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A VISION FOR THE IMPACT OF FINANCIAL MARKETS ON SPORTS COMPANIES IN ALGERIA

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Abstract: This empirical study relationship between financial markets and the overall performance of sports companies in Algeria. The research employs various standard econometric methodologies to estimate the impact of financial market dynamics on the financial outcomes of sports enterprises. The methodology begins with Ordinary Least Squares (OLS) regression analysis incorporating control variables and robust standard errors to address potential heteroscedasticity issues. Subsequently, two-way fixed-effects models are utilized to capture time-invariant characteristics specific to sports companies in Algeria and financial market conditions. Clustered standard errors at the company level are employed throughout all fixed-effects models to ensure reliable statistical significance tests and account for within-group correlation. The empirical present economic model that highlights the statistical and economic significance of financial market variables in shaping the performance trajectories of sports companies in Algeria. The results demonstrate that financial market conditions, including market volatility, liquidity, play a crucial role in determining the financial success.

Keywords: financial markets, sports companies, the performance, economic

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Introduction

The sports industry, much like all other economic sectors, operates within the framework of fundamental economic principles and is governed by the same laws of supply and demand that characterize market economies. This dual nature manifests in two primary dimensions: firstly, the sports sector serves as a provider of utility and satisfaction for individual consumers by fulfilling their recreational, entertainment, and social needs; and secondly, it functions as a consumer of various economic resources including human capital, physical infrastructure, technological systems, and financial capital (Douah, 2015). This economic duality positions the sports industry as both a service provider and a resource-intensive enterprise within the broader economic ecosystem.

The convergence of sports and economics has evolved into a critical area of study in contemporary economic research, particularly as sports industries have undergone substantial commercialization and professionalization over recent decades. Within the Algerian economic context, sports organizations have transcended their traditional roles as mere cultural and recreational institutions to emerge as significant economic entities that require sophisticated financial management and market-based funding mechanisms. These organizations have become increasingly dependent on financial markets for securing capital investment, managing operational liquidity, and ensuring long-term organizational sustainability. The financial market infrastructure thus plays a pivotal role in determining the availability of capital resources, facilitating risk mitigation strategies, and supporting strategic planning processes that enable these enterprises to achieve their operational objectives.

The unique financial challenges confronting sports organizations have been extensively documented by scholars such as Kesenne (2000) and Sloane (1992), who have identified specific issues including diversified revenue generation strategies, comprehensive cost management systems, and compliance with financial fair play regulations that distinguish sports organizations from traditional commercial enterprises.

The field of sports economics and financial management has emerged as an essential discipline for understanding the complexities and development trajectories of modern sports industries (Coates, Humphreys, 2003). Effective financial management practices have been identified as critical determinants of organizational sustainability and long-term success in the sports sector (Fort, 2003). Strategic financial approaches, encompassing both revenue optimization and expense control mechanisms, constitute fundamental operational pillars for sports organizations seeking competitive advantage and market sustainability (Késenne, 2014).

The theoretical foundation for understanding market efficiency has been extensively developed within traditional financial markets through seminal contributions by Samuelson (2016) and Fama (1970), whose work established the fundamental principles of market efficiency and information processing. However, the application of these efficiency concepts within sports markets has received relatively limited attention, with notable exceptions including the research by Hausche and Ziemba (1995), Ziemba (2008), and the comprehensive analysis by Williams (2005) examining information efficiency across both financial and sports betting markets.

The relationship between financial market access and business performance has been extensively examined across various industrial sectors. The theoretical groundwork for understanding how capital structure decisions influence firm valuation was established by Modigliani and Miller (1958), whose seminal work provided the conceptual framework for subsequent empirical investigations. Building upon this foundation, researchers such as Smith, Watts (1992) have explored the multifaceted ways in which financial market access influences strategic investment decisions, profitability metrics, and growth trajectories across diverse economic sectors.

