Listed in the Qatar Stock Exchange (2010–2015). *Franchise for Economic and Management Research*, Amar Telidji University of Laghouat, Faculty of Economic, Commercial and Management Sciences, Vol. 2, No. 3.
7. Mabouk, B. (2019–2020). *Lectures on the Securities Market System Standard*. University of Malien Debaghni Sétif 2, Faculty of Law and Political Sciences.

8. Karim, Z. (2019–2020). *Lectures on the Stock Market Law Standard*. Akli University, Faculty of Economic, Commercial and Management Sciences.

9. Ben Meeta, D., & Boudayat, J. (2014). A Case Study of the Stock Market: Kingdom of Saudi Arabia (2005–2014). *Bella for Business Administration and Economic Studies*.

10. Bouabdallah, D., & Bouksba, D. (2015). Economic Determinants of Foreign Portfolio Investment in the Stock Market: A Case Study of Amman Stock Exchange – Jordan (1994–2015). *Journal of Human Sciences*, University of Mohamed Khider Biskra, Issue 47.

11. Lessenouni, H., & Bachounda, R. (2016). The Financial Market in Light of the Application of the Financial Accounting System: Reality and Prospects. *Journal of Finance and Markets*, 03(06), pp. 425–426.

12. Boumediene, N. (2015). Financial Engineering Industry and Its Impact on Emerging Markets – Arab Financing *(Unpublished Doctoral Thesis)*. Hassiba Benbouali University, Chlef.