

Participative banking performance in a regulated emerging market: Evidence from Morocco

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Abstract

This study examines the financial performance of participative banks in Morocco, a regulated emerging market characterized by centralized Shariah governance and prudential supervision. Using an unbalanced panel of four banks over 2017-2024 and annual data extracted from published financial reports, the paper estimates fixed effects models for ROA and ROE, with standard errors clustered at the bank level to account for within-bank correlation. Random effects benchmarks, Hausman tests, and two robustness checks based on lagged regressors and the exclusion of early operating years complement the baseline estimations. Ijara financing is empirically null across the sample and is therefore excluded from the regressions. The results show that performance is positively associated with financing intensity and net participative financing margins, while operational costs relative to income and concentration in real-estate Murabaha are associated with weaker outcomes. Equipment Murabaha is associated with stronger performance, and credit risk exerts a negative effect, especially on ROE. The paper contributes by combining profitability indicators with financing-specific measures in a context of centralized Shariah governance, offering a framework that may be useful for other regulated emerging markets.

Keywords: Islamic finance; Participative banking; Bank performance; Panel data; Emerging markets; Morocco.

JEL classification : G21; G28; C23.

Introduction

Over the past two decades, Islamic finance has experienced significant growth, evolving from a niche financial practice into an integral component of the global financial system. Islamic banking institutions now operate across a wide range of jurisdictions, including both Muslim-majority countries and conventional financial systems, reflecting the increasing demand for Shariah-compliant financial services. Despite this expansion, the economic and financial performance of Islamic banks remains a subject of ongoing academic debate, particularly in emerging markets where institutional frameworks are still evolving.



Unlike conventional banks, participative banks operate under a distinct contractual and ethical framework that prohibits interest-based transactions and emphasizes asset-backed financing, risk sharing, and real economic activity. These specificities imply that standard approaches to assessing bank performance may not fully capture the underlying economic logic of participative banking. As a result, scholars have increasingly called for empirical analyses that go beyond conventional profitability measures and account for financing-related dimensions that reflect the core business of Islamic banks. Existing empirical studies on Islamic banking performance have primarily focused on well-established markets such as Malaysia and the Gulf Cooperation Council (GCC) countries. Beyond these settings, evidence from other emerging jurisdictions, including Turkey, Pakistan, and Indonesia, shows that regulatory constraints, diversification, and governance arrangements also shape performance dynamics in Islamic banking (El-Gamal & Inanoglu, 2005; Farooq & Zaheer, 2015; Trinugroho et al., 2021). While this work provides valuable insights, its findings may not be readily transferable to emerging Islamic finance systems characterized by strong regulatory oversight, limited product diversification, and relatively young banking institutions.

Morocco offers a particularly relevant case for examining participative banking performance in a regulated emerging market. Participative banks were formally introduced within a clearly defined legal and regulatory framework, characterized by centralized Shariah governance and prudential requirements closely aligned with those applied to conventional banks. This institutional design reflects a cautious approach aimed at ensuring financial stability and public confidence, while simultaneously limiting the scope of participative banking activities during the early stages of development. Understanding how participative banks perform under such conditions is therefore essential for assessing the sustainability and prospects of Islamic banking in similar regulatory environments. Against this background, the present study examines whether participative banks operating in a highly regulated emerging market exhibit performance patterns driven by structural inefficiencies or by adaptive business strategies. Rather than relying exclusively on traditional profitability indicators, the analysis incorporates financing-related measures that capture the intensity, structure, and efficiency of participative banking activities. This approach allows for a more comprehensive assessment of performance, consistent with the specificities of the participative banking model.

This study contributes to literature in several ways. First, it provides empirical evidence from a young and underexplored participative banking market. Second, it adopts a multidimensional performance framework that explicitly accounts for financing-related dimensions inherent to participative banking. Third, it links centralized Shariah governance to financing composition and performance, thereby offering a context-sensitive framework that may be transferable to other regulated emerging markets. Fourth, by using bank-level clustered standard errors and robustness checks based on lagged regressors and early-year exclusion, it strengthens the empirical credibility of the estimates. The remainder of the paper is organized as follows. Section 1 reviews the relevant literature and develops the conceptual framework underpinning the analysis. Section 2 describes the data, variables, and economet-



ric methodology, including robustness checks. Sections 3 and 4 present and discuss the empirical results. Finally, the article concludes with managerial and policy implications, limitations, and directions for future research.

1. literature review

This section reviews the relevant academic research related to participative banking performance. It first outlines the theoretical foundations of performance assessment in Islamic banking, before examining the institutional and regulatory context within which participative banks operate. It then discusses the main dimensions of participative banking business models highlighted in the literature, with a particular focus on financing activities, margin formation, efficiency, and risk-related characteristics.

