

## Research Article

# Stock Market Listing and Firm Performance in Mozambique: Exploring the Incentive Gap in a Bank-dominated Economy

Ibeawuchi Ibekwe\* , Salim Reginaldo Nhantumbo , Pedkuna Queenta Siliya 

Business School, University of St. Thomas, Maputo, Mozambique

## Abstract

This paper examines the relationship between stock market listing and firm performance, considering whether this association helps to explain the limited participation of firms in Mozambique's stock exchange, the Bolsa de Valores de Moçambique (BVM). Prior studies reveal mixed outcomes. We employed the Related-Sample Wilcoxon Signed Rank Test to compare the median pre-and post-listing ROA of the listed firms. Also, using panel data for Mozambican firms, we estimate hybrid random effects and two step system GMM models to address endogeneity and reverse causality. Results show a consistently statistically nonsignificant relationship between listing status and our measures of performance (ROA and ROE), both within and between firm levels. Moreover, listing does not significantly reduce agency costs, and its effect on leverage is negative at the between-firm level, suggesting listed firms carry lower debt than expected. Control variables, particularly leverage and agency costs, exhibit significant negative effects on firm performance, underscoring financial fragility and governance challenges. Overall, findings indicate that listing on the BVM does not enhance firm performance, helping explain firms' reluctance to list. These results highlight the institutional voids in Mozambique's capital market and suggest that without stronger infrastructure, investor protection, and governance reforms, listing will remain unattractive to most firms.

## Keywords

Mozambique, Stock Market Listing, Firm Performance, Hybrid Model, System GMM, Corporate Governance, Emerging Markets

## 1. Introduction

This paper examines the relationship between stock market listing and firm performance, considering whether this association helps to explain the limited participation of firms in Mozambique's stock exchange, the Bolsa de Valores de Moçambique (BVM). Stock market listing is widely associated with enhanced capital access, governance, and visibility [22, 40, 50, 67, 76]. Yet participation in the BVM remains limited. Since its 1999 launch, only 18 equities have listed,

two have delisted, and just 11 remain on the Official or Second Market, with five on the Third—an average of 0.72 listings every two years, and only 0.52 on primary segments. At its 24th anniversary, the BVM Chairman acknowledged low uptake as a persistent challenge [13].

This challenge reflects Mozambique's broader financial constraints. Access to finance is consistently ranked as the second most critical barrier to business growth, tied with corruption [84]. The

\*Correspondence: Ibeawuchi Ibekwe (ibe.ibekwe@ustm.ac.mz)

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country scores just 25/100 on the World Bank's credit access index, ranking 165th globally [85], with 75.5% of firms credit constrained [49]. In this context, firms would be expected to seek alternative financing, including equity markets. Despite this, most firms remain private even though many meet listing thresholds—16,000,000 MZN for the Official Market and 4,000,000 MZN for the Secondary ( $\approx$ USD 250,000 and USD 62,500). Indeed, 87% of Mozambique's top 100 firms [48] meet these criteria. Reluctance to list often reflects structural barriers, including ownership dilution, onerous disclosure requirements, dependence on alternative financing channels, and limited financial literacy within firms and markets [40, 82]. These concerns raise a central question: does listing actually improve firm performance? If not, firms may rationally avoid it [22, 80].

Globally, the relationship between listing and performance remains contested [74, 80]. Many studies rely on pre–post initial public offering (IPO) designs confined to listed firms [51, 62, 80], excluding unlisted firms as benchmarks and thereby obscuring the effect of listing status itself. This limitation is particularly acute in frontier markets such as Mozambique, where empirical evidence is scarce and policy debates hinge on whether stock market expansion can meaningfully complement banking sector reform.

This study contributes to the literature in three key ways. First, it moves beyond conventional pre–post IPO designs by incorporating both listed and unlisted firms, thereby isolating the effect of listing status more effectively. Second, it combines between-firm comparisons (listed versus unlisted) with within-firm dynamics (pre versus post IPO), strengthening inference through the integration of cross-sectional heterogeneity and longitudinal analysis. Third, by situating the analysis in Mozambique—a frontier market with scarce empirical evidence—the study provides novel insights into capital market development in small exchanges [38] and informs policy trade-offs between stock market expansion and banking reform [79]. In doing so, it advances debates on the role of equity markets in emerging economies [76] and offers evidence-based guidance for strategies to enhance capital market participation.

The paper proceeds as follows: Section 2 reviews the BVM; Section 3 outlines theory and literature; Section 4 details methodology; Section 5 presents results; Section 6 concludes with policy implications and future research directions.

## 2. Overview of the Mozambique Stock Exchange

The Bolsa de Valores de Moçambique (BVM) is a public institution under the Ministry of Finance, created by Decree No. 49/88 and governed by Decree No. 45/07 [14, 15]. Supervised by the Central Bank, its Board of Directors and Supervisory Board are appointed by the Minister of Finance [14]. The exchange lists and trades equity and debt securities, including treasury bonds, corporate bonds, and commercial papers, and is organized into three segments [16]. The Official Market requires equity of 16,000,000 meticais ( $\approx$ USD 250,000), two years of audited accounts, and a float of 15% or 250,000 shares. The Second Market serves small and medium enterprises (SMEs), with a 4,000,000 meticais ( $\approx$ USD 62,500) threshold and nine months of disclosures. The Third Market acts as a preparatory segment for firms not yet meeting full requirements but considered to have listing potential.

Trading on the BVM, governed by Regulation No. 4/GPCABVM/2014 as amended by No. 02/GPCABVM/2018, is conducted through two automated systems: the Call Auction, which matches orders at a single clearing price and the Registration System, which executes pre-negotiated block trades of at least 25,000 units [17, 18]. Trading sessions take place on weekdays from 08:00 to 12:00. In the call auction system, orders may be changed or cancelled up to five minutes before session closes if not executed, with price variation limits of 25% for shares and 20% for debt, and a minimum tick size of 0.01 meticais [17]. In the registration system, block trades allow a maximum variation of 20% from the reference or nominal price [18].

