Domestic Bank Merger and Acquisition in Ethiopia: a prudent strategy for efficiency and synergy gain

Yitbarek Takele Bayiley[1] and Haben Mehari Redae[2]

Article History: Received: 26 January 2022; Revised: 27 August 2022;
Accepted: 29 October 2022

Abstract

Due to the expected Ethiopian government's economic reforms, liberalization, and deregulation initiatives that might follow the country's continued effort to join the WTO, industry shocks and bandwagon effects may trigger merger and acquisition waves in the banking sector. The current study analyzes the potential strategic and technical efficiency gains from potential domestic bank merger and acquisition (M&A) initiatives in Ethiopia. All the seventeen domestic banks operating in the country from 2013-2017 are part of the study. Input-oriented CRS-DEA and Bootstrapped Panel Tobit regression models were employed to analyze the overall scale efficiency gains among 664 hypothetical merger possibilities. Ownership structure and bank size were used to set context variables. The state-owned banks followed by medium, small, and large private banks scored the highest efficiency during the study period. The results indicate large private banks are the preferred banks offering the highest efficiency gains from M&A. Most of the M&A efficiency gains will be outcomes of a learning effect rather than a pure merger signposting little or no resource and service complementarity among merging units. Moreover, only private banks have an opportunity for a full-scale merger. We conclude no clear relationship between bank size and efficiency performance; the scale effect disfavors M&A among merging units, and the internal organizational theory largely explains the potential domestic bank M&A motives.

Keywords: Domestic M&A, CRS, DEA, bank, efficiency
JEL Classification: B21, D61, G21, G28, G34

[1] (Ph.D.), CEO, OVID Venture Capital
Associate Professor of Business Administration
Email: yitbarek.takele@aau.edu.et
[2] Senior Analyst, McKinsey & Company, Inc.
Email: haben.mehari@aau.edu.et

1. Introduction

Mergers and acquisitions have been considered strategic moves since the early writings on corporate strategy (Cartwright et al., 2012). It was subsequently used to pursue growth and renewal strategies towards the end of the 19th century (Kleinert & Klodt, 2002; Junni & Teerikangas, 2019). However, it was abundantly carried out in different forms across industries and regions only in the 20th century (Faulkner et al., 2012).

While strategic and financial aspects of M&A were considered in the 1970s, it was only after the 1980s and 1990s that the human, cultural, and cross-border issues of M&A gained considerable attention (Cartwright, 1998; Faulkner et al., 2012). It was following this that M&A established itself as a dedicated research area in the field of strategic management (Cartwright et al., 2012). However, M&A in emerging markets became popular only in the early 21st century (Kale et al., 2009), though it is especially important to promote economic stability in emerging countries (Du & Sim, 2016).

There is no doubt that a plethora of research has been carried out to explore actual and potential strategic fits and technical efficiency gains in bank mergers & acquisitions. Various studies offer a unique opportunity to learn more and thus, are important considerations in any scientific research undertaking (Zhu et al., 2020). Though there are plenty of studies on mergers and acquisitions in developed and developing countries (Zarei, Alambeigi, Karimi & Zarei, 2015; Wanke, Barros, Azad & Constantino, 2016; Wanke, Maredzab & Gupta, 2017), merger and acquisition practice is still limited in Africa. This problem is also a great issue for Ethiopia. Although there was improved performance in some cases, the extent of the contribution was not significant.

M&A is an intensive activity involving the absorption or combination of the assets and liabilities of two or more companies in which the parties involved share equal or unequal ownership with the primary aim of boosting firm performance (Rhee, 2022; Wanke et al., 2016). It is a popular corporate growth strategy that has hugely influenced the global competitive dynamics and industry structure (Cha, 2020; Hill; Singh & Das, 2018). It remains to be a subject of tremendous interest to both researchers and practitioners alike given the consequence it entails on corporate performance (Sujud & Hachem, 2018; Yaghoubi et al., 2016a; Das & Kapil, 2012).

Different implicit and explicit motives are known to be the causes of the various historical M&As that took place since the end of the nineteenth century (Dieudonne et al., 2014). At least two dominant theoretical accounts are worth mentioning: the internal organizational perspective and the market-oriented perspective (Bogetoft & Wang, 2005). While the internal organizational motives emphasize exploiting economies of scale, economies of scope, and risk-sharing, the market-oriented rationales seek to explain the possibility of gaining market power through strategic alignment.

Regardless of their motive, research on M&A performance indicates about half of the deals fail to produce anticipated results, painting mud on its popularity (Cartwright & Cooper, 1990; Narayanan & Nanda, 2006; Schoenberg, 2006; Junni, & Teerikangas, 2019). Though companies invest more than $2 trillion every year, failure rates are between 70% and 90% (Christensen et al., 2011). Such post-M&A poor performance has made investors leery of M&A as an effective growth strategy.

Given the high rates of merger failure, this study seeks to fill empirical gaps by analyzing the strategic fit and possible profits from mergers and acquisitions of various sizes and ownership configurations. There is an increasingly perplexing situation that M&A failure rates are high. This research attempts to fill such empirical gaps by investigating the strategic fit and gains from potential domestic M&A across different sizes and ownership structures of Ethiopian banks.

Besides the empirical gap, other additional factors set the motivation for this study. First, Ethiopia is expected to liberalize and open up its banking sector to foreign investors in a few years and is set to launch a securities market soon after 2020. These two major policy shifts alone might trigger industry shocks and produce a bandwagon effect. This might consequently result in industry-wide consolidation, financial panics, and bubbles as M&As are both a trigger and a response to change (Öberg & Holtström, 2005). As a result of the potential M&A waves following the anticipated industry shock, Ethiopian banks are expected to engage in M&A activity to maximize shareholder value or hide stumbling performance by combining and judiciously utilizing intangible resources on a broader scale (Kohli & Mann, 2012).

Third, banking in Ethiopia is a sector characterized by mixed features (CEPHEUS, 2019a). The sector is truly competitive and yet is dominated by a state-owned bank. It has also a low financial intermediation level but unexploited

product offerings and growing investor interest. Growing size heterogeneity among private banks is the other important feature that prompted the selection of bank size alongside ownership structure as a context variable of the current study (CEPHEUS, 2019b). For example, throughout the study period, the biggest private bank is as large as six to eight small private banks combined. The current study, therefore, investigates whether strategic fit and technical efficiency gains are opportunities to be exploited by the sector. Therefore, the general research objective of this research was to assess the strategic fit and potential gains from future mergers and acquisitions between Ethiopian banks, and foreign banks.

The study has been organized into five sections. Section II reviews the existing relevant literature. Section III outlines the methods used. Section IV analyses and discusses research findings, Section V concludes the study findings, and Section VII considers policy implications and recommendations.

2. Literature Review

Mergers and acquisitions (M&A) are transactions in which the ownership of companies or their operating units including all associated assets and liabilities are transferred to another entity. M&A is a potent and consequential growth strategy especially when it occurs in waves. It gained significant momentum over time though most were unsuccessful, offering a valuable learning experience for future M&A (Steger & Kummer, 2007). For an M&A activity to be successful, it shall be guided by a value-oriented philosophy augmented with a rigorous potential gain analysis (Idris & Shams, 2018).

Value-oriented M&As have a common goal of achieving synergy gains. Synergy is gained when the value of the combination of two or more firms is greater than the sum of the two or more stand-alone values (Ruback & Jensen, 1983; Bradley et al., 1988; Zhu & Jog, 2012). This can be achieved only when a full merger over and above a technical merger is carried out to maximize pure efficiency gains reflected through economies of scope (harmony effect) and economies of scale (size effect).

Industry shocks among others trigger M&A initiatives as a prospect to gain synergy through increased market share or eliminating excess capacity, improving operational efficiency, and saving on costs (Gort, 1969; Jensen, 1993). Values created following industry shocks may include changes in input prices and supply,

innovations in technology, and currency movements (Mulherin & Boone, 2000; Andrade & Stafford, 2004).

The literature on M&A is extensive and yet largely inconclusive (Nguyen et al., 2012). Nonetheless, any M&A literature review cannot be complete without discussing the waves, motives, and related theoretical underpinnings. Given this, our literature review is mainly geared towards achieving this very objective.