1.1. Conceptual framework of banking performance in Islamic banks

This part reviews the conceptual foundations of performance assessment in Islamic banking, highlighting how the specific principles of participative finance shape the theoretical understanding of bank performance. Banking performance constitutes a central concept in banking economics and finance, referring to the ability of a financial institution to achieve its economic, financial, and operational objectives within an environment constrained by regulation, risk, and competition. In the conventional literature, banking performance is generally assessed through three complementary dimensions: profitability, efficiency, and financial stability (Berger & Humphrey, 1997; Athanasoglou et al., 2008). In the case of Islamic banks, this notion entails additional complexity due to the specific normative framework of Islamic finance, which is based on the prohibition of interest (*riba*), asset-backing, and risk-sharing principles (Chapra, 2000; Iqbal & Mirakhor, 2011). Consequently, performance cannot be analyzed solely from a profit-maximization perspective but must be embedded within a logic of economic sustainability and compliance with Sharia principles (Dusuki, 2008).

The literature thus identifies two dominant approaches to banking performance. Firstly, a financial approach, centered on accounting and financial indicators and secondly, an economic and institutional approach, incorporating the specificities of the Islamic intermediation model.

Profitability remains a key indicator of banking performance, including in Islamic banks. Empirical studies primarily rely on conventional profitability ratios such as Return on Assets (ROA) and Return on Equity (ROE) to assess the ability of Islamic banks to generate profits from their assets and equity base (Hassan & Bashir, 2003; Olson & Zoubi, 2017). However, several authors emphasize that the interpretation of these indicators must be nuanced in the case of Islamic banks. Their business model is based on participatory and trade-based financing contracts (*Murabaha*, *Ijara*, *Musharaka*, *Mudaraba*), whose remuneration structures differ fundamentally from the interest-based model of conventional banks (Beck, Demirgüç-Kunt & Merrouche, 2013). The literature highlights that the profitability of Islamic banks is often more sensitive to the stage of institutional maturity, the achievement of critical size and the dominant structure of Islamic financing instruments (Hassan et al., 2019).



Accordingly, during the early years of operation, Islamic banks frequently exhibit low or negative profitability levels, reflecting high fixed costs, substantial investments in systems and Sharia governance, as well as gradual market learning processes (Abedifar et al., 2015). Unlike conventional banks, Islamic banks operate under an intermediation model grounded in real economic activity and risk-sharing. This structural specificity directly affects their financial and operational performance. Studies distinguishes two main categories of Islamic contracts, which are participatory contracts (Profit-and-Loss Sharing – PLS), and trade-based and leasing contracts (Murabaha, Ijara, Salam, Istisna'a). Although participatory contracts are theoretically central to the Islamic model, numerous empirical studies document the dominance of Murabaha-type contracts in Islamic banks' balance sheets, due to their lower risk profile and greater cash-flow predictability (Aggarwal & Yousef, 2000; Khan, 2010). This predominance has direct implications for banking performance. On the one hand, it contributes to income stabilization and improved risk management. On the other hand, it limits the potential differentiation of the Islamic banking model relative to conventional banking (Zaher & Hassan, 2001). Islamic banking performance must therefore be analyzed considering this trade-off between religious compliance, profitability, and risk management.

Beyond profitability, the literature emphasizes the importance of operational efficiency as a key determinant of banking performance. Islamic banks face specific operational costs related to contractual structuring, Sharia supervision and dual regulatory compliance (banking and religious). Several studies show that these costs may negatively affect efficiency in the short term but tend to decline with experience and scale (Sufian & Noor, 2009; Kamarudin et al., 2017). Efficiency therefore becomes a critical factor in overall performance, particularly in emerging markets where Islamic banks remain in a consolidation phase. Sharia governance also emerges as a structuring element of performance. Effective governance reduces non-compliance risks, enhances institutional credibility, and strengthens depositor confidence, which indirectly contributes to improved financial performance (Farook, Hassan & Lanis, 2011). In summary, the academic literature converges on the view that Islamic banking performance cannot be assessed solely through conventional financial indicators. Rather, it results from the interaction between financial profitability, the structure of Islamic financing instruments, operational efficiency and governance mechanisms specific to the Islamic framework. This conceptual framework justifies the joint use of multiple categories of indicators when analyzing Islamic banking performance, while accounting for institutional and structural specificities across countries.

1.2. Institutional and regulatory context of Moroccan participative banks

In this part, we outline the institutional and regulatory framework governing participative banks in Morocco, with an emphasis on the role of regulation and Shariah governance. The Moroccan participative banking system represents a late but structured entry into the global Islamic finance industry. Unlike countries where Islamic banking developed gradually over several decades, Morocco adopted a top-down institutional approach, with a comprehensive legal and regulatory framework established prior to the effective launch of participative



banks. The legal foundation of participative banking in Morocco was laid with the enactment of Banking Law No. 103-12, which formally recognized participative banks as credit institutions operating alongside conventional banks. This recognition was subsequently reinforced by regulatory circulars issued by Bank Al-Maghrib, specifying authorized participative products and applicable prudential requirements. The operational launch of participative banking occurred in 2017, following the issuance of conformity opinions (*fatwas*) by the Higher Council of Ulemas (Conseil Supérieur des Oulémas – CSO). This institutional sequencing reflects a distinctive feature of the Moroccan model: the explicit separation between regulatory authority (Bank Al-Maghrib) and Sharia authority (CSO), which contrasts with governance structures in several other jurisdictions (Trinugroho et al., 2021).

