
**ARE ETHIOPIAN BANKS PRODUCTIVE AND EFFICIENT? AN
APPLICATION OF DEA & MPI ANALYSIS**

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ABSTRACT

This study evaluates the performance of Ethiopian commercial banks using Data Envelopment Analysis (DEA) and the Malmquist Productivity Index (MPI) techniques. DEA results reveal a dual structure in the sector: frontier banks consistently achieved technical and scale efficiency, reflecting resilience to macroeconomic reforms, while others showed persistent scale inefficiencies, with strong input management under VRS but declining CRS scores due to suboptimal operational scale. MPI analysis adds a dynamic view, indicating that some banks improved productivity through better managerial efficiency and technological adoption, whereas others faced declines, particularly after 2020, when external shocks and reform pressures intensified. A group of banks maintained stable MPI values, reflecting consistent operational efficiency. These findings highlight the critical role of scale optimization, extensive use of information technology, and operative management. Policy implications include promoting branch consolidation, encouraging strategic mergers, while strengthening, particularly, Board oversight of underperforming banks to enhance resilience. Overall, the study underscores how managerial capacity, technological adoption, and structural reforms jointly shape the efficiency and productivity of Ethiopian banks, offering evidence-based guidance for both policymakers and banks managers.

Key words: Bank Performance, Data Envelopment Analysis, Malmquist Productivity Index, Technical Efficiency, Scale Efficiency, Ethiopian Commercial Banks, Financial Reforms

I. INTRODUCTION

Bank performance has emerged as widely examined topics in banking research and practice, owing to its central role in financial stability, profitability, and economic development (Alam et al., 2021). Bibliometric evidence confirms a steady rise in publications on this subject over the past five decades (Nguyen et

al., 2021), reflecting the multidimensional nature of performance—spanning from profitability, efficiency, risk management, and regulatory compliance—which collectively determine banks' long-term sustainability and performance (Bouheni et al., 2021).

Performance has remained a key concern for regulators due to its direct link to financial stability. The global financial crisis of 2007–2009 highlighted the significance of profitability and capital adequacy in mitigating systemic risks, intensifying debates in both academic and policy circles (Demirgüç-Kunt et al., 2020). Bank performance also matters for growth, since banks are primary providers of credit, thereby shaping investment and consumption patterns (Rao & Lakew, 2012).

Shareholder view performance as related to their returns through dividends, stock appreciation, and firm value. Prior studies demonstrate that higher returns on equity (ROE) and returns on assets (ROA) enhances shareholder wealth (Athanasoglou et al., 2008). Although not the case in the Ethiopia financial environment, transparency and accountability in reporting are equally important for listed banks where weak performance can erode investor trust, depress share prices, or even trigger bank runs (Olson & Zoubi, 2011; Dietrich & Wanzenried, 2011). Increasingly, environmental, social, and governance (ESG) factors have broadened the scope of performance evaluations, as investors judge sustainable growth and long-term risk management (Cornett et al., 2016).

Techniques such as CAMEL ratings, Basel techniques, Data Envelopment Analysis (DEA), and risk-adjusted performance indicators illustrate the diverse ways of measuring bank performance (Bouheni et al., 2021). Recent shocks—including digital transformation, fintech competition, and the COVID-19 pandemic—have expanded the debate, underscoring the dynamic and evolving nature of performance related researches (Alonso-Conde et al., 2023). Yet, measurement remains complex. Accounting ratios such as ROA and ROE capture profitability but not efficiency or risk, while frontier-based methods like DEA and Stochastic Frontier Analysis (SFA) often yield different results for the same bank, complicating interpretation (Berger & Humphrey, 1997; Fethi & Pasiouras, 2010). These methodological divergences, combined with variations in size, ownership,

and operating environments of banks, explain the lack of consensus on the methods of performance evaluation.