Overview and Motives of Underlying Theories of Merger and Acquisition and Efficiency and Synergy Gains

Several theories, like the efficiency theory of merger, have been used in prior research to explain M&A (Čirjevskis, 2021; Ombaka & Jagongo, 2018), neoclassical theory of M&A (Salma & Hussain, 2020; Rani et al., 2020; Rahman, 2022), behavioral theory (Kimotho, 2018; Barua & Ioanid, 2022) and resource dependency theory (Celtekligil, 2020; Wu et al., 2021).

Many studies have employed efficiency theory and resource dependence theory in the banking industry, in particular RDT (Resource Dependence Theory). According to efficiency theory, mergers are planned and will only occur if they are predicted to create enough realizable synergies to benefit both parties, bidders, and the target. Likewise, several studies Rozen-Bakher (2018), Duan & Jin (2019), and Suk &Wang (2021) emphasize that the primary goal of M&A is to gain synergies (operating and financial synergy). These synergies might take the shape of cost savings or revenue growth. Because of the symmetric expectations of gains, a 'friendly' merger is offered and approved. If the value gain to the target is negative, it is assumed that the target firm's owners will not sell or acquiesce to the purchase. Similarly, if the bidder's owners' gains were negative, the bidder would not finish the transaction.

RDT, on the other hand, is characterized as an explanation of how an organization's external resources, such as skilled workers, money, technology, and raw materials, impact its behavior. According to Purnamawati et al (2022), a business's resources include concrete assets, human assets, and other intangible assets that are used to deliver productive services envisaged by the organization. Furthermore, Pereira et al. (2021) point out that board members contribute to key external resources and can improve a firm's success. Similarly, Winkler & Łukasik (2019) claims that RDT can explain the influence of social activity and organizational changes. RDT provides an outside-oriented view of why a company could purchase or combine with another company.

The quest for growth and the pressure to grow are the primary motivations for M&A, particularly when internal growth strategies are not successful. Fear of losing market power during periods of industry-wide consolidation and bandwagon effect is known to be the popular motivation for most M&A initiatives (Steger & Kummer, 2007).

However, the breadth and variety of motives for firms may have them seeking for M&As are known to be wide and numerous (Calipha et al, 2010). Nonetheless, they may be broadly classified into two groups based on who claims the merger gains: shareholders or managers (Motis, 2007). While shareholders have an economic motive to maximize firm value, managers are victims of agency problems.

M&A motives are an ex-ante phenomenon largely explained by two major theories: the industrial organization and corporate governance theories. In large, the M&A motives may include market power, merger wave, financial distress, market expansion, diversification, misevaluation, pre-emptive motives, tax considerations, internal inefficiencies, agency problems, and technology & strategic asset-seeking among others (Hankir et al., 2011; Motis, 2007; Aurora et al., 2011; Kiymaz & Baker, 2008).

While market power, efficiency gains, and preemptive motives are related to the theory of industrial organization, the correction of internal inefficiencies, agency problems, and capital market imperfections are tied to corporate governance theories (Motis, 2007).

M&A Waves and Theoretical Viewpoints

One of the most conspicuous features of M&A is that they occur in waves (Song & Walkling, 2000; Stearns & Allan, 1996; Otchere & Ip, 2006; Gugler et al., 2012) except few who claim a random character (see Shughart & Tollison, 1984). However, the motivations for M&A waves are among the top ten unsettled mysteries (Park et al., 2010; Brealey & Myers, 1991).

M & A waves influenced global competitiveness, shaped industry structure, and affected consumer & producer welfare. M&A waves are known to have a mixed effect: make one world smaller, another larger, one better & the other worse (Lee, 2013). Moreover, not only do financial panics and bubbles follow M&A waves but also lead to improvements in consumer and producer surpluses.

M&A occur in waves with cyclical patterns starting with periods of numerous M&As followed by fewer mergers (Dieudonne et al., 2014). Said differently, M&A patterns are usually marked by dichotomous variations between high and low activity levels (Town, 1992). M&A waves are, thus, a series of mergers that take place over a decade(s) with the potential to reorganize business sectors clustered in industries through time (Harford, 2005; Jovanovic & Braguinsky, 2004; Cortés et al., 2017; Ching, 2019).

The fact that M&A appears to occur in waves continues to perplex researchers and fuels the interest to search for plausible theoretical explanations that can shed light on this very complex and largely unknown phenomenon (Ribeiro, 2010). Mainly, two competing theoretical views are used to explain the causes of M&A waves: the neoclassical and behavioral views (Shleifer & Vishny, 2003; Arikawa & Miyajima, 2007; Cortés et al., 2017). The neoclassical view makes economic shocks responsible for M&A waves while the behavioral school underscores the effect of managerial behavior and decisions (Ching, 2019). Moreover, while the neoclassical view embraces the industry shock theory and the Q-theory, the behavioral view covers the market timing theory, agency cost theory, and managerial discretion theory.

The pattern and success of M&A activity vary across waves. Despite such differences, most M&A waves were preceded by industrial shocks enjoying rapid credit expansion and stock market booms (Martynova & Renneboog, 2005). This being said, both exogenous and non-strategic factors such as the macroeconomic cycles, and endogenous strategic factors such as resources and capabilities cause cyclical trends (Kastrinaki & Stoneman, 2012). However, there is no clear consensus on what drives merger waves (Ching, 2019). Some of the identified causes for M&A waves in a developed country context include merger manias, government regulation, industry-and-economy-level shocks, market timing, technological changes, and managerial herding (Yaghoubi et al., 2016; Zarei et al., 2015). These factors are believed to be different for developed, developing, and emerging economies and yet remain to be related to the macro, industry, and firm-specific factors of the various contexts (Zarei et al., 2015; Smirnova, 2014; Dikova et al., 2016).

The context matters to claim conclusion validity for both internal and external validities. Ethiopia is set to liberalize and deregulate its financial sectors with the potential to cause industry-and-economy-level shocks. Looking at the

existing literature, this might be a major cause of the M&A wave. This research aims to analyze a strategic fit and the efficiency gains from potential domestic bank M&A.

3. Empirical Approach

Mergers involve two or more firms of roughly the same size while acquisitions involve the fusion of firms of unequal sizes (Lee & Pennings, 1996). Accordingly, in this study, any fusion of DMUs (decision-making units) that falls within a contextual variable is considered a merger while the fusion of DMUs across context variables is considered an acquisition.

Five years of audited financial statements (2013-2017) of all the seventeen domestic banks were used to analyze strategic fit and efficiency gains on potential domestic mergers and acquisitions (M&A). We employed input-oriented data envelopment analysis (DEA) with constant returns to scale and bootstrapped panel Tobit regression methods to analyze efficiency gains and strategic alignment.

Both constant return to scale (CRS) and variable return to scale (VRS) methodologies offer advantages. The CRS provides a reference by constructing the smallest best-practice convex cone that fits the observed data. It also has a faster statistical convergence rate, resulting in a higher efficiency variation, and a greater discriminatory power relative to VRS. Moreover, if VRS is used, DMUs that are very inefficient to the so-called minimum efficient scale may still be deemed perfectly efficient and attain spuriously high-efficiency scores which makes the results misleading (Du, Worthington, & Zelenyuk, 2018). Finally, as reflected in the latest M&A waves, the global banking industry is becoming more deregulated, technology-based, and globalized. This offers all bank types the opportunity to operate under similar conditions and utilize their optimal capacity which is another important precondition to adopting CRS.

The study identified four contextual variables: small, medium, large, and state-owned domestic banks (Table 1). The variables small, medium, and large are proxies to indicate the asset size of private domestic banks. For this purpose, we used a modified tertile where banks with above 75^{th} percentile asset size are set as large, lower than 25^{th} percentile small, and in between medium.

Two approaches are widely used to identify a bank's inputs and outputs: the production and intermediation approach. Under the production approach, banks

are treated as firms producing loans, deposits, and other assets by employing labor and capital. However, under the intermediation approach, banks are considered financial intermediaries that transform deposits, borrowed funds, labor into loans and other assets. Deposits are treated as output and input under the production and intermediation approaches.