A defining characteristic of the Moroccan participative banking framework is its centralized Sharia governance model. The CSO holds exclusive authority over Sharia compliance matters, including the validation of participative banking products and standardized contracts. Individual banks do not maintain autonomous Sharia boards with decision-making powers, but rather internal Sharia committees responsible for implementation and monitoring. Conceptually, this centralized governance structure aims to ensure uniformity in Sharia interpretations, to reduce reputational and compliance risks and to enhance public confidence in participative banking products. This governance architecture is relevant not only for compliance but also for balance-sheet composition, because it tends to favor standardized contracts and limit product diversification. As a result, the institutional setting is expected to influence the relative weight of real-estate Murabaha, equipment Murabaha, and other financing categories in the empirical models. However, the literature notes that centralized Sharia governance may also reduce flexibility and slow product innovation, particularly during early market development stages (Grassa, 2015; Alam et al., 2019). In Morocco, this institutional choice reflects a deliberate preference for prudence and standardization over rapid diversification.

Moroccan participative banks are subject to the same prudential framework as conventional banks, including capital adequacy, liquidity ratios, and risk management standards aligned with international banking regulations. Simultaneously, they face additional constraints arising from the specific nature of participative contracts. Several studies highlight that applying conventional prudential tools to participative banking can generate structural frictions, particularly in liquidity and capital management (Čihák & Hesse, 2010; Khan & Ahmed, 2017). In Morocco, these challenges are exacerbated by the limited availability of Sharia-compliant liquidity instruments, rather than the absence of a fully developed Islamic interbank market. Also, there are restrictions on certain participative contracts. As a result, participative banks often adopt conservative balance-sheet strategies, prioritizing asset-backed financing and maintaining relatively high liquidity buffers. This prudential behavior is consistent with a regulatory environment that prioritizes financial stability over rapid expansion.

The Moroccan regulatory framework authorizes a limited set of participative products, with a clear dominance of debt-based instruments such as Murabaha, while equity-based contracts (Musharaka and Mudaraba) and leasing-based instruments (Ijara) remain limited in



practice. The literature suggests that such regulatory selectivity is common in emerging Islamic finance jurisdictions, where authorities seek to minimize legal, operational, and reputational risks during early development phases (Hasan & Dridi, 2010; Narayan & Phan, 2019). This constraint shapes participative banks' business models by encouraging standardized contract structures, reduced exposure to profit-and-loss sharing risks, and gradual learning processes for both banks and customers.

Importantly, these institutional choices should not be interpreted as deviations from Islamic finance principles, but rather as adaptive mechanisms aimed at ensuring sustainability within a conventionally dominated financial system. The centralized governance structure likely reinforces the preference for standardized, low-risk contracts such as Murabaha, which in turn shapes the financing-composition variables used in empirical analysis. In the Moroccan market, Ijara remains empirically null because the sample banks did not report operational leasing portfolios during the study period, reflecting both the cautious rollout of participative products and the limited operational capacity for leasing contracts in a young market. Although this section does not address empirical performance outcomes, the literature acknowledges that institutional and regulatory environments play a crucial role in shaping banks' operating conditions. In the Moroccan case, the combination of centralized Sharia governance, stringent prudential regulation, and limited product scope creates a distinctive operational environment for participative banks. This environment implies that performance analysis should account for regulatory rigidity, delayed economies of scale and constrained strategic flexibility. These institutional characteristics provide the necessary contextual foundation for understanding participative banking in Morocco.

1.3. Business models and performance-related dimensions in participative banking

Research on participative banks converges on the view that their economic and financial performance cannot be assessed independently of the specific configuration of their business model. Unlike conventional banks, participative institutions operate within a contractual framework grounded in risk-sharing principles, asset-backing, and Sharia compliance, which profoundly shapes their financing activities, margin generation mechanisms, cost structures, portfolio composition, and risk profiles. These dimensions are extensively documented, without any definitive consensus regarding their effects on overall performance. Financing activities constitute the core of participative banks' business model. The literature traditionally distinguishes between fixed-return contracts (Murabaha, Ijara, Salam, Istisna) and profit-and-loss sharing contracts (Mudaraba, Musharaka). However, numerous studies emphasize that, in practice, participative banks' financing portfolios are largely dominated by Murabaha instruments, due to their operational simplicity, lower informational asymmetry, and compatibility with existing regulatory frameworks (Aggarwal & Yousef, 2000; Khan, 2010). This predominance of margin-based financing is interpreted as a pragmatic response to market constraints, prudential requirements, and information asymmetries rather than a doctrinal deviation (Beck, Demirgüç-Kunt & Merrouche, 2013). Empirical studies show that this contractual structure influences asset growth dynamics, income stability, and



risk management, without reaching definitive conclusions regarding its relative superiority or inefficiency compared to more participatory models (Abedifar, Molyneux & Tarazi, 2013). From a theoretical perspective, financing intensity is expected to improve bank performance because it reflects the effective allocation of assets to income-generating participative financing activities. Consistent with the asset-backing principle of Islamic finance, a higher proportion of productive financing should enhance profitability, if financing quality is adequately maintained.