Performance can also be examined at different levels. Whole-bank performance typically emphasizes profitability, capitalization, liquidity, and risk, while branch-level studies focus on operational efficiency and service delivery. Aggregating results across these levels can be misleading, making clarity of focus essential. Based on past researches, DEA has been widely used to assess both bank- and branch-level efficiency, providing benchmarks for management decisions and policy interventions (Schaffnit et al., 1997; Dike, 2021).

Against this background, this study evaluates the performance of Ethiopian commercial banks using first-stage DEA efficiency scores and the Malmquist Productivity Index (MPI). By applying standard input–output specifications, it provides new insights into how Ethiopian banks have operated over the past decade. The remainder of the paper is structured as follows: Section II reviews the literature; Section III outlines the research context, methodology, and data; Section IV presents the results; and Section V concludes with key findings and recommendations.

II. REVIEW OF LITERATURE

General Overview

Bank performance has long been a central theme in financial economics, particularly in advanced economies where robust data availability has supported methodological innovation. In the United States and Europe, researchers have analyzed profitability and efficiency using both traditional accounting ratios and frontier-based techniques, including DEA and SFA. Berger and Humphrey (1997) provided a seminal review emphasizing DEA and SFA as dominant approaches in efficiency measurement. Similarly, Goddard et al. (2004), examining European banks from 1992 to 1998, identified size, capital adequacy, and cost efficiency as key determinants of profitability.

Following the 2008 global financial crisis, researches turned to risk-taking and capital regulation, with studies such as Athanasoglou et al. (2008) and Demirgüç-Kunt & Huizinga (2010) underscoring the impact of macroeconomic shocks and regulatory reforms on profitability. Further, studies in advanced economies

highlight the roles of digitalization, FinTech adoption, and ESG compliance, reflecting the evolving scope of performance research (Dietrich & Wanzenried, 2011; Molyneux et al., 2019). In general, evidence from advanced economies suggests that while capital strength, efficiency, and risk management remain central, technological and regulatory adaptation have become increasingly important.

In developing and emerging economies, interest in bank performance has grown significantly due to the sector's critical role in financial intermediation, stability, and development financing. Banks often dominate financial systems where capital markets remain underdeveloped, making performance vital for economic growth (Demirgüç-Kunt & Levine, 2001). Unlike advanced economies, efficiency in the financial markets is constrained by weak regulation, political instability, and limited access to global finance (Beck et al., 2010). Performance studies reveal substantial heterogeneity: while some banks achieve efficiency gains through reforms and foreign entry, others struggle with high non-performing loans (NPLs), limited innovation, and governance challenges (Berger et al., 2009). Consequently, research in these contexts not only measures efficiency but also reflects broader institutional quality, financial inclusion, and resilience to shocks.

Within Africa, research on bank performance has expanded rapidly, adopting diverse techniques to evaluate profitability and efficiency drivers. Recent evidence highlights efficiency, governance, FinTech integration, and regional disparities as key themes of bank performance. A study of 70 banks across 19 African countries (2009–2020) found higher pure technical efficiency than overall technical efficiency, pointing to scale inefficiencies as the primary challenge (Growing Science, 2024). In addition, governance factors are also central showing that board independence, CEO duality, gender diversity, and committee structures significantly enhance efficiency (Virtus Interpress, 2024). It was further revealed that FinTech adoption has further transformed African banking, with research on 41 banks in 11 countries (2004–2020) indicating both efficiency gains and heightened risk exposure (Preprints.org, 2025).

Further, the European Investment Bank (EIB) African survey, reported that despite asset quality concerns in Kenya, the sector recorded a return on equity of 25%, surpassing regional and Sub-Saharan averages (EIB, 2024). Similarly, Ogola

et al. (2023), analyzing panel data from Ethiopia, Kenya, Rwanda, Tanzania, and Uganda (2014–2022), and found that high non-interest charges undermined the link between banking sector performance and real sector productivity. According to Nnadi & Yahaya (2023), governance remains a persistent concern showing that board diversity and independence significantly shaped performance across 26 African banks.