Table 1: Context variable performance using input and output variables (USD)

Variable type	Variable name	Contextual variables			
		Small banks	Medium banks	Large banks	State bank
Input	Interest expense	3,998,824	11.2 million	27.5 million	291 million
	Non-interest expense	5,744,977	817 million	37.3 million	265 million
Output	Interest income	7,976,243	31.1 million	67.5 million	888 million
	Non-interest income	6,299,790	16.5 million	32.6 million	236 million

In this research, the intermediation approach is used. We considered interest expenses (costs on deposits and other borrowed funds) and non-interest expenses (cost of converting deposits into loans, including service charges, commissions, general management expenses, salaries, and others) as input variables (Table 1). We also considered interest income (interest on loans and income from the government securities), non-interest income (including commissions and other operating income, and income from service charges on loans and other transactions) as output variables.

The use of interest expenses and interest income as deposit and loan proxies makes the model in line with the intermediation approach that traditionally uses deposits, interest expenses, and non-interest expenses as inputs variable and loans, interest income, and non-interest income as output variables (Gattoufi et al., 2014).

4. Methodology of the Study

Data Source and Collection Instruments

The research uses secondary sources of data obtained from the financial statement of the selected banks. Financial statements of twenty-one banks are collected. These banks are Commercial Bank of Ethiopia (CBE), Abay Bank (AB),

Bank of Abyssinia (BoA), Addis International Bank (Adib), Awash International Bank (AIB), Berhan International Bank (BIB), Bunna International Bank (BBI), Cooperative Bank of Oromia (CBO), Dashen Bank (DB), Debub Global Bank (DGB), Enat Bank (EB), Lion International Bank (LIB), Nib International Bank (NIB), Oromia International Bank (OIB), United Bank (UB), Wegagen Bank (WB) and Zemen Bank (ZB). The data collected is from annual reports of the banks from 2013 to 2017.

Operational Definition of variables / Research Approach/

The production approach and the intermediation approach are two methods that are frequently used to determine the inputs and outputs of a bank. The production model treats banks as a corporation that uses labor and capital to produce loans, deposits, and other assets. The intermediation model, on the other hand, views banks as financial intermediaries that convert labor, purchasing cash, and deposits into loans and other assets. Deposits are particularly considered as inputs under the intermediation approach and output under the production approach. The intermediation strategy is employed in this article. Moreover, interest expenses and non-interest expenses are the two inputs taken into account. Interest expenses cover expenses for deposits and other borrowed funds. These inputs stand in for the price of labor, office supplies, machinery, and money for financing operations, loans, and investments. Interest income and non-interest income are the analysis' two outputs. Loan interest and revenue from government securities are both included in the interest income. Service fees on loans and transactions, commissions, and other operating income are all included in the non-interest income.

Variables Input variables	Operational definitions	Expected sign
Interest expense	It covers the cost of turning deposits into loans, including service fees, commissions, costs associated with general management affairs, wages, and other expenses measured in USD. The costs of labor, administration, equipment, and funds for operations, loans, and investment.	
Non-interest expense	It is the expenses for deposits and other borrowed funds.	
Output variables		
Interest income	The interest income includes interest on loans and income from government securities.	
Non-interest income	The non-interest income includes service charges on loans and transactions, commissions, and other operating income.	
Contextual variable		
Size	A dummy variable designating a small bank that is located at the first quartile (25th percentile) based on their respective asset size.	Based on the result by Strahan, & Weston (1998), Sujud & Hachem (2018) with medium-sized banks, and Ishwarya (2019) with small banks. The expected result is the strategic fit for mergers for small banks is to merge with large banks, medium size banks, large-size

		banks, and state-owned banks.
Msize	A dummy variable designating a medium bank that is located between the third quartile (75th percentile) and first quartile (25th percentile) based on their respective asset size.	Ishwarya (2019) found that small banks had a strategic fit to merge with small banks, medium with medium, and large with large, Chiu et al. (2021) found the strategic fit with medium banks is a large bank. Based on the above justification, the expected result is the strategic fit for mergers for medium banks is to merge with small, large banks, medium size banks, large size banks, and state-owned banks.
Lsize	A dummy variable designating a large bank that is located at the third quartile (75th percentile) based on their respective asset size.	The expected result is the strategic fit for mergers for small banks is to merge with large banks, medium size banks, large-size banks, and state-owned banks. A study by Singh & Das (2018), found that state banks strategically fit with large-size banks whereas Yildirim & Öztürkkal (2022) found with medium size banks, and Jagtiani & Maingi (2018) found with small banks. Therefore, based on the empirical justification, the expected result is the strategic fit for mergers for large banks is to merge with large banks, medium size banks, large-size banks, and state-owned banks.
State	A dummy variable designating the state-owned bank; Commercial Bank of Ethiopia (CBE).	Maharshi (2019) found that the best strategic fit for a state bank was a large size bank, while Singh (2018) found with a small-sized bank and Ishwarya (2019) with a state-owned bank. Therefore, based on the empirical justification the expected result is the strategic fit for mergers for state banks is to merge with a state bank, large banks, medium size banks, large size banks, and state-owned banks.

The DEA Model

We used the input-oriented CRS-DEA model to assess the strategic fit and potential gains from mergers and acquisitions in the Ethiopian banking sector. The merged units are denoted by DMU^J and are found by the direct pooling of inputs and outputs which used $\sum_{j\in J} x^j$ to produce $\sum_{j\in J} y^j$. Therefore, an input-based measure of potential gains from merging becomes

$$E^J = Min\{E \in R_0 | \left(E\left[\sum_{j\in J} x^j\right], \sum_{j\in J} y^j\right) \in T \qquad \textbf{(1)}$$

If E^J < 1, we can save by merging. If E^J > 1, the merger is costly. The corresponding DEA-based operational measure is given below

$$Min\ E^J$$

E^J, λ

s.t. $E^J\left[\sum_{j\in J} x^j\right] \geq \sum_{i\in I} \lambda^j x^i$

$$\left[\sum_{j\in J} y^j\right] \leq \sum_{i\in I} \lambda^j y^i$$

$\lambda \epsilon\ \wedge^k (k)$ **(2)**

Where,

$\wedge^k (crs) = \{\lambda \epsilon\ R_+^K \mid \sum_{k=1}^K \lambda^K free\}$ for Constant Returns to Scale

Decomposing Merger Gains

There are three types of merger gains decomposed from Overall Merger gains (E^J): Technical (learning) efficiency gains (T^J), Harmony (scope) gains (H^J) and Size (scale) gains (S^J). The latter two combined give us pure merger efficiency gains (E^{*J}).

$$E^J = T^J * E^{*J} \text{ and } E^{*J} = H^J * S^J \text{ therefore } E^J = T^J * H^J * S^J \qquad \textbf{(3)}$$

Technical Efficiency Gains

To calculate technical efficiency gains the original units are projected to the production possibility frontier and the projected plans are used as the basis for evaluating the remaining gains from the merger. Thus, x^j, y^j is projected into

$E^j x^j, y^j$ for all j ∈ J, where E^j=$E^{[j]}$ and is the standard efficiency score for the single DMU^j, and the projected plans $(E^j x^j, y^j)$ $j \in J$ is the basis for calculating the pure (adjusted) overall gains from the merger.

$$E^{*J} = Min\{E \in R_0 | \left(E\left[\sum_{j\in J} E^j x^j\right], \sum_{j\in J} y^j\right) \in T \ldots \quad \textbf{(4)}$$

Technical efficiency becomes $T^J = E^J / E^{*J}$ Where $T^J \in [0,1]$

Harmony Effect of Merging

$$H^J = Min\{H \in R_0 | \left(H\left[|J|^{-1} \sum_{j\in J} E^j x^j\right], |J|^{-1} \sum_{j\in J} y^j\right) \in T\} \ldots \quad \textbf{(5)}$$

Where H^J is the harmony effect of merging and |J| is the number of elements in J. The corresponding DEA operation is:

$$Min\ H$$

H, λ

s.t. $H\left[|J|^{-1} \sum_{j\in J} E^j x^j\right] \geq \sum_{i\in I} \lambda^j x^i$

$$\left[|J|^{-1} \sum_{j\in J} y^j\right] \leq \sum_{i\in I} \lambda^j y^i \ldots \quad \textbf{(6)}$$

$$\lambda \epsilon \wedge^k (k)$$

Size Effect of Merger Merging

$$S^J = Min\{S \in R_0 | \left(S\left[H^J \sum_{j\in J} E^j x^j\right], \sum_{j\in J} y^j\right) \in T\} .. \quad \textbf{(7)}$$

The corresponding DEA-based operational measure of the size gains is:

$$Min\ S$$

S, λ

s.t. $S\left[H^J \sum_{j\in J} E^j x^j\right] \geq \sum_{i\in I} \lambda^j x^i$

$$\sum_{j\in J} y^i \leq \sum_{i\in I} \lambda^j y^i \quad \textbf{(8)}$$

$$\lambda \epsilon \wedge^k (k)$$

Where S^J is size effect for bank j.