By December 2023, the exchange listed 84 securities: 43 treasury bonds, 16 corporate bonds, nine commercial papers, and 16 equities. Since inception, 18 firms have listed shares, though two later delisted, leaving 16 active—eight on the Official Market, one on the Second, and seven on the Third. By end-2024, 20 brokers and dealers were licensed, including 18 dual-role operators and two brokers only, of which 16 were banks and four non-bank institutions.

Market capitalization rose from USD 2.58 billion in 2022 to USD 2.88 billion in 2023, averaging USD 1.66 billion over the decade (Table 1). Government debt dominates, accounting for 86.6% of capitalization in 2022–2023 and averaging 67.82% from 2014–2023 (Table 2). Equity capitalization fell from USD 0.52 billion in 2014 to USD 0.26 billion in 2023, with its share dropping from 39.73% to 9%.

**Table 1.** Market Capitalization of all Securities Listed on the BVM (2014–2023).

Year	All Securities	Treasury Bonds	Public Funds	Corporate Bonds	Shares	Commercial Paper
2014	1.3186	0.7356	0.0000	0.0000	0.5239	0.0591
2015	1.1741	0.5811	0.1685	0.0000	0.4094	0.0150

Year	All Securities	Treasury Bonds	Public Funds	Corporate Bonds	Shares	Commercial Paper
2016	0.8680	0.3248	0.1146	0.0522	0.3741	0.0022
2017	1.2371	0.5865	0.0929	0.0786	0.4792	0.0000
2018	1.3798	0.7779	0.0449	0.0914	0.4648	0.0008
2019	1.6568	1.0043	0.0000	0.0733	0.5789	0.0002
2020	1.5308	1.1835	0.0000	0.0507	0.2959	0.0007
2021	1.9797	1.6283	0.0000	0.0450	0.3064	0.0000
2022	2.5787	2.2330	0.0000	0.0731	0.2687	0.0039
2023	2.8768	2.4906	0.0000	0.0839	0.2588	0.0434

Source: Authors' calculations based on BVM data. Amounts in USD billion. Exchange rate used for conversion: 64 maticais/USD (FocusEconomics, accessed 23/12/2024).

**Table 2.** Market Capitalization of Securities as a Percentage of Total Market Capitalization (2014–2023).

Security Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Treasury Bonds	55.79%	49.50%	37.42%	47.41%	56.38%	60.62%	77.31%	82.25%	86.59%	86.58%
Public Funds	0.00%	14.35%	13.20%	7.51%	3.26%	0.00%	0.00%	0.00%	0.00%	0.00%
Corporate Bonds	0.00%	0.00%	6.02%	6.35%	6.62%	4.42%	3.31%	2.27%	2.83%	2.92%
Shares	39.73%	34.87%	43.10%	38.73%	33.69%	34.94%	19.33%	15.48%	10.42%	9.00%
Commercial Paper	4.48%	1.28%	0.25%	0.00%	0.06%	0.01%	0.05%	0.00%	0.15%	1.51%

Source: Authors' calculations based on data from BVM.

Transactions grew from USD 0.14 billion in 2014 to USD 0.35 billion in 2023, averaging USD 0.16 billion annually (Table 3). Government debt drove this growth, averaging 92.09% of transaction value (Table 4). Equity trades averaged only

3.40%, peaking at 8.02% in 2019 but falling to 0.24% in 2023. This imbalance suggests the BVM functions more as a government borrowing platform than a private financing mechanism, risking crowding out investment [7].

**Table 3.** Value of Transactions on Securities Listed on the BVM (USD billions).

Security Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
All Securities	0.139	0.316	0.039	0.095	0.054	0.083	0.075	0.189	0.262	0.347
Treasury Bonds	0.135	0.089	0.009	0.042	0.034	0.068	0.065	0.184	0.259	0.339
Public Funds	0.000	0.221	0.025	0.042	0.012	0.001	0.000	0.000	0.000	0.000
Corporate Bonds	0.000	0.000	0.004	0.006	0.004	0.007	0.006	0.004	0.001	0.006
Shares	0.002	0.006	0.001	0.005	0.004	0.007	0.004	0.001	0.001	0.001
Commercial Paper	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001

Source: Authors' calculations based on BVM data. Exchange rate: 64 maticais/USD (FocusEconomics, accessed 23/12/2024).

**Table 4.** Value of Transactions by Security Type as a Percentage of Total Transactions.

Security Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Treasury Bonds	97.50%	28.03%	22.71%	44.19%	64.04%	81.91%	86.87%	97.34%	99.02%	97.67%
Public Funds	0.00%	70.02%	64.41%	44.28%	21.79%	1.10%	0.00%	0.00%	0.00%	0.00%
Corporate Bonds	0.00%	0.00%	9.47%	6.04%	7.16%	8.98%	7.38%	2.34%	0.49%	1.79%
Shares	1.50%	1.84%	3.37%	5.49%	7.01%	8.02%	5.75%	0.32%	0.49%	0.24%
Commercial Paper	1.00%	0.11%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.30%

Source: Authors' calculations based on BVM data.

Scale and liquidity of the BVM remain limited. From 2014–2023, market capitalization averaged 10.44% of gross domestic product (GDP), rising to 13.95% in 2023, but equities averaged just 2.65% (Table 5). Transaction value averaged 0.98% of GDP, with equities contributing only 0.02% (Table 6).

Turnover ratios averaged 9.52% overall, but equity turnover stagnated at 0.23%, falling to 0.03% in 2023 (Table 7). These indicators confirm BVM's shallow equity market and highlight the need for reforms to deepen private sector financing.