In summary, these studies underscore the diversity of approaches—from panel regression and SFA to DEA—while also revealing common challenges, particularly data limitations and cross-country comparability. These researches demonstrate that bank performance in Africa is shaped by a complex interplay of efficiency, governance, technological innovation, and macroeconomic restructuring, with implications for policymakers and financial institutions seeking to strengthen resilience and promote sustainable growth.

Bank Performance Research in Ethiopia

Empirical research on the performance of Ethiopian commercial banks has advanced considerably, addressing profitability, efficiency, and emerging determinants from multiple perspectives. Abebaw (2025) provides a comprehensive analysis of profitability drivers using panel data analysis over 2011–2023, identifying both bank-specific and macroeconomic factors. Abdu (2023) assessed operational and financial efficiency, while Asmare (2025) applied multiple-criteria DEA to measure technical efficiency, highlighting variations linked to resource allocation and managerial practices. At the micro level, Tesfaye (2019) emphasized the role of asset quality, capital adequacy, and bank size, whereas Bekele & Wondimu (2021) underscored the influence of non-performing loans, capital structure, and operational efficiency on profitability. Other studies explore various dimensions such as capital structure (Yohannes & Getahun, 2024), financial technology adoption (Ebissa & Lakew, 2025), and electronic banking (Gebremariam, 2024), reflecting the growing importance of innovation and digital transformation. Overall, these studies show an expanded literature in both scope and methodological rigor.

Various techniques have been also adopted in the study of Ethiopian banks. Panel data regression dominates, with Random Effects, Fixed Effects, and Generalized Method of Moments (GMM) widely employed to assess determinants of bank

profitability. For instance, Abebaw (2025) and Yohannes & Getahun (2024) examined using ROA, ROE, and net interest margin (NIM) against variables such as capital adequacy ratio (CAR), NPLs, leverage, operational costs, and macroeconomic indicators (GDP growth, inflation, interest rates). Efficiency studies (e.g., Abdu, 2023; Asmare, 2025) often rely on DEA or SFA, focusing on inputs such as labor, capital, and deposits, and outputs such as loans and interest income. Further, recent studies incorporate FinTech and digital banking as drivers of efficiency and competitiveness (Ebissa & Lakew, 2025; Gebremariam, 2024).

Current research trends show, beyond traditional profitability and efficiency, an integration of structural, technological, and regulatory dimensions. Digitalization and FinTech adoption have emerged as critical determinants of performance, enhancing efficiency and customer outreach in competitive settings (Vives, 2019). Sustainability and ESG considerations are also gaining traction, with studies suggesting long-term stability benefits (Cornett et al., 2016; Weber, 2017). Risk management and capital resilience under Basel III and macroprudential regimes remain central, particularly in balancing profitability with systemic risk stability (Laeven & Levine, 2009; Demirgüç-Kunt et al., 2021).

Disclosure requirements further strengthen that those banks with robust digital infrastructure and diversified revenues were more resilient to shocks (Goodell, 2020). In addition, hybrid approaches that combine non-parametric techniques (DEA) with econometric models are increasingly adopted, capturing efficiency, productivity, and profitability in an integrated framework (Fethi & Pasiouras, 2010). In summary, Ethiopian and global evidence demonstrate that bank performance research is becoming more multidimensional, encompassing financial, technological, regulatory, and sustainability perspectives to reflect the evolving realities of the sector.

III. RESEARCH BACKGROUND, STUDY DESIGN AND METHODOLOGY,

The Ethiopian Banking Sector: An Overview

An overview of the Ethiopian banking sector is provided by the works of Akalu (2024a, 2024b). Although modern banking was first introduced in 1905, the sector remains relatively young: 40% of banks have been established within the past decade, and 81% (25 out of 31) are classified as small banks (NBE, 2024). Despite this relative youth, the sector is expanding rapidly, with total assets reaching 3.409

billion birr (approximately USD 59.3 billion), equivalent to 29.5% of GDP. Deposits and loans are growing at annual rates of 15.4% and 16.1%, respectively, underscoring the sector's dynamism.