Bootstrapped Tobit Regression Model

The Tobit model is the most common approach used to investigate if a set of continuous variables may explain the variations in efficiency. Tobit regression is similar to ordinary regression analysis except that the noise term is truncated. It is also widely applied in DEA analysis.

The model for the Tobit regression model is represented as follows

$$E = \begin{cases} az + e, if\ 0 < az + e < 1 \\ 0\ if\ az + e \leq 0 \\ 1\ if\ az + e \geq 1 \end{cases} \quad \textbf{(9)}$$

The probability that E =1 is the probability that az + e ≥ 1. Let F be the probability distribution function for e and f the corresponding density function. Then the probability of E=1 is:

$$pr(E = 1) = pr(az + e \geq 1) = 1 - pr(az + e < 1)$$
$$= 1 - pr(e < 1 - az) = 1 - f(1 - az) \quad \textbf{(10)}$$

And the probability of E=0 is:

$$pr(E = 0) = PR(az + e \leq) = pr(e < -az) = F(-az)$$

In the case wherein 0<E<1 corresponds to E = az + e or e = E - az the density probability function will be f(E-az).

In the Tobit framework, EV is used for the mean or expectation of a random variable to be able to distinguish the mean EV from efficiency E. The conditional expectation consists of three parts corresponding to the three parts of the model for E.

$$EV\left(\frac{E}{Z}\right) = \int EdPr(E|z)$$
$$= \int 0dPr(E = 0\backslash z + \int EdPr(0 < E < 1|z) + \int 1dPr(E = 1|z) =$$
$$\int_{-az}^{1-az} \varepsilon dPr(\varepsilon|z) + 1 - \Pr\,(\varepsilon - az|z) \quad \textbf{(11)}$$

The two probability terms are calculated separately. The last is calculated by assuming the error term is normally distributed i.e, e~N(0, σ2). The first term involves integration. The final result is that.

$$EV(E|Z) = az\left(\emptyset\left(\frac{1-az}{\sigma}\right) - \emptyset\left(\frac{-az}{\sigma}\right)\right) + \sigma\left(\varphi\left(\frac{-az}{\sigma}\right) - \varphi\left(\frac{1-az}{\sigma}\right)\right) + 1 - \emptyset(\frac{1-az}{\sigma}) \quad \textbf{(12)}$$

Based on the above equation

$$EV(E|0 < E < 1, z) = az + \sigma\frac{\varphi\left(\frac{-az}{\sigma}\right) - \varphi(\frac{1-az}{\sigma})}{\emptyset\left(\frac{1-az}{\sigma}\right) - \emptyset(\frac{-az}{\sigma})} = az + \sigma N(az)\ldots \quad \textbf{(13)}$$

And then we have to find the partial derivative of EV(E|z), with respect to z

$$\frac{\partial EV(E|Z)}{\partial Zh} = a_h(\emptyset\left(\frac{1-az}{\sigma}\right) - \emptyset(-\frac{az}{\sigma})\ldots\ldots \quad \textbf{(14)}$$

The term az corresponds to the linear term found for OLS models but here, it is corrected for the probability that 0<E. Residuals of Tobit estimation are often heteroscedastic which causes misleading SEs. Modeling heteroscedasticity in Tobit models is not an easy task and may be arbitrary, scholars cannot simply use a "robust version of their Tobit model, because there is not a Huber-White-type estimator for Tobit models that corrects for heteroscedasticity and serial correlation. However, bootstrapping SEs may solve the issue of heteroscedasticity (Amore & Murtinu, 2019). Bootstrapping treats the obtained data as if that is an accurate reflection of the population, and draws many bootstrapped samples by repeated sampling, with replacement from a pseudo-population consisting of the obtained data. Since the sampling is from the actual data, this is called nonparametric bootstrapping. The assumption here is that the data is a reasonable representation of the population. This paper uses vce(boot) command in STATA to handle bootstrapping with fifty bootstrap replications.

Model specification

Small Banks

$$OME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$PME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$LE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$HE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$

Where

OME_{it}: Overall Merger Efficiency and its decomposition for Small Private Banks under CRS

PME_{it}: Pure Merger Efficiency for Small Private Banks

LE_{it}: Learning or Technical Efficiency for Small Private Banks

HE_{it}: Harmony or Scope Effect for Small Private Banks

Small: Dummy variable indicating the other merged bank as Small Private Bank

Medium: Dummy variable indicating the other merged bank as Medium Private Bank

Large: Dummy Variable indicating the other merged bank Large Private Bank

State: Dummy variable indicating the other merged bank State-Owned Bank

Medium Banks

$$OME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$PME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$LE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$HE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$

Where

OME_{it}: Overall Merger Efficiency for Medium Private Banks

PME_{it}: Pure Merger Efficiency for Medium Private Banks

LE_{it}: Learning or Technical Efficiency for Medium Private Banks

HE_{it}: Harmony or Scope Effect for Medium Private Banks

Small: Dummy variable indicating the other merged bank as Small Private Bank

Medium: Dummy variable indicating the other merged bank as Medium Private Bank

Large: Dummy Variable indicating the other merged bank as Large Private Bank

State: Dummy variable indicating the other merged bank as State-Owned Bank

Large Banks

$$OME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$PME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$LE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$
$$HE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it} + \beta_4 State_{it}$$

Where
OME_{it}: Overall Merger Efficiency for Large Private Banks
PME_{it}: Pure Merger Efficiency for Large Private Banks
LE_{it}: Learning or Technical Efficiency for Large Private Banks
HE_{it}: Harmony or Scope Effect for Large Private Banks
Small: Dummy variable indicating the other merged bank as Small Private Bank
Medium: Dummy variable indicating the other merged bank as Medium Private Bank
Large: Dummy Variable indicating the other merged bank as Large Private Bank
State: Dummy variable indicating the other merged bank as State-Owned Bank

State-owned Bank

$$OME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it}$$
$$PME_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it}$$
$$LE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it}$$
$$HE_{it} = \beta_1 Small_{it} + \beta_2 Medium_{it} + \beta_3 Large_{it}$$

Where
OME_{it}: Overall Merger Efficiency for State-Owned Bank
PME_{it}: Pure Merger Efficiency for State-Owned Bank
LE_{it}: Learning or Technical Efficiency for State-Owned Bank
HE_{it}: Harmony or Scope Effect for State-Owned Bank
Small: Dummy variable indicating the other merged bank as Small Private Bank
Medium: Dummy variable indicating the other merged bank as Medium Private Bank
Large: Dummy Variable indicating the other merged bank as Large Private Bank