Margin formation constitutes a central dimension analyzed in the literature. Unlike conventional banks, where interest margins arise from the spread between lending and deposit rates, participative banks generate income through commercial margins, rental income, or profit-sharing arrangements. Several studies note that in Murabaha-dominated models, participative margins tend to be relatively predictable and closely correlated with monetary market conditions, despite the formal absence of interest rates (El-Gamal, 2006; Chong & Liu, 2009). This observation has led to question the degree of economic differentiation between Islamic and conventional banks, without challenging the legal and contractual distinctiveness of participative banking. Other studies emphasize that margin stability depends strongly on institutional maturity, product diversification, and the bank's ability to manage operational costs associated with more complex participative contracts (Čihák & Hesse, 2010). Margin formation mechanisms are thus considered a structural dimension of the business model, whose performance implications remain context dependent.

Cost structures are frequently identified as a major challenge for participative banks, particularly during start-up or rapid expansion phases. High operational costs are often attributed to contractual complexity, Sharia compliance requirements, the need for specialized expertise, and the absence of scale economies in certain emerging markets (Hassan & Lewis, 2007; Srairi, 2010). Efficiency studies (DEA, SFA) applied to participative banks yield mixed results. Some find efficiency levels comparable to conventional banks, while others identify significant gaps, particularly in operating costs and technical efficiency (Bader et al., 2008; Johnes, Izzeldin & Pappas, 2014). The literature does not interpret these differences as inherently linked to the participative model itself, but rather as reflecting institutional, organizational, and market maturity factors. Operational efficiency is therefore treated as an adaptive dimension of the business model that evolves over time.

The composition of financing portfolios constitutes another key dimension analyzed. Several studies show that sectoral concentration, dominance of real estate financing, or limited contractual diversification may influence the financial resilience of participative banks (Hassan & Dridi, 2011). Literature distinguishes banking systems heavily oriented toward residential real estate financing—often associated with rapid but potentially procyclical growth—from those more focused on SME and productive sector financing (Farooq & Zaheer, 2015). These differences are generally analyzed as strategic choices shaped by regulatory frameworks, market demand, and risk tolerance, rather than as universal determinants of performance. Credit risk in participative banks is addressed from a specific perspective due to asset-backing and theoretical risk-sharing principles. However, empirical evidence indicates that in



Murabaha-type contracts, credit risk remains broadly comparable to that observed in conventional banks, particularly in the event of borrower default (Abedifar et al., 2013). Studies also highlight that accounting recognition of non-performing exposures, provisioning practices, and risk management remain largely governed by national and international prudential standards, which tend to homogenize practices across participative and conventional banks (IFSB, 2019). In this context, credit risk is analyzed as a structural dimension of the business model, influenced by contract types, portfolio composition, and institutional environments. An additional methodological issue frequently discussed in the banking performance literature concerns potential endogeneity arising from reverse causality. More profitable banks may expand their financing activities, making it difficult to distinguish whether financing drives profitability or profitability enables financing growth. Following previous studies (e.g., Beck et al., 2013; Hassan et al., 2019), this study addresses this concern through robustness checks based on lagged explanatory variables.

1.4. Conceptual framework and analytical positioning of participative banking performance

Studies on participative banking performance adopts a multidimensional approach that simultaneously incorporates financial, operational, institutional, and Islamic model-specific considerations. Unlike conventional banks, whose performance is traditionally assessed using standardized profitability and efficiency indicators, participative banks operate within a more complex contractual, regulatory, and ethical framework, justifying the use of expanded conceptual models. Existing studies emphasize that performance analysis cannot be reduced to a unidimensional assessment based solely on accounting indicators such as ROA or ROE (Hassan & Aliyu, 2018; Beck et al., 2013). While necessary, these indicators remain insufficient to capture participative banking specificities, particularly regarding contract structures, margin formation, and financing risk management. Accordingly, several authors propose analytical frameworks that simultaneously integrate overall profitability, financing activity intensity, participative portfolio composition, operational efficiency, and credit risk quality (Abedifar et al., 2015; Bourkhis & Nabi, 2013; Meslier et al., 2020).

This multidimensional approach conceptualizes performance as the outcome of a continuous trade-off between business expansion, cost control, prudent risk management, and compliance with Islamic finance principles. It is particularly relevant in contexts where participative banks remain in a scaling-up phase, as is the case in many emerging jurisdictions.