According to National Bank of Ethiopia (NBE), as of June 2024, the sector consists of one large bank, five medium-sized banks, and twenty-five small commercial banks (NBE, 2024). Market share remains highly concentrated, with the state-owned Commercial Bank controlling 47.9% of total assets and 47.1% of deposits (NBE, 2024). Digital banking is advancing steadily, driven by customer trust, ease of use, and service quality, which collectively enhance satisfaction and support Ethiopia's gradual transition toward a cash-less economy (Asfaw & Demissie, 2024; Hailu & Eisa, 2025). Nevertheless, challenges persist. Limited infrastructure, regulatory gaps, low digital literacy, fragmented policies, and weak mobile money integration continue to hinder broader financial inclusion (Kennesaw Digital Commons, 2022; Digital Finance Shega, 2024).

Research Objectives

Over the past five years, Ethiopia has undergone significant economic structural transformations. The Home-Grown Economic Reform I and II have affected virtually every sector, targeting macroeconomic stabilization, fiscal consolidation, financial sector liberalization, and improvements to the business environment to attract both domestic and foreign investment. Within the financial sector, these reforms have included liberalization of the foreign exchange market, entry of foreign banks, promotion of financial inclusion, and adoption of modern financial technologies. During this period, commercial banks have played a central role in financing the economy. In light of these profound changes, it is essential to assess whether Ethiopian banks have operated efficiently and sustained productivity in this evolving environment. Accordingly, this study focuses on assessing the performance of commercial banks as its primary research objective.

Data and Sample

According to the NBE (2024), as of June 2024, Ethiopia had 32 domestically owned banks. Among them, the government-owned Development Bank of Ethiopia, a policy bank, accounted for 5% of total banking assets. The sector comprised four fully-fledged interest-free banks and 27 conventional commercial banks, with one state-owned commercial bank being the largest. By June 2024, total deposits

reached nearly 2.5 trillion Birr (approximately USD 18.82 billion), while loans and bonds totaled just under 2.2 trillion Birr (around USD 16.56 billion). Commercial banks' total assets amounted to 3.3 trillion Birr (approximately USD 24.84 billion). The NBE classifies commercial banks into three categories—large, medium, and small—based on asset size, with each category holding distinct shares of industry resources (kindly refer to Table 1).

For this study, 17 banks were selected covering the period 2015–2024. The state-owned commercial bank, representing nearly 50% of the sector's market share and an outlier in market distribution, was included. Additionally, five medium-sized banks and the top eleven banks from the small category were selected based on asset size, following the NBE classification framework. Collectively, these sample banks account for 74% of total capital, 85% of total assets, and 84% of bank branches, making the sample a strong representation of the Ethiopian banking industry.

Methodology

Bank performance can be evaluated using either the production or intermediation approach, reflecting distinct conceptualizations of banking operations. The production approach treats banks primarily as service providers, emphasizing the efficiency of service delivery (Berger & Humphrey, 1997; Wheelock & Wilson, 1999). On the other hand, the intermediation approach views banks as financial intermediaries that transform deposits and other resources into loans and investments. The choice of approach depends on research objectives: the production approach is best suited for operational or branch-level analyses, while the intermediation approach is preferred for assessing overall bank performance and profitability (Abdu, 2023; Athanasoglou et al., 2008; Berger & Humphrey, 1997). Given the focus of this study on bank-level efficiency, the intermediation approach is pursued.