5. Results and Discussion

Descriptive Statistics

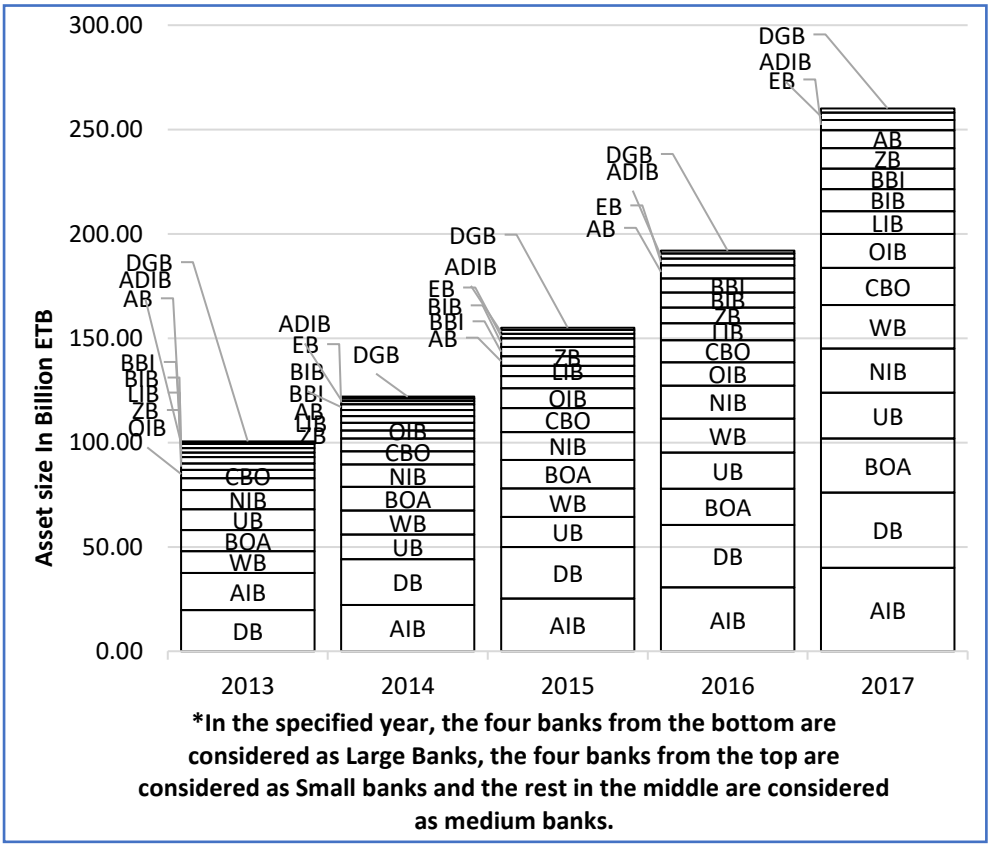
Eighty-four observations across 17 banks (Table 2) are available in the study. Six Hundred Sixty-Four DMUs (Table 3) were also used to analyze the overall, pure, and technical efficiency gains.

Table 2: Bank efficiency score (CRS)

No.	Bank	2013	2014	2015	2016	2017	Average
1	Abay Bank (AB)	0.8246	0.6402	0.7801	0.4393	0.8415	0.7051
2	Bank of Abyssinia (BoA)	0.5586	0.6831	0.6467	0.712	0.8663	0.6933
3	Addis International Bank (AdIB)	0.8742	0.8181	0.9627	0.7683	0.9752	0.8797
4	Awash International Bank (AIB)	0.6181	0.736	0.6516	0.7443	0.9434	0.7387
5	Berhan International Bank (BeIB)	0.8501	0.7266	0.829	1	1	0.8811
6	Buna International Bank (BuIB)	0.817	0.8133	0.8271	0.8232	0.9289	0.8419
7	Commercial Bank of Ethiopia (CBE)	1	1	1	1	1	1
8	Cooperative Bank of Oromia (CBO)	1	1	1	0.9894	1	0.9979
9	Dashen Bank (DB)	0.6035	0.7266	0.8852	0.7667	0.8791	0.7722
10	Debub Global Bank (DGB)	1	0.7659	0.8649	1	1	0.9262
11	Enat Bank (EB)	-	0.7582	0.8324	0.8571	0.8345	0.8206
12	Lion International Bank (LIB)	0.9647	0.7423	1	0.9102	1	0.9234
13	Nib International Bank (NIB)	0.7735	0.8115	0.7922	1	1	0.8754
14	Oromia International Bank (OIB)	0.7848	0.8053	0.7922	0.9038	0.9188	0.8410
15	United Bank (UB)	0.654	0.7094	0.6617	0.6825	0.7972	0.7010
16	Wegagen Bank (WB)	0.8498	0.7503	0.7485	1	0.9445	0.8586
17	Zemen Bank (ZB)	1	1	1	1	1	1

Four major observations were made from the descriptive data. The sector is enjoying a high growth rate: from 100 billion in 2013 to 260 billion assets in 2017 (Figure 1). It achieved a 26.01% average growth rate over five years. While private banks in the same period registered an average of 26.93% growth rate, the state-owned bank had only a 22.85% average growth rate. Of course, the state bank dominated the sector with a 66.01% average market share. This asserts the argument we made in the introductory section, banking in Ethiopia is characterized by mixed features: truly competitive and yet dominated by a state-owned bank.

Figure 1: The asset size of private banks



Moreover, the average growth within private banks is led by small banks (57.14%), followed by medium (31.75%), and large banks (20.99%). Yet, small banks are truly small. For instance, the size of the biggest private bank is more than the size of six (2017) to eight (2013) small banks combined, of course, with a

marked decline in the proportion. Similarly, only the three largest banks in 2017 with an asset of above 101 billion have a bigger size than all private banks combined in 2013 with an asset of about 101 billion (Figure 1).

Table 3: Distribution of hypothetical DMU's merger efficiency score under CRS

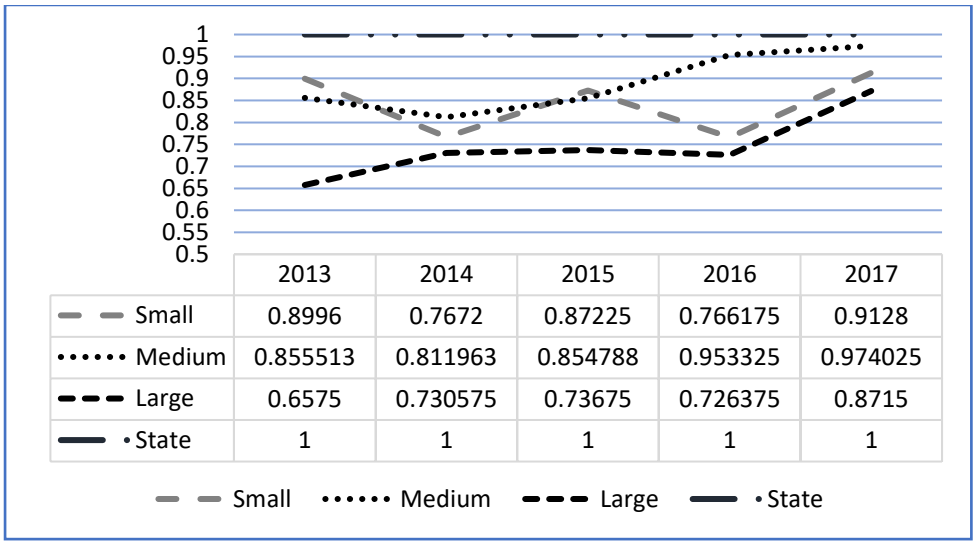
Efficiency Interval in %	Overall	Pure
0-9.99	0	0
10-19.99	0	0
20-29.99	0	0
30-39.99	0	0
40-49.99	0	0
50-59.99	16	0
60-69.99	96	0
70-79.99	201	4
80-89.99	131	30
90-99.99	184	350
100	36	280
>100	0	0

Second, the non-interest expense is larger than the interest expense in private banks but the opposite is true in the state-owned bank. Third, as bank size increases the ratio of non-interest income to interest income decreases, a common phenomenon of emerging market banks (Du & Sim, 2016).

DEA Scores

The average efficiency score of the sector during the study period is 0.8504. It ranges from 0.6933 to 1 (Table 2). State-owned (1.000), medium (0.8899), small (0.8436), and large banks (0.7445), respectively, have the highest efficiency scores over five years (Figure 2).

Figure 2: The average efficiency score of banks



	2013	2014	2015	2016	2017
Small	0.8996	0.7672	0.87225	0.766175	0.9128
Medium	0.855513	0.811963	0.854788	0.953325	0.974025
Large	0.6575	0.730575	0.73675	0.726375	0.8715
State	1	1	1	1	1

Merger Analysis

In most real applications of bank mergers only two banks are merged (Du & Sim, 2016; Shi et al., 2017). Accordingly, merger analysis is conducted between different sizes and ownership structures. The overall merger efficiency has two components: pure and technical. While technical efficiency is achieved through learning, pure efficiency is achieved through a physical merger.