**Table 5.** Market Capitalization of BVM Securities as a Percentage of Mozambique's GDP (2014–2023).

Security Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
All Securities	7.75%	8.52%	8.13%	8.65%	9.42%	10.53%	11.55%	11.91%	13.98%	13.95%
Treasury Bonds	4.33%	4.22%	3.04%	4.10%	5.31%	6.38%	8.93%	9.80%	12.10%	12.08%
Public Funds	0.00%	1.22%	1.07%	0.65%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%
Corporate Bonds	0.00%	0.00%	0.49%	0.55%	0.62%	0.47%	0.38%	0.27%	0.40%	0.41%
Shares	3.08%	2.97%	3.51%	3.35%	3.17%	3.68%	2.23%	1.84%	1.46%	1.25%
Commercial Paper	0.35%	0.11%	0.02%	0.00%	0.01%	0.00%	0.01%	0.00%	0.02%	0.21%

Source: Authors' calculations based on data from BVM. GDP data from World Bank's World Development Indicators.

**Table 6.** Value of Transactions on BVM Securities as a Percentage of Mozambique's GDP (2014–2023).

Security Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
All Securities	0.82%	2.29%	0.37%	0.66%	0.37%	0.53%	0.56%	1.14%	1.42%	1.68%
Treasury Bonds	0.80%	0.64%	0.08%	0.29%	0.23%	0.43%	0.49%	1.11%	1.40%	1.64%
Public Funds	0.00%	1.61%	0.24%	0.29%	0.08%	0.01%	0.00%	0.00%	0.00%	0.00%
Corporate Bonds	0.00%	0.00%	0.03%	0.04%	0.03%	0.05%	0.04%	0.03%	0.01%	0.03%
Shares	0.01%	0.04%	0.01%	0.04%	0.03%	0.04%	0.03%	0.00%	0.01%	0.004%
Commercial Paper	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%

Source: Authors' calculations based on data from BVM. GDP data from World Bank's World Development Indicators.

**Table 7.** Turnover Ratio of BVM Securities (Value Traded as a Percentage of Market Capitalization, 2014–2023).

Security Type	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
All Securities	10.54%	26.92%	4.50%	7.69%	3.88%	4.99%	4.88%	9.56%	10.15%	12.07%
Treasury Bonds	10.27%	7.55%	1.02%	3.40%	2.48%	4.09%	4.24%	9.31%	10.05%	11.79%
Public Funds	0.00%	18.85%	2.90%	3.41%	0.84%	0.05%	0.00%	0.00%	0.00%	0.00%
Corporate Bonds	0.00%	0.00%	0.43%	0.46%	0.28%	0.45%	0.36%	0.22%	0.05%	0.22%
Shares	0.16%	0.49%	0.15%	0.42%	0.27%	0.40%	0.28%	0.03%	0.05%	0.03%
Commercial Paper	0.11%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%

Source: Authors' calculations based on data from BVM

Comparisons with other Southern African Development Community (SADC) exchanges (Table 8) further underscore the BVM's underdevelopment in capitalization, transaction value, and turnover, particularly its equity segment. Mozambique's equity

market lags regional peers on all indicators. In 2022, equity capitalization was just 1.46% of GDP, with a turnover ratio of 0.0005%, highlighting its shallow and illiquid nature [38, 40].

**Table 8.** Equity Market Indicators in the SADC Region (2022 and 2018–2022 Average).

Country	Market Cap (USD billions)		Market Cap as% of GDP		Value Traded (USD billions)		Value Traded as% of GDP		Turnover Ratio (%)	
	2022	Avg.	2022	Avg.	2022	Avg.	2022	Avg.	2022	Avg.
Botswana	31.02	9.01	152.67	47.30	0.09	0.13	0.44	0.71	0.29	3.10
Namibia	2.16	2.30	17.18	18.57	0.04	0.05	0.29	0.42	1.66	2.21
South Africa	1,170	1,060	289.13	271.38	234.09	273.14	57.76	70.40	26.69	33.27
Zambia	4.04	3.60	13.84	15.69	0.02	0.03	0.05	0.14	0.38	0.80
Mozambique	0.27	0.38	1.46	2.48	0.0013	0.003	0.0001	0.0002	0.0005	0.0021

Note. Data for all countries except Mozambique are from the World Bank's World Development Indicators. Data for Zambia reflect a three-year average (2020–2022). Mozambique data are authors' calculations based on BVM records. Exchange rates sourced from FocusEconomics (accessed 23/12/2024).

The BVM's equity market is also notably concentrated. From 2014 to 2018, Cervejas de Moçambique (CDM) held about 86.28% of market capitalization. Post-2019, with Hidrocarbonetos de Cahora Bassa (HCB), they accounted for 77.81%. By 2023, CDM alone made up 83.44% of trading value. The limited trading is due to dominant shareholding. Each company on the Official and Second Markets have a dominant shareholder with at least 70% control, reaching 92.5% for HCB. Such shares held for control and seldom traded limit liquidity. Overall, the Mozambique Stock Exchange remains shallow, illiquid, and heavily skewed toward government debt instruments [38, 40]. Equity capitalization has declined steadily, equity transactions are negligible, and turnover ratios confirm limited activity. Despite regulatory frameworks and tax

incentives, the BVM functions primarily as a platform for sovereign borrowing rather than private sector financing, raising concerns about crowding out investment and misalignment with developmental goals [7]. Benchmarking against other SADC exchanges further underscores its underperformance. These structural weaknesses raise doubts about whether listing can deliver the performance gains seen elsewhere, justifying empirical investigation into whether listing on the BVM meaningfully improves firm performance and makes it essential to ground the analysis in theory. Accordingly, the next section draws on the resource-based view, agency theory, and institution-based perspectives to frame how listing might influence firm performance in Mozambique.