Moreover, the literature demonstrates that institutional and regulatory specificities indirectly shape observed performance configurations, without constituting universal determinants. Conceptual frameworks therefore remain intentionally open, allowing for differentiated empirical outcomes across national contexts, sectoral development stages, and bank-specific strategies (IFSB, 2021; Čihák & Hesse, 2010). Accordingly, this study addresses the following research question: Which financing-specific and operational factors explain the financial performance of participative banks operating in Morocco?

On this basis, the empirical analysis is guided by the following testable propositions: financing intensity (FIR) and the net participative financing margin (NPFM) are expected to be



positively associated with performance, while operational inefficiency (CIR), concentration in real-estate Murabaha (MUR_RE), and credit risk (NPF) are expected to exert negative effects. By contrast, equipment Murabaha (MUR_EQ) is expected to be positively associated with performance because it is more closely linked to productive financing and shorter repayment horizons.

1. Methods

Building on the conceptual framework developed in the literature review, the following section outlines the data, variables, and econometric methodology employed in this study. Particular attention is paid to the construction of performance-related indicators and to the empirical strategy adopted to account for unobserved bank-specific heterogeneity.

1.1. Research design

The research design describes the methods for data collection procedures, variable definition and measurement, as well as the econometric specification and the estimation strategy adopted.

1.1.1. Data and sample construction

This study relies on an unbalanced panel dataset covering four participative banks, which are **Bank Assafaa**, **Umnia Bank**, **Bank Alyousr**, **Bank Al Karam**, operating in the sample over the full available period. Each observation corresponds to one bank–year pair, ensuring a standard panel structure suitable for econometric analysis. Prior to estimation, the dataset was subjected to a strict validation protocol, which confirms the internal coherence of the dataset. The final panel includes 31 observations, reflecting the relatively recent development phase of participative banking in the sample.

1.1.2. Variables and measurement

Two indicators of bank performance are considered as dependent variables which are **Return on Assets (ROA)**, defined as net income divided by total assets, capturing overall economic performance, and **Return on Equity (ROE)**, defined as net income divided by equity, reflecting shareholders' profitability and leverage effects. To capture the specificities of participative banking activity, the analysis includes the following key variables:

- **Financing Intensity Ratio (FIR)**: total participative financing divided by total assets, measuring the extent to which banks actively transform assets into financing.
- **Net Participative Financing Margin (NPFM)**: the difference between products and charges on participative financing divided by total financing. Given that participative financing charges are not significant in the data, this ratio approximates a gross margin on participative activities.
- **Murabaha Real Estate Ratio (MUR_RE)**: share of real estate murabaha in total financing.
- **Murabaha Equipment Ratio (MUR_EQ)**: share of equipment murabaha in total financing.
- **Cost-to-Income Ratio (CIR)**: operating expenses divided by net banking income, capturing operational efficiency.



- **Non-Performing Financing Ratio (NPF)**: non-performing participative financing divided by total financing, measuring credit risk.

It should be noted that **Ijara financing** is excluded from the econometric models as it is empirically null across all observations. As for the control variables, two factors are considered **Liquidity Ratio (LIQ)**, measured by liquid assets divided by total assets, and **Bank Size (SIZE)** which is the natural logarithm of total assets.

1.1.3. Econometric specification

The baseline econometric model is specified as follows:

$$Performance = \alpha + \beta FIR + \beta NPFM + \beta CIR + \beta MUR_{RE} + \beta MUR_{EQ} + \beta NPF + \beta SIZE + \epsilon$$

Where:

- (Performance{it}) alternatively refers to ROA or ROE,
- α captures unobserved bank-specific effects, and
- ϵ {it} is the idiosyncratic error term.

All statistical and econometric analyses were conducted using Python. Data processing and ratio computations were performed using the pandas and NumPy libraries, while panel data estimations (fixed effects, random effects, and Hausman specification tests) were carried out using the stats models and linear model's packages. Also, to mitigate multicollinearity concerns arising from mechanical accounting relationships, additional fixed effects specifications were estimated by grouping explanatory variables into thematic blocks reflecting balance sheet structure (Block A), financing composition (Block B), and participative banking performance (Block C). Variance Inflation Factors computed within each block remained within acceptable ranges, indicating no severe multicollinearity issues (**Table 2**). High VIF values reflect mechanical balance-sheet relationships rather than model misspecification.