There are 664 hypothetical DMUs set for analysis. About 95% of them have a chance to improve their overall efficiency if M&A takes place. However, strategic fit exists only among 58% of them implying most efficiency gains are through learning than the pure merger. Technical efficiency can be gained by more than 92% of the hypothetical DMUs, much higher than gained through the pure merger.

The pure efficiency gain is a result of strategic fit among merging units. It has two components: harmony and scale effect. While the potential gain from the harmony effect comes through resource and service complementarity, the scale effect is achieved through gaining economies of scale. The analysis shows a 58% harmony effect and no scale effect.

A. Discussions on Bootstrapped Tobit Regression result for a private small bank

From Table 4 we can see that small banks by merging with other private banks resulted in increasing the overall efficiency of small private banks by 22.7% which is interpreted as the average OME gain with other small banks. Likewise, the panel regression analysis shows a 16.5%, 25.1%, and 0% average OME gain for M&A of small banks, medium, large, and state-owned banks, respectively (Table 4). The result indicated that overall merger and efficiency with large-size private banks. Therefore, the study implies that the strategic fit for small banks is large-sized private banks compared to the gains from merging with small, medium, large, and state-owned banks (Kumar et al., 2021). The average PME gain for a small bank M&A with a small, medium, large, and state-owned banks is 3.6%, 2.4%, 0.9%, and -2.1%, respectively, while the LE gain for a small bank M&A with a small, medium, large, and state-owned banks is 19.6%, 13.7%, 23.8%, and -0.9%, respectively.

Table 4: Bootstrapped Tobit Regression Analysis regression for the private small bank

	OME	PME	LE	HE
Main				
Ssize	0.773***	0.964***	0.804***	0.964***
	(33.65)	(100.22)	(35.34)	(100.22)
Msize	0.835***	0.976***	0.863***	0.976***
	(80.89)	(232.54)	(84.30)	(232.54)
Lsize	0.749***	0.991***	0.762***	0.991***
	(52.44)	(171.18)	(53.73)	(171.18)
State	1.000***	1.021***	1.009***	1.021***
	(33.26)	(77.74)	(33.49)	(77.74)
sigma_u				
_cons	0.0460***	0.0164***	0.0463***	0.0164***
	(5.63)	(3.91)	(5.69)	(3.91)
sigma_e				
_cons	0.0925***	0.0393***	0.0901***	0.0393***
	(20.06)	(17.22)	(19.82)	(17.22)
N	274	274	274	274

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The analysis also indicates any PME gain for a small bank from M&A with any other domestic bank is realized through economies of scope but none from economies of scale. Moreover, the gain from LE is much higher than the gain from PME. Connecting the different econometric estimations, the best M&A scenario for a small bank is to merge with large banks through a full-merger possibility that exists only with other small banks. Finally, the merger of a small bank with a state-owned bank is a disaster entailing a loss in efficiency (both pure and technical). The result is consistent with Walter (2004), Georgios & Georgios (2011).

B. Discussions on Bootstrapped Tobit Regression result for medium-size private bank

The OME gain for a medium-size private bank merger with small, medium, large, and state-owned banks is 16.9%, 14.6%, 22.8%, and -2.1% while the PME gain is 2%, -0.1%, 0.2%, and -6.6%, respectively (Table 5). The LE gain for a medium-size private bank merger with similar banks indicate 14.3%, 12.5%, 20.6%, and -3.0%, respectively. It is evident from the results that all PME gains are realized through HE while there is zero SE effect. Moreover, for a medium-sized private bank merger with a state-owned bank, the worst scenario is a consistent efficiency loss, indicating no learning and strategic alignment (Marx et al., 2021). Finally, the result shows medium-size private banks have a strategic fit only with small-size private banks.

Table 5: Bootstrapped Tobit regression result for private medium bank

	OME	PME	LE	HE
Main				
Ssize	0.831***	0.980***	0.857***	0.980***
	(76.94)	(155.58)	(77.04)	(155.58)
Msize	0.854***	1.001***	0.875***	1.001***
	(78.46)	(146.38)	(78.55)	(146.38)
Lsize	0.772***	0.998***	0.794***	0.998***
	(73.91)	(156.49)	(73.46)	(156.49)
State	1.021***	1.066***	1.030***	1.066***
	(44.26)	(62.37)	(42.53)	(62.37)
sigma_u				
_cons	0.0533***	0.0284***	0.0592***	0.0284***
	(7.71)	(7.19)	(8.45)	(7.19)
sigma_e				
_cons	0.0896***	0.0539***	0.0851***	0.0539***
	(25.52)	(19.71)	(25.03)	(19.71)
N	492	492	492	492

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001

C. Discussions on Bootstrapped Tobit Regression result for large private bank

The OME gain for a large private bank merger with a small, medium, large, and state-owned banks is 25.8%, 23.7%, 27.1%, and 2.7%, while the PME gain is 0.9%, 0.9%, 1%, and -21.9%, respectively (Table 6). The LE gain of a large bank merger with a small, medium, large, and state-owned banks is 24.7%, 22%, 25.7%, and 2.7%, respectively. The result also indicates large banks have a strategic fit with different size private banks by margins, but not with the state-owned bank. Finally, all gains from a full merger are realized through economies of scope. Finally, the analysis consistently showed large banks will gain the highest efficiency if they merge with large banks. This is consistent with Bakhouche et al. (2022) who investigated Tunisian banks, and Wanke et al. (2021) in American large and small private airlines.

Table 6: Bootstrapped Tobit regression result for a private large bank

	OME	PME	LE	HE
Main				
Ssize	0.742***	0.991***	0.753***	0.991***
	(71.95)	(159.38)	(73.97)	(159.38)
Msize	0.763***	0.991***	0.780***	0.991***
	(107.33)	(215.81)	(111.13)	(215.81)
Lsize	0.729***	0.990***	0.743***	0.990***
	(44.40)	(103.57)	(45.85)	(103.57)
State	0.973***	1.219	0.973***	1.219
	(48.37)	(0.18)	(48.99)	(0.18)
sigma_u				
_cons	3.65e-19	0.0230***	9.28e-20	0.0230***
	(0.00)	(6.31)	(0.00)	(6.31)
sigma_e				
_cons	0.0899***	0.0345***	0.0888***	0.0345***
	(23.92)	(15.17)	(23.92)	(15.17)
N	286	286	286	286

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

D. Discussions on Bootstrapped Tobit Regression Result for a Private State-owned Bank

From the result in Table 7, merging a private bank with a state-owned bank is statistically significant except with pure merge efficiency with large banks and Harmony or Scope Efficiency with large-sized banks as shown below. The OME gain for a state-owned bank merger with a small, medium, and large private banks is 0.3% (1-0.997), 0.4% (1-0.996), 2.5% (1-0.975) while the PME gain is -1.9%, -3.9%, and -26.7%, respectively (Table 7). The LE gain for a state-owned bank merger with a small, medium, and large private banks is 0.2%, 0.2%, and 2.5%, respectively. The analysis shows the merger efficiency gain for the state-owned banks is marginal and all through learning from large private banks. We can thus, infer that a full merger is not a feasible option for the State-owned bank. The result is consistent with Sharma & Ahuja (2021) who investigated Indian Banks, Chupradit et al. (2021) in Pakistan Banks, and Lien (2022) in Vietnam Commercial banks.