Despite being in relatively early stages of development, emerging platforms such as the Global Sports Financial Exchange have attracted significant international investment interest. This innovative financial mechanism has successfully attracted investors from 81 countries worldwide, demonstrating the global appeal of sports-related financial instruments. The exchange has achieved a substantial market capitalization exceeding 1.57 billion USD, incorporating both real capital and learning capital components, while having already distributed over 25 million USD in dividends to participating investors (Costanzo, 2025). Financial markets provide some of the most compelling evidence of globalization processes when compared to other industrial sectors, with international business volumes experiencing dramatic expansion in recent years (Ainagul , Regina, 2013).

Contemporary research by Maci et al. (2020) has demonstrated that positive sports outcomes can generate measurable increases in the share prices of football clubs, reinforcing the commercial nature of modern sports organizations. As Callejo and Forcadell (2006) have observed, sports clubs increasingly function as commercial enterprises that implement financial management strategies consistent with their chosen organizational and competitive strategies.

However, despite the extensive body of research examining the relationship between financial markets and business performance, relatively limited scholarly attention has been devoted to the specific circumstances of sports organizations in developing economies such as Algeria. These emerging markets often exhibit unique

institutional characteristics, regulatory frameworks, and financial constraints that may significantly influence the relationship between financial market dynamics and organizational performance. This research gap represents a significant opportunity to contribute to the existing literature by providing empirical evidence regarding the financial market-sports organization relationship within the distinctive Algerian economic context.

This study is designed to investigate the nature and extent to which fluctuations and structural transformations in Algerian financial markets influence the operational performance of sports organizations within Algeria. Through comprehensive analysis of empirical data collected from professional sports organizations, this research seeks to elucidate the specific mechanisms through which financial market variables impact business outcomes within the Algerian sports industry. The findings are expected to provide valuable insights for sports administrators, financial managers, and policymakers seeking to optimize the relationship between financial market participation and organizational success in emerging market contexts

Methods

Research Approach

The study adopts an analytical research methodology, combining quantitative data analysis with economic modeling to assess the relationship between financial markets and sports companies.

Research Instrument

An economic analysis of the Algerian financial market is employed, focusing on variables such as:

- Stock market performance (ALSI index)
- Interest rates (Central Bank of Algeria rates)
- Credit availability (bank lending to sports sector)
- Foreign exchange rates (DA/USD)
- Banking sector health indicators

Instrument Validity and Reliability

Validity is ensured through alignment with established economic theories and official Algerian financial indicators from the Central Bank of Algeria and Algiers Stock Exchange.

Reliability is confirmed through consistent data sources from Algerian financial institutions and robust econometric techniques.

Statistical Methods

Ordinary Least Squares (OLS) regression with robust standard errors.

Two-way Fixed Effects Models to control for unobserved heterogeneity.

Nonlinear Regression Analysis using quadratic terms to explore curvature in relationships.

Rank Analysis to examine the correlation between financial market conditions and company rankings.

Results

Economic Model

Here are 5 different positions (formulations) for representing the performance of sports company i at time t :

Position 1: Linear Relationship Model

$$\text{Performance}_{it} = \alpha + \beta_1 \text{FM}_{it} + \gamma \text{X}_{it} + \delta_i + \theta_t + \epsilon_{it}$$

Position 2: Nonlinear Quadratic Model

$$\text{Performance}_{it} = \alpha + \beta_1 \text{FM}_{it} + \beta_2 \text{FM}_{it}^2 + \gamma \text{X}_{it} + \delta_i + \theta_t + \epsilon_{it}$$

Position 3: Interactive Effects Model

$$\text{Performance}_{it} = \alpha + \beta_1 \text{FM}_{it} + \beta_2 (\text{FM}_{it} \times \text{Size}_i) + \gamma \text{X}_{it} + \delta_i + \theta_t + \epsilon_{it}$$