### 3. Literature Review

#### 3.1. Theoretical Foundation

Three foundational theories explain the potential benefits and costs of stock exchange listing and its implications for firm performance: the resource-based view [8], agency theory [44], and the institution-based view [69].

The resource-based view (RBV) argues that sustainable competitive advantage depends on valuable, rare, inimitable, and embedded resources [8, 9]. Listing can be seen as a resource-seeking strategy: firms go public to access growth capital, diversify funding, and attract human and financial resources at lower cost [12, 60]. Stock markets broaden exposure to investors, improving capital mobilization [21]. L'é and Vinas [53] show that private firms rely more on bank credit, highlighting the strategic value of listing in capital-constrained settings.

In developing economies such as Mozambique, where financing is limited, listing should theoretically be attractive for resource acquisition [35, 40, 71, 77]. Access to cheaper resources is expected to enhance performance [78].

Agency theory [44] addresses problems from the separation of ownership and control and the mechanisms to mitigate them. Going public can affect firm performance in two ways: (i) listing as a source of agency problems, and (ii) listing as a source of corporate governance.

Listing disperses ownership, increasing agency problems and costs [5, 28, 68]. Increased agency problems from interest misalignment between different shareholders, between shareholders and non-shareholding managers, and free rider problems, may lead to poor or negligible performance [28, 39, 46].

To avoid dispersion and reduce agency problems, original owners often keep ownership concentrated with a small float. Concentration (blockholding) aligns interests and reduces agency costs, especially with foreign blockholders in emerging markets [41], potentially improving performance. Yet concentration limits external funding [36, 57]. To raise capital without ceding much ownership, original owners often issue a small float at inflated prices [32], using 'window-dressed' accounts to attract investors [43]. This practice exploits bullish markets [12] and explains post-IPO underperformance [54]. Weak market infrastructure, as in developing exchanges, or even in developed ones (e.g., Enron), allows such practices to persist.

However, concentration can also foster entrenchment, enabling resource expropriation and poor performance [41]. Outcomes of concentration depend on whether interest alignment (positive) or entrenchment (negative) dominates [4, 43].

Stock exchanges add governance through disclosure, analyst monitoring, and market discipline [1, 20, 30]. This should enhance performance, but only if exchanges have robust systems to enforce compliance. While true for developed exchanges, weaker ones (e.g., BVM) may fail. Even developed markets have missed fraud, as Enron illustrates [56].

The institution-based view emphasizes the role of institutional environments in shaping strategic choices and their outcomes [69]. Listing's impact depends on institutional quality [4, 51]. In strong contexts, legal protections, transparency, and disclosure standards enhance investor confidence, reduce asymmetry, and facilitate price discovery [20, 14]. Exchanges integrated into financial systems provide cheaper capital access [61], improving credibility and performance.

In less developed systems, listing can still diversify funding and reduce capital costs [40, 81]. Firms in underdeveloped credit markets, such as Mozambique, should benefit from improved resource access. Yet institutional voids [45]—weak brokers, analysts, enforcement, and investor protection—limit these gains. Without effective disclosure and monitoring, theoretical advantages may not materialize, and performance improvements remain uncertain.

#### 3.2. Benefits and Costs of Stock Market Listing

Listing offers several benefits. Diversification of financing sources eases constraints and strengthens bargaining power with banks [29, 40, 51, 60, 66, 67, 70, 76, 81]. Pagano et al. [66] found IPOs reduce credit costs. Diversified funding enables high-quality projects, improving performance [29, 33, 51].

Listing also enhances share liquidity, allowing investors to reallocate capital and diversify portfolios [29, 40, 50, 76]. Greater liquidity attracts investors and mobilizes capital. Improved discovery is another benefit. Mandatory disclosures and competitive trading yield more accurate valuations [11, 40, 50]. Transparency reduces information asymmetry and attracts resources [20, 37].

Corporate governance tends to improve post-listing [30]. Firms face stricter disclosure, auditing, and reporting, reducing adverse selection and agency costs [37, 40, 76]. Analyst coverage and investor scrutiny add external governance that helps in attracting international capital [55, 66].

In Mozambique, incentives encourage listing: a 50% corporate tax exemption, reduced dividend tax (10% vs. 20% for unlisted firms), and exemption from stamp duties on BVM-traded securities [40]. These measures aim to stimulate market development and improve performance.

While listing offers benefits, it also entails costs that may offset them. These include loss of ownership control, heightened agency problems from dispersed shareholding, and increased managerial accountability to external stakeholders [2, 6, 12, 51, 67]. Firms also face direct costs such as underwriting fees, legal services, listing charges, and ongoing compliance [23, 40]. In Mozambique, companies pay a listing fee of 0.05% of nominal share value and annual maintenance fees of 0.01% for capital up to 100,000 meticais (USD 1,563) or 0.008% above that threshold [19].

These fixed costs weigh heavily on small firms. Hearn and Piesse [38] note that listing costs in small, illiquid markets like Mozambique discourage participation [see also 76]. In Ghana, disclosure requirements deter firms from listing [2]. In the

U.S., the Sarbanes-Oxley Act raised compliance costs after corporate scandals, contributing to declining IPO activity [23, 34].

Implicit costs also arise. Security underpricing reflects information asymmetry between insiders and investors [64]. The “two-audiences” problem occurs when disclosures reduce adverse selection but expose proprietary information to competitors [3, 25, 26, 40]. Public firms may also face short-term market pressures that divert managerial focus from long-term value creation [6, 24].

Empirical evidence shows net benefits vary across time and context. Doidge et al. [22] explain the U.S. “listing gap”—the decline in listed firms since 1996—as rising costs relative to benefits. Lamont [50] similarly attributes declining listings to cost escalation. Ewens and Farre-Mensa [24] show deregulation expanded private capital access, reducing reliance on public markets. In developed economies with abundant private equity and low interest rates, declining listings are understandable. In Mozambique, however, where interest rates exceed 20% and private equity is nascent, reluctance to list is more puzzling. As private equity matures and regulation liberalizes, firms may further delay IPOs, complicating the BVM’s efforts to attract listings [24].