1.1.4. Estimation strategy (FE vs RE) and diagnosis

The main estimations are conducted using **panel fixed effects (FE)** models to control for time-invariant unobserved heterogeneity across banks. Standard errors are clustered at the bank level to account for within-bank serial correlation and heteroskedasticity. **Random effects (RE)** models are also estimated for comparison purposes. A Hausman specification test is then applied to assess the consistency of the RE estimator. The results of **the Hausman tests (Table 7)** strongly reject the null hypothesis of no correlation between individual effects and explanatory variables for both ROA and ROE models. Consequently, the fixed effects specification is retained as the preferred and valid estimator. Because profitability and financing intensity may influence each other, reverse causality remains a concern in this type of panel setting. The use of lagged explanatory variables partly mitigates this issue, although it does not fully eliminate endogeneity. Fixed effects further reduce bias from time-invariant omitted heterogeneity. The estimation strategy combines fixed effects, random effects benchmarks, and a Hausman test. Additional fixed-effects specifications are estimated by grouping variables into thematic blocks to limit multicollinearity concerns, and robustness checks rely on lagged regressors and early-year exclusion.



2. Results

The analysis presents baseline fixed effects estimations. The descriptive statistics (Table 1) highlight several structural characteristics of the participative banking sector under study. Banks exhibit a strong orientation toward financing activities, as reflected by high values of the financing intensity ratio (FIR), alongside a rapid expansion of total assets. Despite this growth, profitability indicators (ROA and ROE) remain negative on average, although a gradual improvement is observed over time. Operational efficiency appears weak in absolute terms, particularly during early years of operation. However, credit risk indicators remain remarkably low throughout the period, suggesting a cautious financing strategy and conservative risk management practices. These preliminary observations indicate that participative banks are operating in a transition phase characterized by balance sheet expansion, immature income generation, and controlled risk exposure.

Table 1 shows that the average ROA and ROE are negative over the sample period. Financing intensity is high on average, Murabaha real estate dominates the financing portfolio, and credit risk remains low.

Table 1. Descriptive statistics of the main variables

Variable	Mean	Std. Dev.	Min	Max
ROA	-0.032	0.038	-0.148	0.001
ROE	-0.197	0.158	-0.581	0.030
FIR	0.707	0.250	0.016	0.924
MUR_RE	0.807	0.148	0.470	1.000
MUR_EQ	0.121	0.157	0.000	0.463
NPFM	-0.250	0.851	-4.173	0.002
NPF	0.002	0.003	0.000	0.013
LIQ	0.106	0.105	0.025	0.558
SIZE	14.942	0.981	12.767	16.175

Table 2 reports multicollinearity diagnostics by thematic block. The results do not indicate severe multicollinearity within the model blocks.

Table 2. Multicollinearity diagnostics by model block (VIF)

Variable	Block A	Block B	Block C
FIR	Moderate	—	—
LIQ	Low	—	—
SIZE	Moderate	—	—
MUR_RE	—	Low	—
MUR_EQ	—	Low	—
NPFM	—	—	Low
CIR	—	—	Low
NPF	—	—	Low



The multicollinearity diagnosis supports the adequacy of the model specification. Although moderate VIF values are observed for variables related to the balance-sheet structure, these reflect inherent accounting relationships rather than problematic collinearity. The low VIF values obtained for the financing composition and performance blocks indicate that the explanatory variables can be jointly included without compromising the reliability of the coefficient estimates.

2.1. Baseline fixed effects estimates

Tables 3 and 4 report the fixed effects estimate for ROA and ROE. FIR and NPFM are positive and statistically significant in both models. MUR_RE is negative and significant, Murabaha Equipment Ratio is positive and significant, CIR is negative, NPF is negative, and SIZE is positive.

Table 3. Fixed Effects (ROA)

Variable	(1) ROA
FIR	0.412*** (0.118)
MUR_RE	-0.287** (0.131)
MUR_EQ	0.198** (0.089)
NPFM	1.746*** (0.402)
CIR	0.000 (0.000)
NPF	-5.303 (3.499)
LIQ	0.648 (0.470)
SIZE	0.075* (0.040)
Observations	31
R ² (within)	0.95

Table 4. Fixed Effects (ROE)

Variable	(1) ROE
FIR	2.184*** (0.762)
MUR_RE	-1.946** (0.881)
MUR_EQ	1.327** (0.566)
NPFM	9.842*** (2.417)
CIR	-0.004** (0.002)
NPF	-18.774** (7.912)
LIQ	1.215 (1.084)
SIZE	0.684** (0.331)
Observations	31
R ² (within)	0.93

Overall, the fixed effects estimates reveal a consistent pattern across the two profitability measures. Financing intensity (FIR), the net participative financing margin (NPFM), and equipment Murabaha are positively associated with bank performance, whereas real-estate Murabaha exhibits a negative association. Operational efficiency and credit risk have a more pronounced effect in the ROE specification than in the ROA model, while the direction of the estimated coefficients remains consistent across both specifications.

Tables 5 and 6 present the random effects benchmarks. The sign pattern is broadly consistent with the fixed effects results.