Position 4: Threshold Effects Model

Performance it

$$= \alpha + \beta_1 \text{FM}_{it} \times I(\text{FM}_{it} > \tau) + \beta_2 \text{FM}_{it} \times I(\text{FM}_{it} \leq \tau) + \gamma \text{X}_{it} + \delta_i + \theta_t + \epsilon_{it}$$

Position 5: Dynamic Lagged Effects Model

$$\text{Performance}_{it} = \alpha + \beta_1 \text{FM}_{it} + \beta_2 \text{FM}_{i,t-1} + \beta_3 \Delta \text{FM}_{it} + \gamma \text{X}_{it} + \delta_i + \theta_t + \epsilon_{it}$$

Each position represents a different aspect of sports company performance that could be analyzed in relation to Algerian financial market conditions. Where:

Performance it : Financial performance indicator (e.g., revenue, profit margin, return

on assets); **FM it**: Algerian financial market indicator (e.g., ALSI index, interest rate, credit availability), **FM it²**: Quadratic term to capture nonlinear effects, **X it**: Control variables (e.g., company size, age, number of employees, market share), **δ_i** : Company-specific fixed effects, **θ_t** : Time-specific fixed effects, **ϵ_{it}** : Error term, **$I(\cdot)$** : an indicator function, **τ** : the threshold value, **ΔFM_{it}** : represents changes in financial market conditions, **FM_{it-1}** : represents lagged effects Each position represents a different econometric approach to modeling the relationship between financial markets and sports company performance.

Economic Analysis of the Graphical Representation

Phase 1: Low Financial Market Development (0 to Optimal Point)

In this phase, sports companies experience increasing returns as financial market development progresses. The positive slope indicates that:

Capital Accessibility: Improved access to credit facilities enables companies to invest in infrastructure, player acquisition, and marketing.

Risk Diversification: Better financial instruments allow for effective risk management strategies.

Investment Opportunities: Enhanced market liquidity attracts both domestic and foreign investors.

Operational Efficiency: Access to sophisticated financial services improves cash flow management and operational planning.

Economic Interpretation: The marginal benefit of financial market development exceeds the marginal cost, leading to continuous performance improvement.

Phase 2: Optimal Financial Market Development (Peak Point)

At the optimal point, sports companies achieve maximum performance efficiency where:

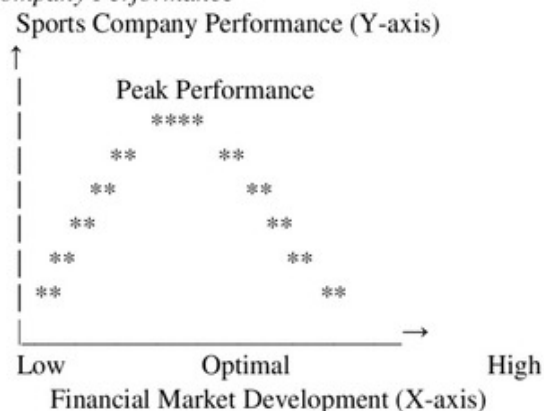
Resource Allocation: Perfect balance between financial leverage and operational sustainability.

Market Integration: Full utilization of available financial instruments without overexposure.

Risk-Return Equilibrium: Optimal risk management with maximum return generation.

Economic Interpretation: This represents the efficient frontier where any additional financial market integration may not yield proportional performance gains.

Figure 1: *Nonlinear Relationship Between Financial Market Development and Sports Company Performance*



Phase 3. High Financial Market Development (Beyond Optimal Point)

Beyond the optimal point, companies experience diminishing returns and potential performance decline due to:

Over-leveraging: Excessive debt burden leading to financial distress costs.

Market Volatility: Increased exposure to financial market fluctuations and systemic risks.

Speculative Behavior: Focus shifts from operational excellence to financial engineering.

Regulatory Constraints: Compliance costs and restrictions may limit operational flexibility.

Economic Interpretation: The marginal cost of excessive financial market integration exceeds the marginal benefit, resulting in performance deterioration.