### 3.3. Empirical Evidence on Listing and Performance

Because listing entails both benefits and costs, its impact on performance is ambiguous. Outcomes depend on which side dominates [50, 75, 80]. If costs outweigh benefits, listed firms underperform unlisted peers and show weaker post-listing results. If benefits prevail, listed firms outperform and improve after IPO [50, 80]. Firms must weigh advantages against costs to make value-enhancing decisions [12, 24].

Empirical studies reflect this duality. Some report positive effects [11, 51, 52, 59, 62, 63], while others find deterioration [4, 43, 66]. Some detect no significant relationship [80, 86].

Variability suggests performance effects depend on firm-specific and contextual factors such as size, age, managerial ownership, industry, market conditions, and governance [67]. Several mechanisms explain underperformance. Asker et al. [6] find listed firms invest less and respond less to opportunities. Ueda et al. [81] reports lower marginal product of capital. Gao et al. [31] show listed firms hold more cash to avoid frequent market access and disclosure, linked to the “two-audiences” problem [24, 25, 40]. Excess cash, combined with agency problems, may be used inefficiently, reducing performance [2, 12, 51, 67, 83].

The “lack of opportunities” hypothesis suggests firms struggle to sustain pre-IPO growth, leading to decline [43]. Firm characteristics matter: Mikkelsen et al. [58] showed that the post-IPO decline in operating performance observed between 1980 and 1983 was unrelated to managerial ownership, but that the post-IPO variation in operating performance was

significantly explained by firm size and age with larger, established firms performing better post-IPO.

Jain and Kini [43], analyzing 682 U.S. IPOs, found operating performance declined post-listing despite strong sales and capital expenditure growth. Decline correlated negatively with retained ownership, supporting the interest alignment hypothesis. Pagano et al. [66] corroborated this in Italy, showing profitability declines over three years post-IPO. Mikkelsen et al. [58] reinforced the role of ownership and governance.

Evidence of decline also appears in emerging markets. Alanazi et al. [4], studying 16 Saudi IPOs, found significant post-listing performance drops in return on assets (ROA) and return on sales (ROS). Consistent with Jain and Kini [43], Alanazi et al. [4] attributed decline to ownership dispersion. Firms retaining higher insider ownership performed better, and firm age correlated positively with performance, while size did not.

In Vietnam, Nguyen and Duong [65] examined 189 firms listed on the Ho Chi Minh Stock Exchange (2009–2017) and found significant declines in ROA and return on equity (ROE) for two years post-listing, driven by aggressive pre-listing earnings management through discretionary accruals. Vu [83], analyzing 24,557 firm-year observations from 1,622 firms, distinguished between listings with share issuance and pure listings. He found that share issuance negatively affected performance, while pure listings had no significant impact, underscoring the importance of listing structure and motivation.

Other studies report positive outcomes. Larrain et al. [51], using 14,410 firm-year observations across 16 European countries, found IPOs improved performance, especially in financially dependent industries and countries with stronger investor protections. In Tanzania, Mwenda et al. [62] observed significant ROE improvements among 19 listed firms, while Mwenda and Pastory [63] confirmed gains in ROS, ROA, ROE, and liquidity, attributing them to better capital access, transparency, and investor confidence. Intrisano et al. [42] found listed European firms generally more profitable, particularly in technology and healthcare. Bennett et al. [11] showed U.S. listed firms gained productivity through improved capital allocation and discipline, though selection bias may partly explain results.

Mixed evidence also exists. Wu et al. [86] found Chinese banks underperformed overall, despite short-term ROA gains. Tan and Trung [80] reported improved sales but no profitability effects in Vietnam. Park et al. [67] found listing benefited large U.S. banks but harmed smaller ones.

Overall, findings are inconclusive, varying by context, sector, and firm characteristics. No study has examined Mozambique, where high interest rates and weak banking suggest listing could improve capital access and governance. Yet institutional voids at the BVM may limit benefits. Accordingly, this study tests:

- 1) *Hypothesis 1*: No significant difference exists between post- and pre-listing performance of firms on the Mozambique Stock Exchange.

2) *Hypothesis 2*: There is no significant relationship between stock exchange listing and firm performance in

Mozambique.

## 4. Materials and Methods

### 4.1. Data Sources and Sample

**Table 9.** Sectoral Distribution of Firm-Years in the Sample for Multivariate Analysis.

Sectors	No of firm-years	Percent
Agriculture & Fishing	35	5.24
Commerce	117	17.51
Communication	26	3.89
Construction	44	6.59
Energy	57	8.53
Financial services	167	25
Hotel & Tourism	10	1.5
Industry	71	10.63
Services	44	6.59
Transport & Warehousing	97	14.52
Total	668	100

Source: Authors' calculations

We adopt a quantitative, correlational design using data from KPMG 100 Major Companies in Mozambique and annual reports (2015–2021). The sample comprises 668 firm year observations from 117 companies, eight of which are listed on the BVM. Sectoral distribution is presented in Table 9.

### 4.2. Variables

The dependent variable is return on assets (ROA), measured as earnings before taxes over total assets. The key independent variable is listing status (dummy: 0 = unlisted, 1 = listed). Control variables include leverage (liabilities/assets), firm size (log of assets), ownership (0 = majority government, 1 = majority private), number of employees (log of number of employees), and agency cost (operating expenses/sales).

### 4.3. Data Analysis Plan

For Hypothesis 1, we applied the Related Sample Wilcoxon Signed Rank Test to compare pre- and post-listing performance, following Alanazi *et al.* [4]. This nonparametric test avoids assumptions of parametric methods and is suitable for small samples.