Table 7: Bootstrapped Tobit regression result for a private and state-owned bank

	OME	PME	LE	HE
Main				
Ssize	0.997***	1.019***	0.998***	1.018***
	(178.96)	(85.37)	(278.21)	(94.62)
Msize	0.996***	1.039***	0.998***	1.039***
	(244.94)	(78.65)	(371.83)	(81.52)
Lsize	0.975***	1.267	0.975***	1.225
	(172.06)	(0.00)	(219.33)	(0.05)
sigma_u				
_cons	0.00703	0.0107	0.00492	0.0000630
	(1.81)	(0.74)	(1.66)	(0.02)
sigma_e				
_cons	0.0197***	0.0377***	0.0116***	0.0390***
	(10.28)	(4.82)	(9.42)	(5.23)
N	79	79	79	79

t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

6. Concluding Remarks

The study aimed to analyze the strategic fit and efficiency gained from a potential domestic bank M&A in Ethiopia. We conclude little or no strategic fit between domestic banks in Ethiopia to trigger M&A. Second, most efficiency gains will be realized through benchmarking without necessarily undergoing a full-scale merger. Third, there is no size effect expected from any future bank M&A. Fourth, large private banks will be the centers of future M&A activity in Ethiopia while the state-owned bank will be the least preferred and interested. Therefore, future bank M&A will be among private banks and mainly an acquisition type. Moreover, any gain from a full-scale merger will be a harmonious effect. Finally, we conclude no clear relationship between bank size and efficiency performance.

7. Recommendation and Policy Implication

The findings also have implications for policy and future research. Concerning policy, the result is that the probability of a local banks M&As tends to support a continued role for prospective entry. The study recommends the need for banks to establish a list of the most popular benefits enjoyed by most banks. This will help banks to map out effective strategies that will help the success of strategic mergers, which eventually will help in building a competitive advantage that can be sustained in the long run. The largest efficiency gains from mergers are technical (learning) efficiency gains. This is because the implications of learning or technical efficiency are taken into account but learning efficiency gains do not necessitate full-scale mergers. The study implied that if the banks learn the best practices, they can manage to become more efficient which leaves pure merger efficiency, a combination of size or scale efficiency, and harmony or scope efficiency.

References

Adams, R. (2003). Perceptions of innovations: exploring and developing innovation classification.

Alemu, S. (2015). Determinants of commercial banks profitability: The case of Ethiopian commercial banks (Doctoral dissertation, Addis Ababa University).

Allred, B. B., Boal, K. B., & Holstein, W. K. (2005). Corporations as stepfamilies: A new metaphor for explaining the fate of merged and acquired companies. Academy of Management Perspectives, 19(3), 23-37.

Amore, M. D., & Murtinu, S. (2019). Tobit models in strategy research: Critical issues and applications. *Global Strategy Journal*.

Andrade, G., & Stafford, E. (2004). Investigating the economic role of mergers. *Journal of Corporate Finance*, 10(1), 1-36.

Arikawa, Y., & Miyajima, H. (2007). Understanding the M&A boom in Japan: What drives Japanese M&A?

Aurora, R. S., Shetty, K., & Kale, S. R. (2011). *Mergers and acquisitions*. Oxford University Press.

Bakhouche, A., Naouar, A., Boulkeroua, M. L., Elchaar, R., Bocanet, A. & Zabalawi, E. (2022). Efficiency and Market Power in Tunisian Banking. In *Contemporary Research in Accounting and Finance* (pp. 1-44). Palgrave Macmillan, Singapore.

Barua, A., & Ioanid, A. (2021). Synergistic Competitive Advantage: The Modern Appeal of RBV and IO Theory in the Mergers and Acquisitions (No. bep-2021-06). Faculty of Economics and Business Administration, Sofia University St. Kliment Ohridski-Bulgaria//Center for Economic Theories and Policies at Sofia University St. Kliment Ohridski.

Bogetoft, P., & Wang, D. (2005). Estimating the potential gains from mergers. *Journal of Productivity Analysis*, 23(2), 145-171.

Bradley, M., Desai, A., & Kim, E. H. (1988). Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms. *Journal of Financial Economics*, 21(1), 3-40.

Brealey, R. A., Myers, S. C., & Allan, F. (1991). *Principles of Corporate Finance*, McGraw Hill. Inc., USA.

Calipha, R., Tarba, S., & Brock, D. (2010). Mergers and acquisitions: a review of phases, motives, and success factors. Advances in mergers and acquisitions, 9(1), 1-24.

Cartwright, S. (1998). International mergers and acquisitions: the issues and challenges. Cultural dimensions of international mergers and acquisitions, 85, 5.

Cartwright, S., & Cooper, C. L. (1990). The impact of mergers and acquisitions on people at work: Existing research and issues. *British Journal of Management*, 1(2), 65-76.

Cartwright, S., & Schoenberg, R. (2006). Thirty years of mergers and acquisitions research: Recent advances and future opportunities. *British Journal of Management*, 17(S1), S1-S5.

Cartwright, S., Teerikangas, S., Rouzies, A., & Wilson-Evered, E. (2012). Methods in M&A - A look at the past and the future to forge a path forward.

Celtekligil, K. (2020). Resource Dependence Theory. In Strategic Outlook for Innovative Work Behaviours (pp. 131-148). Springer, Cham.

CEPHEUS Growth Capital Partners. (2019a). Ethiopia's Banking Sector. Retrieved from https://cepheuscapital.com/wp-content/uploads/2019/01/Banking-Sector-Paper.pdf

_____. (2019b). Ethiopia Macroeconomic Handbook 2019. Retrieved from https://cepheuscapital.com/wp-content/uploads/2019/01/ Macroeconomic-Handbook-2019.pdf.

Cha, H. (2020). A paradigm shift in the global strategy of MNEs towards business ecosystems: A research agenda for new theory development. *Journal of International Management*, 26(3), 100755.

Ching, K. (2019). What Drives Merger Waves? A Study of the Seven Historical Merger Waves in the US.

Chiu, Y. H., Lin, T. Y., Chang, T. H., Lin, Y. N., & Chiu, S. Y. (2021). Pre-valuating efficiency gains from potential mergers and acquisitions in the financial industry with the Resample Past–Present–Future data envelopment analysis approach. Managerial and Decision Economics, 42(2), 369-384.

Christensen, C. M., Alton, R., Rising, C., & Waldeck, A. (2011). The new M&A playbook. Harvard Business Review, 89(3), 48-57.

Chupradit, S., Yannan, D., Kamran, H. W., Soudagar, S. S., Shoukry, A. M., & Khader, J. A. (2021). Measuring technical efficiency associated with environmental investment: does market competition and risk matters in banking sector. Environmental Science and Pollution Research, 28(47), 66575-66588.

Čirjevskis, A. (2021). Exploring the link of real options theory with dynamic capabilities framework in open innovation-type merger and acquisition deals. *Journal of Risk and Financial Management*, 14(4), 168

Cortés, L. M., Agudelo, D. A., & Mongrut, S. (2017). Waves and determinants in mergers and acquisitions: The case of Latin America. Emerging Markets Finance and Trade, 53(7), 1667-1690.

Das, A., & Kapil, S. (2012). Explaining M&A performance: a review of empirical research. *Journal of Strategy and Management.*

Dieudonne, S., Cretin, F., & Bouacha, S. (2014). M&A activity: where are we in the Cycle? Available at SSRN 2504412.

Duan, Y., & Jin, Y. (2019). Financial constraints and synergy gains from mergers and acquisitions. *Journal of International Financial Management & Accounting*, 30(1), 60-82.

Du, K., & Sim, N. (2016). Mergers, acquisitions, and bank efficiency: Cross-country evidence from emerging markets. Research in International Business and Finance, 36, 499-510.

Du, K., Worthington, A. C., & Zelenyuk, V. (2018). Data envelopment analysis, truncated regression and double-bootstrap for panel data with application to Chinese banking. *European Journal of Operational Research*, 265(2), 748-764.

Faulkner, D., Teerikangas, S., & Joseph, R. J. (Eds.). (2012). *The handbook of mergers and acquisitions.* Oxford University Press.

Gadiesh, O., & Ormiston, C. (2002). Six rationales to guide merger success. Strategy & Leadership.

Gattoufi, S., Amin, G. R., & Emrouznejad, A. (2014). A new inverse DEA method for merging banks. *IMA Journal of Management Mathematics*, 25(1), 73-87.

Georgios, K., & Georgios, H. (2011). Du Pont Analysis of a Bank Merger and Acquisition between Laiki Bank from Cyprus and Marfin Investment Group from Greece. Is there an increase of profitability of the new bank? Kyriazopoulos-Hadjimanolis, MIBES 2011–Oral, 157-176.