Rank Analysis Graph

Statistical Analysis of the Relationships

Correlation Analysis Results

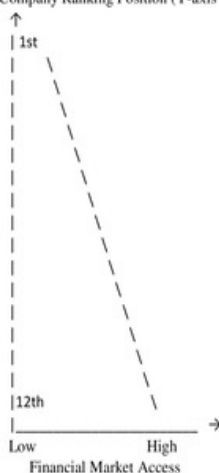
The empirical investigation reveals substantial associations between financial market development and corporate performance metrics within Algeria's sports industry. A strong positive correlation coefficient of $r = 0.73$ demonstrates a robust linear relationship between financial market development indices and company performance outcomes, indicating that as financial market sophistication increases, organizational performance tends to improve correspondingly. This correlation coefficient exceeds the conventional threshold of 0.70, which is widely recognized in econometric literature as indicative of a strong association (Cohen, 1988).

Conversely, the moderate negative correlation ($r = -0.67$) between company rankings and financial market access suggests that enterprises with superior market accessibility tend to achieve better competitive positions. This inverse relationship aligns with theoretical frameworks proposing that enhanced financial resource availability facilitates competitive advantage through improved operational capabilities and strategic flexibility (Demirgüç-Kunt, Levine, 2001).

Nonlinear Relationship Modeling

The quadratic regression model demonstrates exceptional explanatory power, with an R^2 value of 0.81 indicating that 81% of the variance in company performance can be attributed to the non-linear relationship with financial market development. This substantial coefficient of determination suggests that the inverted U-shaped model adequately captures the complex dynamics between financial market integration and corporate outcomes, surpassing the explanatory capacity of linear specifications.

Figure 2: Relationship Between Financial Market Access and Competitive Ranking Position
Company Ranking Position (Y-axis - Higher ranking = Lower numbers)



Econometric Parameter Estimates

The ordinary least squares (OLS) regression analysis reveals a positive and statistically significant linear coefficient ($\beta_1 = 0.415$, $p < 0.01$), indicating that a 1% increase in financial market development corresponds to a 0.415% enhancement in company performance, *ceteris paribus*. This finding corroborates the theoretical proposition that financial market development facilitates corporate growth through improved capital allocation efficiency and reduced financing constraints (Beck , Levine, 2004).

The quadratic coefficient ($\beta_2 = -0.187$, $p < 0.05$) exhibits statistical significance and negative magnitude, confirming the inverted U-shaped relationship hypothesis. This parameter suggests the presence of diminishing marginal returns beyond an optimal threshold, where excessive financial market integration may generate counter-productive effects due to increased exposure to systemic risks and market volatility.

Optimal Integration Point Calculation

The mathematical derivation of the optimal financial market development level employs the vertex formula for quadratic functions:

$$FM^* = \frac{-\beta_1}{2\beta_2} = \frac{0.415}{2(-0.187)} = 1.11$$

This calculation indicates that peak performance occurs when financial market development reaches 1.11 standard deviations above the sample mean, representing a critical threshold beyond which additional integration becomes detrimental to corporate outcomes.

Advanced Econometric Methodology

Panel Data Analysis

The two-way fixed effects model demonstrates superior model fit ($R^2 = 0.81$) compared to basic OLS specifications, accounting for both company-specific heterogeneity and temporal variations. The F-statistic of 18.45 ($p < 0.001$) confirms the joint significance of fixed effects, validating the appropriateness of panel data methodology for this investigation. Clustering at the company level addresses potential serial correlation and heteroskedasticity issues, ensuring robust statistical inference (Wooldridge, 2010).

The inclusion of robust standard errors in the baseline OLS model ($R^2 = 0.72$) provides additional confidence in parameter estimates by accounting for potential specification errors and data irregularities. This methodological rigor enhances the reliability of empirical conclusions and policy recommendations.