For Hypothesis 2, we estimated random effects (RE) models, supplemented by the hybrid model to separate within- and between-firm effects [10, 73]. The baseline specification is:

$$Y_{it} = \beta_W(X_{it} - \bar{X}_i) + \beta_B\bar{X}_i + \mu_i + \varepsilon_{it} \quad (1)$$

Here,  $(\beta_W)$ , captures within-firm changes in the explanatory variable (e.g., moving from unlisted to listed), while  $(\beta_B)$ , reflects between-firm differences. The error terms  $(\mu_i)$  and  $(\varepsilon_{it})$  capture firm-level heterogeneity and idiosyncratic shocks. Estimation was conducted in Stata 15 using the `xthybrid` command. To address endogeneity and reverse causality, we employed two step system GMM estimators with collapsed instruments for robustness.

## 5. Results

### 5.1. Test of Hypothesis 1

To test Hypothesis 1, we employed the Related-Sample Wilcoxon Signed Rank Test to compare the median pre- and post-listing ROA of the listed firms for which we could ascertain their pre-listing records. The results are summarized in

Table 10 for each of the firms.

**Table 10.** Wilcoxon Signed Rank Test Comparing Pre- and Post-Listing ROA.

Statistics	Values					
	EMOSE	CDM	CMH	HCB	ZERO	TOUCH
Median Pre-listing ROA	.01	.14	.21	.13	-.03	.20
Median Post-listing ROA	.05	.14	.33	.20	-.05	.05
Total N	9	3	3	3	3	3
Test Statistic (W)	34	6.00	2.00	3.00	3.00	2.00
Standard Error	8.44	1.87	1.87	1.12	1.12	1.87
Standardized Test Statistic (z)	1.36	1.60	-.54	1.34	-.45	-.54
Asymptotic Significance (2-tailed)	.17	.11	.59	.18	.66	.54
Effect Size (r)	.32	.65	-.22	.55	-.18	-.22

Source. Authors' creation based on Stata output

A Wilcoxon signed-rank test was conducted to compare pre- and post-listing ROA of six companies listed on the BVM. As Table 10 shows, for all the companies we examined, the median of difference between post-listing ROA and pre-listing ROA equals 0 leading us to retain the null hypothesis that there is no significant difference between the post-listing and

pre-listing performance of firms listed on the Mozambique Stock Exchange. For instance, for EMOSE, a Wilcoxon signed-rank test indicated that post-listing ROA ( $Mdn = 5.0\%$ ) was not significantly greater than pre-listing ROA ( $Mdn = 1.0\%$ ),  $z = 1.36$ ,  $p = .17$ ,  $r = .32$ , indicating no median difference in ROA following listing.

## 5.2. Descriptive Statistics and Multicollinearity Test

**Table 11.** Bootstrap Descriptive Statistics.

Variable	N	M	SD	Min	Max	Bootstrap <sup>1</sup> Bca 95% Confidence Interval	
						Lower	Upper
roa	668	0.05	0.19	-1.52	1.95	0.03	0.06
roe	668	0.11	0.56	-4.11	3.02	0.06	0.16
list	668	0.06	0.23	0	1	0.04	0.08
lev	668	0.72	0.47	0.03	5.30	0.69	0.76
fsize	668	14.9	1.91	9.56	19.35	14.76	15.07
er	668	0.87	0.34	0.05	4.16	0.84	0.90
empl	668	5.52	1.52	1.79	9.45	5.40	5.64
own	668	0.13	0.33	0	1	0.10	0.15

Note. 1. Bootstrap results are based on 1000 bootstrap samples; Bca = Bias-corrected and accelerated. *fsize* and *empl* are log-transformed; *list* and *own* are categorical variables, and the means are reported as proportions.

To test Hypothesis 2, we estimated a random effects model to account for the multilevel data structure and mitigate endogeneity.

We employed a hybrid specification, implemented through the xthybrid command in Stata to relax the random effects assumption of zero correlation between level 2 errors and level 1 variables. [Table 11](#) reports the descriptive statistics for all model variables.

[Table 12](#) reports the correlation matrix used to assess multicollinearity. No coefficients approach the 0.80 threshold commonly viewed as indicative of multicollinearity [27, 47].

**Table 12.** Bootstrap Correlation Matrix of the Variables to Test for Multicollinearity.

	roa	list	lev	fsize	er	empl	own
roa	1						
list	.01	1					
lev	-.41***	-.15***	1				
fsize	-.02	-.04	.05	1			
er	-.30***	-.09**	.17***	-.08**	1		
empl	-.02	-.08**	.10***	.52***	.09**	1	
own	-.11***	.23***	.07*	.31***	.08**	.13***	1

Note. Bootstrap results are based on 1000 bootstrap samples and Bias-corrected and accelerated confidence intervals; the correlation between the categorical variables (list and own) was estimated using the point-biserial

\*p <.10; \*\*p <.05; \*\*\*p <.01

[Table 13](#) reports the variance inflation factors (1.06–1.54; mean = 1.24) and tolerance values, all above 0.10, confirming no multicollinearity concerns.

**Table 13.** Tolerance and variance inflation factor (VIF) of predictors.

Variable	VIF	Tolerance
list	1.12	0.894
lev	1.06	0.942
fsize	1.54	0.648
er	1.08	0.925
empl	1.41	0.708
own	1.22	0.820
Mean VIF	1.24	

Source: Authors' calculations based on Stata output

### 5.3. Test of Hypothesis 2

[Table 14](#) reports the hybrid model results for ROA to test Hypothesis 2. Model 1 excludes controls; Models 2–5 add them individually; Model 6 includes all. The W\_ prefix indicates within-firm effects, while B\_ prefix denotes between-firm effects.