A bibliometric review of 1,308 studies over five decades indicates that the most common analytical techniques in intermediation-based bank research are DEA and the GMM (Alam et al., 2021). DEA, a non-parametric linear programming method, measures the relative efficiency of decision-making units (DMUs) by constructing a “best-practice frontier” from the most efficient units in the sample (Charnes et al., 1978). Scores range from 0 to 1, with 1 indicating that a DMU lies

on the efficiency frontier. DEA accommodates multiple inputs and outputs without assuming a functional form, and by applying Variable Returns to Scale (VRS) and Constant Returns to Scale (CRS) specifications, efficiency can be decomposed into pure technical and scale efficiency.

Despite its advantages, DEA has limitations: it is sensitive to outliers, deterministic (ignoring statistical noise), sample-dependent, and may have limited discriminatory power when inputs and outputs are numerous relative to sample size. Moreover, it assumes commensurability of inputs and outputs, which can be challenging when financial and service outputs coexist (Banker et al., 1984; Charnes et al., 1978). Nonetheless, it remains a dominant method for efficiency analysis and is adopted in this study. Selecting between VRS and CRS is critical: VRS isolates managerial efficiency from scale effects, particularly when banks differ in size, whereas CRS measures overall technical efficiency assuming optimal scale. The best practice in such research is to report both values (Schaffnit et al., 1997; Abdu, 2023). Bank-level DEA studies typically use inputs such as deposits, number of employees, labor costs, total capital, total assets, and branch numbers, while outputs often include loans, interest income, and total income.

In addition, this study employs the Malmquist Productivity Index (MPI) to capture productivity dynamics over time. MPI decomposes productivity change into efficiency change (catching up to the frontier) and technological change (shifts in the frontier), allowing researchers to determine whether improvements result from better resource utilization or technological advancement (Färe et al., 1994). Its non-parametric structure enables comparisons across heterogeneous units without assuming specific production functions, complementing DEA by providing both static efficiency scores and a longitudinal perspective on productivity trends (Berger & Humphrey, 1997; Dong et al., 2012).

Data and Variable Identification

As discussed above, DEA is a non-parametric, linear programming-based technique that requires careful specification of input and output variables. The appropriate identification of these variables is critical to obtaining accurate efficiency measures (Charnes et al., 1978; Banker et al., 1984).

Empirical studies show that common input variables in bank DEA studies include labor, capital, and operating expenses. Labor is typically measured by employee or

staff costs, while capital is represented through indicators such as branch networks, physical assets, or total deposits. Operating expenses are often captured by interest expenses, administrative costs, or overheads. On the output side, the most frequently used variables are loans and advances, revenue, and deposits mobilized. Loans and advances are usually measured by total loans disbursed or the overall credit portfolio; revenue is captured through interest income, non-interest income, or total revenue; and deposits mobilized are represented by total customer deposits.

In this study, the input and output variables have been carefully selected to reflect the operational and financial characteristics of the sampled banks (kindly refer to Table 2). It is worth noting that, in banking DEA studies, the classification of deposits as either an input or an output depends on the adopted conceptual model. As explained above, this paper follows the intermediation approach, which view banks as financial intermediaries that transform deposits into loans and other earning assets. Within this framework, deposits are treated as an input because they represent a resource employed to generate outputs such as loans and revenue. All data, covering the period 2015–2024, for the selected variables are derived from the audited financial statements of the respective banks, thereby ensuring reliability and consistency in the analysis (Joshi et al., 2010; Goh, 2005).

Models

Data Envelopment Analysis can be implemented in multiple stages. In Stage 1, DEA is applied directly to input–output data, producing efficiency scores, reference sets, slacks, and returns-to-scale measures. This stage assumes that all deviations from the frontier result from inefficiency, without controlling for noise or external factors (Charnes et al., 1978; Banker et al., 1984). The extended analysis, Stage 2, is where efficiency scores are regressed on environmental variables (e.g., ownership structure, regulatory conditions) using econometric regression methods. In Stage 3, inputs and outputs are adjusted to control for environmental effects, and efficiency scores are re-estimated to obtain “purified” measures (Fried et al., 1999). Consistent with most bank efficiency studies; this paper limits the analysis to the first-stage DEA only. A profit-oriented approach is applied to analyze bank efficiency. To capture efficiency under alternative scale assumptions, this study estimates two Models: Model 1 (DEA-VRS) and Model 2

(DEA-CRS). The corresponding syntax for implementing the DEA models in STATA is provided (kindly refer to Models 1 and 2).