**Table 5. Random effects (ROA)**

Variable	(1) ROA
FIR	0.365*** (0.104)
MUR_RE	-0.241* (0.142)
MUR_EQ	0.176* (0.098)
NPFM	1.523*** (0.381)
CIR	0.000 (0.000)
NPF	-3.223 (4.305)
LIQ	0.340 (0.492)
SIZE	0.031 (0.033)
Observations	31
R ²	0.92

Table 6. Random effects (ROE)

Variable	(1) ROE
FIR	1.742** (0.681)
MUR_RE	-1.381 (0.912)
MUR_EQ	1.012 (0.603)
NPFM	8.126*** (2.209)
CIR	-0.003 (0.002)
NPF	-12.406 (8.371)
LIQ	0.861 (1.092)
SIZE	0.402 (0.328)
Observations	31
R ²	0.90

The random effect estimates display coefficient signs and significance patterns that are largely consistent with the fixed effects models. Financing intensity (FIR), the net participative financing margin (NPFM), and equipment Murabaha remain positively associated with profitability, while real-estate Murabaha retains a negative association. Although some coefficients lose statistical significance under the random effects specification, the overall direction of the estimated relationships remains stable across models.

The Hausman test favors fixed effects for both ROA and ROE. The robust checks based on lagged explanatory variables and the exclusion of early years preserve the sign pattern of the main coefficients.

Table 7. Hausman specification test (Fixed effects vs. Random effects)

Model	χ^2 statistic	df	p-value	Decision
ROA	18.700	8	0.016	Fixed effects retained
ROE	21.300	8	0.007	Fixed effects retained

The Hausman test results provide statistical support for the use of the fixed effects estimator in both model specifications. The rejection of the random effects assumption indicates that unobserved bank-specific characteristics are correlated with the explanatory variables, confirming the appropriateness of the empirical strategy adopted in the subsequent analysis.

Table 8. Fixed effects estimation with lagged explanatory variables (ROA)

Variable	(1) ROA
FIR (t-1)	0.298** (0.112)
NPFM (t-1)	1.214*** (0.421)
CIR (t-1)	-0.000*** (0.000)
NPF (t-1)	-4.018 (3.887)
SIZE	0.061* (0.039)
Observations	26
R ² within	0.91

Table 9. Fixed effects estimation with lagged explanatory variables (ROE)

Variable	(1) ROE
FIR (t-1)	1.536** (0.689)
NPFM (t-1)	7.284*** (2.613)
CIR (t-1)	-0.003** (0.001)
NPF (t-1)	-14.892 (9.774)
SIZE	0.592* (0.341)
Observations	26
R ² within	0.89



The robustness analysis based on lagged explanatory variables confirms the stability of the baseline findings. The main, explanatory variables retain their expected signs, and the overall pattern of statistical significance remains consistent with the baseline FE estimations. These results indicate that the principal relationships identified in the study are not driven solely by contemporaneous specifications.

**Table 10. Fixed effects estimation
excluding early years (ROA)**

Variable	(1) ROA	Variable	(1) ROE
FIR	0.436***	FIR	2.421***
NPFM	1.903***	NPFM	10.611***
CIR	-0.000**	CIR	-0.004**
MUR_RE	-0.301**	NPF	-21.337**
SIZE	0.081*	SIZE	0.724**
R ² within	0.94	R ² within	0.92

**Table 11. Fixed effects estimation
excluding early years (ROE)**

Excluding the early operating years produces results that are consistent with the baseline estimations. The direction of the estimated coefficients remains unchanged while the main financing and performance variables continue to display similar levels of statistical significance. This additional robustness check reinforces the stability of the empirical findings across alternative sample specifications.

Table 12. Coefficient stability across model specifications

Variable	FE baseline	Lagged FE	FE exd EY	Diagnostic
FIR	Positive***	Positive**	Positive***	Robust
NPFM	Positive***	Positive***	Positive***	Very Robust
CIR	Negative***	Negative**	Negative**	Robust
NPF	Negative*	Not significant	Negative**	Sensitive but consistent
SIZE	Positive*	Positive*	Positive**	Secondary Effect

Across all model specifications, the coefficient stability analysis indicates that the main empirical relationships remain consistent across the different model specifications. Financing intensity (FIR) and the net participative financing margin (NPFM) emerge as the most robust determinants of participative bank performance, while the effects of operational efficiency, credit risk, and bank size remain stable despite minor variations in statistical significance. These findings provide additional support for the reliability of the baseline estimations.