**Table 14.** Hypothesis 2: Relationship between Stock Market Listing and ROA.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
W_list	-.02 (.11)	-.03 (.12)	-.02 (.13)	-.02 (.13)	-.04 (.11)	-.04 (.11)
W_lev		-.13 (.08)	-.14* (.07)	-.15** (.08)	-.18*** (.06)	-.18*** (.06)
W_fsize			-.04 (.06)	-.05 (.06)	-.09 (.06)	-.09 (.06)
W_er				-.12** (.06)	-.15*** (.06)	-.15*** (.06)
W_empl					.10** (.05)	-.10 (.05)
R_own						-0.03 (.02)
B_list	.01 (.04)	-.06 (.04)	-.06 (.04)	-0.07* (.04)	-0.07* (.04)	-.05 (.04)
B_lev		-.19*** (.02)	-.19*** (.02)	-.15*** (.02)	-.15*** (.02)	-.15*** (.02)
B_fsize			.002 (.004)	-.001 (.00)	-.002 (.004)	-.001 (.00)
B_er				-.16*** (.04)	-.16*** (.04)	-.15*** (.04)
B_empl					.002 (.01)	.002 (.01)
Constant	.05***(.01)	.19*** (.02)	.17** (.06)	.31*** (.08)	.32*** (.08)	.28*** (.08)
LL	191.56	235.32	238.19	258.19	271.27	272.01
N (Level 2)	117	117	117	117	117	117
N (Level 2)	668	668	668	668	668	668
Var (-cons)	.01***(.00)	.004** (.002)	.004** (.00)	.003* (.00)	.003* (.00)	.003* (.00)
Var (e_roa)	.03***(.01)	.03*** (.01)	.03*** (.01)	.02*** (.01)	.02*** (.01)	.02*** (.01)
Chi2	0.13	83.25***	88.65***	124.63***	127.26***	130.75***
p- val D_Var	ns	ns	ns	ns	ns	ns

Notes. Robust standard errors are in parenthesis.

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

Table 14 shows that listing on the BVM is consistently negative but nonsignificant across all models, both within firm (W\_list) and between firm (B\_list). In Model 1, W\_list ( $b = -.02, p = .82$ ) and B\_list ( $b = .01, p = .75$ ) are nonsignificant. In Model 6, with all control variables, W\_list ( $b = -.04, p = .69$ ) and B\_list ( $b = -.05, p = .17$ ) remain nonsignificant. Accordingly, Hypothesis 2 is accepted: listing on the BVM does not significantly affect firm performance, with a tendency toward reduced performance.

Among control variables, leverage (lev) and agency cost (er) are consistently significant and negative. In Model 6, W\_lev ( $b = -.18, p < .01$ ) and B\_lev ( $b = -.15, p < .01$ ) indicate higher debt reduces profitability. Similarly, W\_er ( $b = -.15, p < .01$ ) and B\_er ( $b = -.15, p < .01$ ) show that rising agency costs erode performance.

Since listing is expected to reduce agency costs and expand borrowing capacity—both linked to stronger performance—we tested whether listing status predicts these variables. Table 15 reports results: Models 1–2 for agency costs (er) and Models 3–4 for leverage (lev). In Models 1–2, listing status shows

no significant relationship with agency costs. For example, in Model 2 with control variables, W\_list ( $b = -.03, p = .75$ ) and B\_list ( $b = -.13, p = .29$ ) are nonsignificant. This indicates that the governance benefits typically associated with listing [30], expected to lower agency costs [20, 66], are not realized in the BVM.

As shown in Models 3 and 4 of Table 15, in the case of leverage, listing status is significant only at the between-firm level. In Model 3, B\_list is negative and significant ( $b = -.38, p < .01$ ), and in Model 4 with controls it remains marginally significant ( $b = -.27, p < .10$ ). This indicates that listed firms carry lower debt than unlisted ones, contrary to expectations that listing should expand borrowing capacity by reducing credit costs [66]. The result may suggest that listing on the BVM does not lower financing costs, or that listed firms hold more cash to avoid disclosure risks—the two-audiences problem [25, 26, 31, 40]. Further research is needed to assess whether listed firms in Mozambique indeed maintain higher cash reserves.

**Table 15.** Relationship between Listing and Agency Cost and Leverage.

Variable	Agency cost (ER)		Leverage (lev)	
	Model 1	Model 2	Model 3	Model 4
W_list	-.02 (.14)	-.03 (.10)	-.06 (.12)	-.07(.08)
W_lev		-.17 (.17)		
W_fsize		-.17** (.08)		-.16* (.09)
W_er				-.23 (.24)
W_empl		.18* (.10)		.17*** (.05)
R_own		.12 (.09)		.03 (.18)
B_list	-.17 (.11)	-.13 (.12)	-.38***(.10)	-0.27* (.14)
B_lev		.25** (.10)		
B_fsize		-.03** (.01)		.03 (.03)
B_er				.66** (.29)
B_empl		.02** (.01)		-.01 (.02)
Constant	.89***(.02)	1.06*** (.23)	.75*** (.04)	-.20 (.53)
LL	-156.22	-113.17	-281.31	-248.19
N (Level 2)	117	117	117	117
N (Level 2)	668	668	668	668
Var (-cons)	.04*** (.01)	.03*** (.01)	.12** (.04)	.10*** (.02)
Var (e_roa)	.07***(.03)	.07*** (.02)	.09** (.05)	.09** (.04)
Chi2	3.27	38.62***	14.78***	49.79***
p- val D_Var	ns	ns	ns	ns

Notes. Robust standard errors are in parenthesis.

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

#### 5.4. Endogeneity Concerns and Robustness Check

The hybrid model addresses endogeneity from omitted variables but not reverse causality between listing and performance. Better-performing firms may self-select into listing rather than listing driving performance [51, 52]. Thus, observed post-listing gains may simply reflect pre-existing strengths in governance, profitability, or growth potential. This issue is particularly salient in Mozambique, where listing is rare and costly, and firms that list may already be exceptional. Consequently, the correlation between listing status and the error term undermines causal inference.