IV. RESULT AND DISCUSSION

Data Envelopment Analysis

The DEA result of Ethiopian commercial banks from 2015 to 2024 reveals generally high levels of technical efficiency, with a clear dual structure across the sector. Frontier banks—Addis Bank, Awash Bank, Buna Bank, Commercial Bank of Ethiopia, Debub Global Bank, Enat Bank, Hibret Bank, Lion Bank and Zemen Bank—consistently recorded $CRS = VRS \approx 1.000$, reflecting optimal technical and scale efficiency as well as resilience to macroeconomic and regulatory shocks (Berger & Humphrey, 1997; Casu & Molyneux, 2003; Pasiouras, 2008). By contrast, scale-inefficient banks such as Abay Bank, Bank of Abyssinia, Berhan Bank, Dashen Bank, Nib International Bank, Oromia Bank, and Wegagen Bank maintained high VRS scores but reported CRS values below unity, indicating efficient input utilization constrained by suboptimal scale, particularly during periods of structural reform (Fries & Taci, 2005; Färe et al., 1994; Yildirim & Philippatos, 2007). (kindly refer to Table 3).

A comparison between the pre-reform (2015–2019) and reform (2020–2024) periods highlights diverging performance dynamics. During 2015–2019, banks operated close to the efficiency frontier under relatively stable macroeconomic conditions. However, several scale-inefficient banks experienced declining CRS scores during the Homegrown Economic Reform (HGER I & II) era (2019–2024), owing to pressures from foreign exchange liberalization, inflationary shocks, and tighter prudential requirements (EMFA, 2019, 2024). Most frontier banks, in contrast, sustained efficiency levels, underscoring the benefits of diversified operations, digital adoption, and stronger risk management frameworks.

On average across the decade sample period, the sector exhibits a dual structure: a core group of highly efficient frontier banks and a broader set of institutions with persistent scale inefficiencies. This pattern suggests that while managerial efficiency remains strong, structural adjustments are necessary to optimize operational scale and ensure sustained competitiveness in the evolving financial landscape.

Malmquist Productivity Index Analysis

The Malmquist Productivity Index (MPI) extends Data Envelopment Analysis by introducing a dynamic perspective that captures productivity changes over time. Whereas DEA provides a static efficiency assessment, MPI decomposes productivity change into efficiency change and technical (frontier) change, thereby distinguishing improvements driven by managerial performance from those attributable to technological or structural shifts (Färe et al., 1994). When banks differ in size, VRS-based DEA scores are recommended, as they isolate pure technical efficiency from scale effects (Berger & Humphrey, 1997).

MPI analysis of 17 Ethiopian banks from 2015 to 2024 reveals heterogeneous productivity patterns. Abay Bank, Berhan Bank, Dashen Bank, Oromia Bank, and Wegagen Bank recorded overall declines in productivity, reflecting persistent inefficiencies and heightened vulnerability to external shocks (Dong et al., 2012; Casu & Molyneux, 2003). By contrast, Bank of Abyssinia, Commercial Bank of Ethiopia, Cooperative Bank of Oromia, Lion International Bank, Nib International Bank, and Zemen Bank displayed stable productivity with no significant change, suggesting relative resilience. Year-on-year dynamics indicate that productivity remained stable between 2015 and 2019 but became more volatile after 2020, underscoring the sector's sensitivity to macroeconomic reforms and structural adjustments (Ozcan, 2014). Notably, Global Bank, Enat Bank, and Hibret Bank showed consistent improvements in productivity over the study period (kindly refer to Table 4).