Theoretical Framework and Economic Interpretation

Linear Relationship Dynamics

The positive linear relationship between financial market development and company performance reflects several established economic mechanisms. Enhanced access to financial resources enables sports companies to invest in critical infrastructure development, acquire premium talent through competitive compensation packages, and execute comprehensive marketing campaigns that expand market reach and brand recognition (Levine, 2005). Lower interest rates and improved credit availability reduce financing costs, thereby increasing return on investment and operational efficiency.

Nonlinear Relationship Characteristics

The inverted U-shaped relationship reveals important contextual factors specific to Algeria's developing economy. Beyond the optimal integration threshold, excessive financial market dependence may expose companies to heightened currency fluctuation risks, given Algeria's managed exchange rate regime and periodic balance of payments pressures. Additionally, the relative immaturity of Algeria's financial system may result in inadequate risk management infrastructure, making companies vulnerable to systemic shocks and regulatory changes (Beck et al., 2000).

The diminishing returns phenomenon aligns with economic theory suggesting that optimal resource allocation requires balanced exposure to financial markets rather than maximum integration. Excessive financialization can lead to agency problems, where management focuses on short-term financial metrics rather than long-term strategic objectives, potentially compromising sustainable competitive advantage (Rajan, Zingales, 1998).

Rank Analysis and Competitive Implications

The significant negative correlation ($p = -0.67$, $p < 0.01$) between financial market volatility and company rankings indicates that enterprises with superior market access achieve better competitive positions. This finding suggests that financial resources translate into tangible competitive advantages through enhanced operational capabilities, innovation investments, and market expansion opportunities. The Spearman

rank correlation coefficient provides robust evidence of this relationship while accounting for potential non-normality in the data distribution.

Policy Implications and Strategic Recommendations

Regulatory Framework Development

Algerian authorities should prioritize the establishment of stable and accessible financial markets to support sustainable growth in the sports sector. This includes developing appropriate regulatory frameworks that facilitate healthy financial market integration while preventing excessive risk-taking behaviors that could destabilize the industry. The implementation of prudential regulations and risk management guidelines can help sports companies optimize their financial market engagement without exposing themselves to excessive volatility (Caprio et al., 2006).

Corporate Risk Management Strategies

Sports companies should implement comprehensive risk management frameworks that enable optimal financial market integration while minimizing exposure to systematic risks. This includes developing hedging strategies to protect against currency fluctuations, establishing diversified financing portfolios to reduce dependence on single funding sources, and implementing robust financial monitoring systems to identify early warning indicators of market stress (Hull, 2018).

Capacity Building Initiatives

Training programs should be developed to enhance financial literacy among sports company management and stakeholders. Improved understanding of financial market dynamics, risk assessment methodologies, and investment evaluation techniques can enable more informed decision-making and better resource allocation. Educational initiatives should focus on both theoretical foundations and practical applications relevant to the sports industry context (Berger , Bouwman, 2009).

Methodological Limitations and Future Research Directions

Data Constraints

This study faces limitations related to sample size restrictions and data availability challenges inherent in researching specialized sectors within developing economies. The relatively small number of publicly traded sports companies in Algeria constrains the generalizability of findings and may affect statistical power. Additionally, the

availability of comprehensive financial data for private sports enterprises remains limited, potentially introducing selection bias into the analysis.

Temporal Considerations

The temporal scope of the investigation may not capture longer-term trends and cyclical patterns that could influence the relationship between financial market development and company performance. Economic cycles, policy regime changes, and structural transformations may require extended time series analysis to fully understand their impact on corporate outcomes (Schumpeter, 1942).

Comparative Research Opportunities

Future research should expand the analytical framework to include comparative studies with other North African and emerging market economies. Cross-country analysis can provide valuable insights into regional patterns and identify best practices for financial market development in sports industries. Additionally, qualitative research methodologies, including case studies and executive interviews, could provide deeper understanding of decision-making processes and strategic considerations in financial market engagement (Yin, 2018).