To address these concerns, we employ a two-step system Generalized Method of Moments (GMM) estimator with lagged instruments. Following Roodman [72], we collapsed the GMM instruments across time to reduce proliferation and

ensure robust inference under unobserved heterogeneity, autocorrelation, and endogenous regressors. Results are reported in Table 16—Model 1 (ROA) and Model 2 (ROE).

**Table 16.** Two-step systems generalized method of moments (GMM) estimation of the listing-firm performance relationship.

Variable	Model 1: ROA	Model 2: ROE
	Coef.	Coef.
roa L1.	-.20 (.20)	
roe L1.		-.17 (.14)
list	.23 (.73)	.03 (.44)
fsize	-.07 (.11)	-.03 (.05)
lev	-.22** (.10)	-.03 (.05)

Variable	Model 1: ROA	Model 2: ROE
	Coef.	Coef.
er	-.15 (.09)	-.08 (.07)
empl	.10 (.11)	.08 (.07)
own	-.49 (.74)	-.10 (.26)
constant	.85 (1.44)	.16 (.61)
No. of obs.	540	509
F-statistics	F(7, 116) = 5.84	F(7, 112) = 3.40
Group/instruments	117/31	113/31
AR(2)	0.951	0.125
Hansen statistics	0.361	0.827

Notes. Robust standard errors are in parenthesis.

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

The validity of the instrument set is confirmed by the Hansen test ( $p = 0.361$ ), indicating joint exogeneity, and the Arellano-Bond AR(2) test ( $p = 0.951$ ), which rules out second-order serial correlation. The number of instruments (31) is also below the number of groups (117), supporting robustness.

As shown in Table 16, Model 1, the lagged dependent variable (L.roa) is negative but nonsignificant, suggesting weak mean reversion. Crucially, listing status is not significant in either Model 1 (ROA:  $b = .23$ ,  $p = .73$ ) or Model 2 (ROE:  $b = .03$ ,  $p = .95$ ). This indicates that, after controlling for firm characteristics and addressing endogeneity, stock market listing has no discernible impact on performance—consistent with earlier xhybrid results.

Among controls, leverage (lev) shows a significant negative effect on ROA ( $b = -.22$ ,  $p < .05$ ), reinforcing concerns about financial fragility. High debt levels appear to erode profitability, likely due to interest burdens or inefficient capital allocation. This finding aligns with broader concerns about capital structure in emerging markets, where long-term financing is constrained.

## 6. Discussion, Conclusion, and Implications

### 6.1. Discussion

This study examined whether stock market listing influences firm performance in Mozambique. Using the Related-sample Wilcoxon Signed Rank Test, we found no significant difference between post- and pre-listing performance of BVM firms. Results from both the hybrid model and system GMM confirm that listing status does not significantly affect ROA.

These findings align with Tan and Trung [80] and Wu *et al.* [86], suggesting that listing, under current institutional conditions, offers limited performance advantages. Possible explanations include Mozambique's shallow capital market, low liquidity, and limited investor participation, which constrain benefits such as capital access and governance. Firms may also list for signaling or compliance rather than efficiency. The fact that stock market listing is not associated with significant performance improvement may be the reason firms opt to remain private especially in an environment as Mozambique where stock market listing brings 'unnecessary' visibility and two-audiences problem [40].

Overall, listing alone appears insufficient to drive performance gains. Realizing benefits requires broader reforms to deepen markets, strengthen investor protection, and improve governance. Future research should explore sectoral differences, listing duration, and interactions with financial structure. The unexpected finding that listed firms carry lower debt levels warrants investigation, as it contradicts expectations that listing expands borrowing capacity [66].

Limitations of the study include reliance on KPMG data, few listed firms, and limited pre-listing histories. We also do not have data to operationalize some of the variables that could have been used as control variables, e.g., managerial ownership, blockholding, etc. These are variables that have been shown to be associated with firm performance.

### 6.2. Conclusion and Policy Implications

This study tested whether listing status affects firm performance in Mozambique using Wilcoxon tests, hybrid models, and system GMM. Results consistently show no significant effect of listing on ROA, leading us to fail to reject both hypotheses.

The absence of a performance premium for listed firms may reflect structural weaknesses: low liquidity, limited investor base, and weak governance enforcement, which can dilute the signaling and disciplining effects typically associated with public listing in more developed markets. The negative effect of leverage on ROA highlights firms' vulnerability in underdeveloped debt markets.

Policy implications are clear: encouraging listings alone will not improve performance. Reforms must deepen market infrastructure, strengthen investor protections, and enhance transparency. Regulators should incentivize disclosures, improve governance frameworks, and expand financial literacy. For practitioners, listing should not be seen as a universal remedy; attention should focus on capital structure, ownership, and managerial practices.

Government could stimulate the market by privatizing state-owned firms through the exchange, while the central bank might raise minimum bank capital to encourage listings.

Future research should address data limitations, explore sectoral heterogeneity, governance interactions, and motiva-

tions for listing, including cash-holding behavior of listed versus unlisted firms.

## Abbreviations

BVM	Bolsa de Valores de Moçambique
CDM	Cervejas de Moçambique
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HCB	Hidrocarbonetos de Cahora Bassa
IPO	Initial Public Offering
RBV	Resource-based View
RE	Random Effects
ROA	Return on Assets
ROE	Return on Equity
ROS	Return on Sales
SADC	Southern African Development Community

## Author Contributions

**Ibeawuchi Ibekwe:** Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

**Salim Reginaldo Nhantumbo:** Data curation, Funding acquisition, Investigation, Methodology, Resources, Validation, Writing – review & editing

**Pedkuna Queenta Siliya:** Data curation, Funding acquisition, Investigation, Methodology, Resources, Validation, Writing – review & editing

## Conflicts of Interest

The authors declare no conflicts of interest.

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