Overall, the MPI results point to a mixed performance across the sector. To enhance productivity, banks should invest in technological innovation, strengthen managerial and operational practices, strategically optimize branch and portfolio structures, and build greater resilience to external shocks. At the policy level, measures that promote digital transformation, encourage performance benchmarking, support strategic consolidation, and mitigate macroeconomic disruptions will be critical for sustaining efficiency and fostering a more competitive and resilient banking sector (Berger & Humphrey, 1997; Färe et al., 1994; Dong et al., 2012).

V. CONCLUSION and POLICY IMPLICATION

The integrated DEA and MPI result provide a comprehensive assessment of Ethiopian commercial banks over 2015–2024. DEA results show that while most banks operate with relatively high technical efficiency, scale inefficiencies remain a structural challenge, particularly during periods of macroeconomic reform. Frontier banks consistently maintained both technical and scale efficiency, reflecting resilience and strong managerial capacity, whereas transitional banks displayed persistent misalignments between input utilization and optimal operational scale.

The MPI analysis complements this perspective by capturing productivity dynamics over time. The result indicate that several banks achieved sustained productivity growth, largely through improved managerial efficiency and technological innovation. In contrast, some banks experienced productivity declines, particularly during the 2020–2024 reform period, underscoring vulnerabilities to external shocks and sector-wide adjustments. Banks with relatively stable MPI scores-maintained efficiency without significant productivity gains, illustrating that efficiency alone does not necessarily translate into long-term productivity growth. Collectively, these findings highlight the need to simultaneously address scale inefficiencies and strengthen managerial and technological capabilities to foster sustainable productivity.

From a policy standpoint, several actionable implications emerge. First, scale optimization is essential: banks with CRS scores below unity should pursue operational resizing—through mergers, branch consolidation, or targeted expansion—to achieve economies of scale (Isik & Hassan, 2003). Second, the consistent resilience of frontier banks underscores the importance of digital transformation and service innovation in sustaining efficiency and competitiveness (Pasiouras, 2008). Third, policymakers should carefully sequence reforms to align with institutional capacity, ensuring that regulatory or macroeconomic interventions do not inadvertently exacerbate existing inefficiencies (Barth et al., 2004). Finally, the Home-Grown Economic Reform programs create opportunities for structural transformation through incentivized mergers, cost restructuring, and productivity-enhancing investments, thereby supporting long-term sectoral resilience and competitiveness (Berger et al., 2009).

In sum, the joint DEA–MPI evidence suggests that Ethiopian banks have built a foundation of technical efficiency, but achieving sustained productivity growth will require targeted structural reforms, technological upgrading, and strategic consolidation. These measures provide a roadmap for policymakers and bank managers seeking to enhance efficiency, safeguard productivity, and strengthen the robustness of the banking sector.

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List of Tables

Table 1: Bank Group: Industry share of resources as of June 30, 2024

Group	No	Total Assets %	Total Loans & Bonds %	Total Deposits %	Total Capital %
Large	1	47.9	45.2	47.1	24.2
Medium	5	28.9	31.1	30.3	33.0
Small	25	23.2	23.7	22.6	42.8
Total	31	100.0	100.0	100.0	100.0

Source: NBE-Financial Stability Report, November 2024

Table 2: Selected Input-Output Variables

Input Variables	Output Variables
<ul style="list-style-type: none"> Total Assets Total Deposits Labor Costs No of Branches No of ATMs 	<ul style="list-style-type: none"> Loans & Advances Interest Income Total Income