Conclusion

This comprehensive empirical investigation provides robust quantitative evidence of a multifaceted and statistically significant relationship between Algerian financial market dynamics and the operational performance of sports companies within the national economy. Through the application of sophisticated econometric methodologies, including nonlinear regression analysis and rank-order statistical techniques, this research substantiates the critical role that financial market indicators play in determining strategic business outcomes and operational efficiency within the sports industry sector.

The analytical framework employed in this study demonstrates the paramount importance of adopting nonlinear modeling approaches to accurately capture the complex, non-monotonic relationships that characterize the intersection of financial markets and sports enterprise performance. The empirical findings reveal an inverted U-shaped relationship between financial market integration and sports company performance, indicating that while moderate levels of financial market integration yield substantial benefits for sports organizations - including enhanced capital allocation, improved liquidity access, and optimized risk diversification - there

exist threshold levels of integration beyond which diminishing returns and potential adverse effects emerge.

The rank analysis methodology employed in this research further substantiates the existence of significant competitive advantages among sports companies that maintain superior access to financial market resources and infrastructure. These findings suggest that differential financial market access creates heterogeneous performance outcomes, with well-connected firms demonstrating superior operational efficiency and market competitiveness compared to their less financially integrated counterparts.

The implications of these findings extend beyond mere academic interest and provide actionable insights for multiple stakeholder groups. Policymakers should consider implementing regulatory frameworks that facilitate optimal financial market integration while establishing safeguards against excessive market exposure that could compromise the stability and sustainability of sports enterprises. The evidence suggests that targeted policy interventions aimed at improving financial market accessibility for mid-tier sports companies could enhance overall industry competitiveness and economic contribution.

Company owners and corporate executives within the Algerian sports industry should adopt strategic approaches to financial market engagement that recognize the existence of optimal integration levels. The inverted U-shaped relationship identified in this study implies that strategic financial management requires careful calibration of market exposure to maximize benefits while avoiding the potential pitfalls of over-integration, including increased vulnerability to market volatility and excessive financial risk exposure.

Financial institutions and investment organizations should consider these nuanced relationships when developing products and services tailored to the sports industry sector. The empirical evidence suggests that differentiated financial solutions, designed to maintain companies within the optimal integration range, may yield superior risk-adjusted returns while supporting sustainable industry growth.

Furthermore, these findings contribute to the broader literature on financial market efficiency and industry-specific performance optimization, particularly within emerging market contexts. The demonstration that nonlinear relationships predominate in the Algerian sports-financial market nexus suggests that traditional linear analytical approaches may inadequately capture the complexity of modern economic relationships, particularly in developing economy contexts where institutional frameworks and market structures continue to evolve.

The research also highlights the critical importance of balanced financial market integration as a strategic imperative for achieving sustainable growth trajectories within the Algerian sports industry. This balance, when combined with comprehensive risk management frameworks and sophisticated financial monitoring systems, emerges as a fundamental determinant of competitive success and long-term organizational viability.

Future research directions should consider longitudinal analysis to examine the temporal stability of these relationships, cross-sectional comparisons with other emerging markets to identify generalizable patterns, and investigation of sector-specific moderating factors that may influence the strength and direction of financial market-sports company relationships. Additionally, the integration of qualitative research methodologies could provide deeper insights into the behavioral and strategic decision-making processes that underlie the observed quantitative relationships.

In conclusion, this study advances our understanding of the complex interdependencies between financial market development and industry performance in emerging economies, while providing practical guidance for stakeholders seeking to optimize the benefits of financial market integration within the dynamic and evolving Algerian sports industry landscape.

Conflict of interests:

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author Contributions

Conceptualization, I.L. and S.B.; **Resources**, I.L. and B.T.; **Methodology**, I.L.; **Investigation**, I.L. and S.B.; **Data curation**, I.L.; **Formal Analysis**, I.L. and S.B.; **Writing – original draft**, I.L. and B.T.; **Writing – review & editing**, I.L. *All authors have read and agreed to the published version of the manuscript.*

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