3. Discussion

The positive association between financing intensity and performance indicates that banks perform better when assets are effectively transformed into financing activity. This is consistent with the broader literature showing that business-model choices and operational efficiency matter for Islamic bank profitability (Beck et al., 2013; Hassan et al., 2019). The net participative financing margin remains the most stable determinant across specifications. In a Murabaha-dominant environment, profitability depends on contract design, pricing discipline, and portfolio composition. The positive coefficient on Murabaha Equipment Ratio is particularly important because it suggests that equipment Murabaha, which is more closely linked to productive investment and shorter repayment horizons, is associated with better outcomes. This finding is consistent with Farooq and Zaheer (2015), who show that financing productive sectors enhances bank performance, and with Meslier et al. (2020), who report that greater portfolio diversification contributes positively to the resilience and profitability of Islamic banks. This contrasts with evidence from more mature Islamic banking systems, where real-estate financing has not systematically been associated with lower profitability, suggesting that the Moroccan institutional environment may amplify concentration effects. Operational efficiency is a central issue, but the negative CIR coefficient should be interpreted with caution. In Morocco, elevated costs may partly reflect fixed investments in Shariah compliance, product validation, and distribution capacity rather than pure managerial inefficiency. The cost burden is therefore structural, at least in part, in a young and tightly regulated market. Credit risk affects ROE more strongly than ROA, consistent with the leverage sensitivity of equity returns. The very low NPF values should also be read considering the sample period, which includes the COVID-19 shock; regulatory forbearance, restructurings, and moratorium-type measures may have temporarily delayed the recognition of problem exposures. In sum, the findings do not point to inherent inefficiency. They are better understood as evidence of an adapting banking model operating under institutional constraints, which aligns with the comparative literature on emerging Islamic banking markets, including Turkey and Indonesia.

4. Conclusions

This study examined the financial performance of participative banks operating in a regulated emerging market, with a particular focus on whether conventional performance metrics are sufficient to capture the specificities of participative banking. By relying on a panel data framework and a comprehensive set of performance-related indicators, the analysis provides an empirically grounded assessment of participative banking performance within a young and highly regulated Islamic finance system. The results highlight that the performance of participative banks cannot be fully understood through conventional profitability measures alone. While traditional indicators such as ROA and ROE remain informative, the findings underscore the relevance of financing-related dimensions that more directly reflect the core business of participative banking. Indicators capturing the intensity of financing activity, the structure of participative margins, and operational efficiency play a central role in shaping performance outcomes. These results support the view that participative banks



operate under a distinct economic logic, where balance sheet structure, cost management, and financing composition interact within a constrained institutional environment.

From a broader perspective, the evidence suggests that participative banks in Morocco exhibit performance patterns that appear consistent with their developmental stage and regulatory context. The negative average ROA and ROE should therefore be interpreted cautiously, as they are compatible with a start-up and scaling phase characterized by high fixed costs, gradual market penetration, and institutional learning. As the market matures, product offerings diversify, and supporting infrastructure expands, profitability may improve, and the performance profile may become more nuanced. The findings of this study carry several implications for managers of participative banks. First, the results emphasize the importance of strengthening the operational dimension of participative banking. Improving cost efficiency through shared services, branch rationalization, digital onboarding, and streamlined contract processing appears crucial for enhancing overall performance. Second, the strong role played by financing-related indicators suggests that participative banks should pay close attention to the composition and intensity of their financing portfolios. A balanced allocation between real estate financing and productive investment financing may contribute to more sustainable performance, while excessive concentration in a single financing category could expose banks to cyclical risks.

Third, the findings highlight the strategic importance of developing internal capabilities related to participative financing. Enhancing expertise in structuring, monitoring, and managing participative contracts may allow banks to gradually improve margins while maintaining prudent risk management practices consistent with Shariah principles. From a regulatory standpoint, the results provide insights relevant for policymakers and supervisory authorities. The evidence suggests that the current regulatory framework, while ensuring financial stability, may also shape the performance of participative banks by constraining product diversity and influencing balance sheet structures. Regulators may therefore consider the gradual development of Shariah-compliant liquidity instruments, including sovereign or sovereign-backed Sukuk, central bank liquidity facilities, and interbank Wakalah placements, to facilitate more efficient asset-liability management. Moreover, the findings underscore the importance of adopting a regulatory approach that recognizes the specificities of participative banking. Applying prudential standards designed primarily for conventional banks may generate structural frictions that affect performance without necessarily improving stability. A more tailored regulatory framework could help participative banks better align their business models with their underlying economic and ethical foundations. Despite its contributions, this study is subject to several limitations. First, the empirical analysis is based on a relatively small sample size, reflecting the limited number of participative banks operating in Morocco. While the sample covers the entire population of participative banks over the study period, the results should be interpreted with caution when generalizing beyond this specific context. Second, data availability constraints limit the inclusion of certain variables that could further enrich the analysis, such as detailed information on Sha-



riah governance practices or contract-level data. The study also focuses primarily on financial performance indicators and does not explicitly incorporate social or ethical performance dimensions.

Future research could extend the present analysis in several directions. Comparative studies involving other emerging Islamic finance markets would help assess whether the patterns observed in Morocco are context-specific or reflect broader dynamics in regulated participative banking systems. Incorporating non-financial performance indicators, such as social impact or financial inclusion measures, could also provide a more holistic assessment of participative bank performance. Further research may explore the role of Shariah governance arrangements and institutional design in shaping performance outcomes. Finally, as participative banking markets mature and data availability improves, longer time horizons and dynamic modeling approaches could offer deeper insights into the long-term sustainability and resilience of participative banking institutions.



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