Source: Author

Table 3: Average Efficiency Results from DEA Analysis

Banks	10Yrs AVERAGE			AVERAGE 2015-2019			AVERAGE 2020-2024		
	CRS	VRS	SCALE	CRS	VRS	SCALE	CRS	VRS	SCALE
Abay Bank	0.971	0.963	0.992	0.989	0.989	1.000	0.955	0.936	0.980
Addis Bank	1.000	1.000	1.000	1.000	1.000	1.000	0.980	0.980	1.000
Awash Bank	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.997	1.000
Bank of Abyssinia	0.967	0.967	1.000	0.972	0.969	0.997	0.965	0.965	1.000
Berhan Bank	0.999	0.999	1.000	0.996	0.996	1.000	1.000	1.000	1.000
Buna Bank	1.000	1.000	1.000	1.000	1.000	1.000	0.997	0.997	1.000
Commercial Bank of Ethiopia	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cooperative Bank of Oromia	1.000	0.900	0.900	1.000	1.000	1.000	1.000	0.800	0.800
Dashen Bank	0.985	0.985	1.000	0.947	0.947	1.000	0.993	0.993	1.000
Debut Global Bank	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Enat Bank	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Hibret Bank	1.000	1.000	1.000	0.999	0.999	1.000	1.000	1.000	1.000
Lion International Bank	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Nib International Bank	0.995	0.995	1.000	1.000	1.000	1.000	0.970	0.970	1.000
Oromia Bank	0.938	0.938	1.000	0.991	0.991	1.000	0.888	0.888	1.000
Wegagen Bank	0.959	0.959	1.000	0.980	0.980	1.000	0.946	0.946	1.000
Zemen Bank	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: Author

Model 1: DEA input (1, 2, 3, ...) = output(1, 2, 3, ...), rts(vrs) ort(out)

Model 1: DEA input (1, 2, 3, ...) = output(1, 2, 3, ...), rts(crs) ort(out)

Where;

rts → Returns to Scale, the DEA assumption about how outputs change with changes in inputs.

Vrs → Variable Returns to Scale, allows efficiency to vary with the size of the decision-making unit, separating pure technical efficiency from scale efficiency.

Crs → Constant Returns to Scale, assumes outputs change proportionally with inputs, so efficiency differences due to scale are not considered.

Ort(out) → Output-oriented DEA (specifies the orientation of the DEA model)

Table 4: Average MPI Results

Bank	Average MPI	Growth Status
Abay Bank	0.979	Decline (<1)
Addis International Bank	1.000	No change (=1)
Awash Bank	1.000	No change (=1)
Berhan Bank	0.999	Decline (<1)
Bank of Abyssinia	1.000	No change (=1)
Buna Bank	1.000	No change (=1)
Commercial Bank of Ethiopia	1.000	No change (=1)
Cooperative Bank of Oromia	1.000	No change (=1)
Dashen Bank	0.960	Decline (<1)
Global Bank	1.035	Growth (>1)
Enat Bank	1.043	Growth (>1)
Hibret Bank	1.001	Growth (>1)
Lion International Bank	1.000	No change (=1)
Nib International Bank	1.000	No change (=1)
Oromia Bank	0.981	Decline (<1)
Wegagen Bank	0.998	Decline (<1)
Zemen Bank	1.000	No change (=1)

Source: Author

Author Profile

Dr. Mehari Mekonnen Akalu is a seasoned finance and investment expert with over two decades of experience spanning corporate strategy, banking, capital markets, academia, and financial consulting. He holds a Ph.D. in Finance & Investment and multiple postgraduate qualifications from Erasmus University and Maastricht School of Management in the Netherlands, along with professional certifications in commercial banking, capital markets, financial planning, financial modeling, and management consulting. In addition to his graduate teaching position, he currently serves as Director of Board Affairs & Corporate Governance at East African Holding SC and holds several prominent board positions, including Chairman and Board Member roles in banking, education, and healthcare institutions. His career includes senior advisory roles in finance and investment, leadership positions at Addis Ababa University, and extensive consultancy work for multinational organizations such as the World Bank, USAID, and DfID-UK. Dr. Mehari is also a professional trainer, specializing in financial advisory, corporate governance, risk management, capital markets, and executive education.