Gort, M. (1969). An economic disturbance theory of mergers. *The Quarterly Journal of Economics*, 624-642.

Gugler, K., Mueller, D. C., Weichselbaumer, M., & Burcin Yurtoglu, B. (2012). Market optimism and merger waves. Managerial and Decision Economics, 33(3), 159-175.

Hankir, Y., Rauch, C., & Umber, M. P. (2011). Bank M&A: A market power story? *Journal of Banking & Finance*, 35(9), 2341-2354.

Harford, J. (2005). What drives merger waves? *Journal of Financial Economics*, 77(3), 529-560.

Haspeslagh, P. C., & Jemison, D. B. (1991). *Managing acquisitions: Creating value through corporate renewal* (Vol. 416). New York: Free Press.

Haunschild, P. R. (1993). Interorganizational imitation: The impact of interlocks on corporate acquisition activity. Administrative science quarterly, 564-592.

Hill, C. W., Jones, G. R., & Schilling, M. A. (2014). Strategic management: Theory & cases: An integrated approach. Cengage Learning.

Ishwarya, J. (2019). A Study on Mergers and Acquisition of Banks and a Case Study on SBI and its Associates. *International Journal of Trend in Research and Development*, September, 22, 26.

Jagtiani, J., & Maingi, Q. (2018). How Important Are Local Community Banks to Small Business Lending? Evidence from Mergers and Acquisitions [REVISED].

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, 48(3), 831-880.

Jovanovic, B., & Braguinsky, S. (2004). Bidder discounts and target premia in takeovers. American Economic Review, 94(1), 46-56.

Junni, P., & Teerikangas, S. (2019). Mergers and Acquisitions. In Oxford Research Encyclopedia of Business and Management.

Kale, P., Singh, H., & Raman, A. P. (2009). Don't integrate your acquisitions, partner with them. Harvard business review, 87(12), 109-115.

Kastrinaki, Z., & Stoneman, P. (2012). The drivers of merger waves. Economics Letters, 117(2), 493-495.

Kebede, T. (2017). Investigation of potential benefit and risks resulting from foreign-owned bank entry in Ethiopian banking sector (Doctoral Dissertation, St. Mary's University).

Kleinert, J., & Klodt, H. (2002). Causes and consequences of merger waves (No. 1092). Kiel Working Paper.

Kimotho, T. N. (2018). Influence of mergers and acquisitions on financial performance of firms listed in Nairobi securities exchange (Doctoral dissertation, Strathmore University).

Kiymaz, H., & Baker, H. K. (2008). Short-term performance, industry effects, and motives: evidence from large M&As. *Quarterly Journal of Finance and Accounting*, 17-44.

Kohli, R., & Mann, B. J. S. (2012). Analyzing determinants of value creation in domestic and cross border acquisitions in India. International Business Review, 21(6), 998-1016.

Kumar, C. S., Wadhawan, N., Mahapatra, M., & Bhayana, P. (2021). Post-merger financial analysis on bank mega merger: An empirical study 2019-20. Ilkogretim Online, 20(5).

Lee, L. W. (2013). Merger wave in a small world: Two views. *The Journal of Socio-Economics*, 43, 68-71.

Lee, K. Y. U. N. G. M. O. O. K., & Pennings, J. M. (1996). Mergers and Acquisitions: Strategic–Organizational fit and outcomes. The Wharton School, University of Pennsylvania.

Lien, D. T. (2022). The Evaluation of Effectiveness of Commercial Banks Participating in M&A in Vietnam. Eurasian Scientific Herald, 4, 35-46.

Lynch, R. L., & Smith, J. R. (2006). *Corporate strategy*. Harlow, England: FT/Prentice Hall.

Maharshi, A. V. (2019). Mergers and acquisitions in banking sector of India. *International Journal of Research in Social Sciences*, 9(6), 722-728.

Martynova, M. V., & Renneboog, L. D. R. (2005). Takeover waves: triggers, performance and motives. Tilburg University.

_____. (2008). A century of corporate takeovers: What have we learned and where do we stand? *Journal of Banking & Finance*, 32(10), 2148-2177.

Marx, B., Haji, A. M., Botha, I., Madikizela, B., & Madiba, T. (2021). Special purpose acquisition companies as a vehicle for providing venture capital to small and medium size enterprise. *Journal of Economic and Financial Sciences*, 14(1), 9.

Mekonnen, Y., Kedir, H., & Shibru, W. (2015). Soundness of Ethiopian Banks. *International Journal of Finance & Banking Studies*.

Meseret, M. (2019). The Legal and Regulatory Framework on Merger of Banks in Ethiopia: The Reality on the Ground and the Prospects in the Future (Doctoral dissertation, Addis Ababa University).

Motis, J. (2007). Mergers and acquisitions motives. Toulouse School of Economics EHESS (GREMAQ) and University of Crete. Retrieved from economics. soc. uoc.gr/wpa/docs/paper2mottis. PDF.

Mulherin, J. H., & Boone, A. L. (2000). Comparing acquisitions and divestitures. *Journal of Corporate Finance*, 6(2), 117-139.

Nahavandi, A., & Malekzadeh, A. R. (1988). Acculturation in mergers and acquisitions. Academy of management review, 13(1), 79-90.

Narayanan, M. P., & Nanda, V. K. (2006). *Finance for strategic decision making: What non-financial managers need to know?* John Wiley & Sons.

Nguyen, H. T., Yung, K., & Sun, Q. (2012). Motives for mergers and acquisitions: Ex-post market evidence from the US. *Journal of Business Finance & Accounting*, 39(9-10), 1357-1375.

Öberg, C., & Holtström, J. (2005). Are mergers and acquisitions contagious? Conceptualising Parallel M&As. In 21st IMP-conference in Rotterdam, Netherlands in 2005.

Ombaka, C., & Jagongo, A. (2018). Mergers and acquisitions on financial performance among selected commercial banks, Kenya. *International Academic Journal of Economics and Finance*, 3(1), 1-23.

Otchere, I., & Ip, E. (2006). Intra-industry effects of completed and cancelled cross border acquisitions in Australia: A test of the acquisition probability hypothesis. *Pacific-Basin Finance Journal*, 14(2), 209-230.

Park, J. W., Morel, B., & Madhavan, R. (2010, August). Riding the Wave: Self-Organized Criticality in M&A Waves. In Academy of Management Proceedings (Vol. 2010, No. 1, pp. 1-6). Briarcliff Manor, NY 10510: Academy of Management.

Pereira, V., Budhwar, P., Temouri, Y., Malik, A., & Tarba, S. (2021). Investigating Investments in agility strategies in overcoming the global financial crisis-The case of Indian IT/BPO offshoring firms. *Journal of International Management*, 27(1), 100738.

Rahman, M. (2022). A Critical Review of Neoclassical and Behavioural Theories of Merger Waves. A Critical Review of Neoclassical and Behavioural Theories of Merger Waves (June 3, 2022). Financial Studies, 26(1), 6-22.

Rani, P., Shauki, E. R., Darminto, D., & Prijadi, R. (2020). Motives, governance, and long-term performance of mergers and acquisitions in Asia. Cogent Business & Management, 7(1), 1791445.

Rhee, S. (2022). Intercultural Challenges and Cultural Differences Derived from Cross-Border Post M&A Integration Process: Case study (Doctoral dissertation, Wien).

Ribeiro, H. R. (2010). The missing links of mergers & acquisitions waves. *IUP Journal of Business Strategy*, 7(3), 7.

Rozen-Bakher, Z. (2018). The trade-off between synergy success and efficiency gains in M&A strategy. *Euro Med Journal of Business*.

Ruback, R. S., & Jensen, M. C. (1983). The market for corporate control: The scientific evidence. *Journal of Financial Economics*, 11, 5-50.

Salma, G., & Hussain, A. (2020). Synergy, agency cost, and the determinants of premia paid in mergers and acquisitions across Pakistan. *International Journal of Management (IJM)*, 11(8).

Schoenberg, R. (2006). Measuring the performance of corporate acquisitions: An empirical comparison of alternative metrics. *British Journal of Management*, 17(4), 361-370.

Sharma, T., & Ahuja, H. (2021). Indian banks' nationalization and credit growth: A study of few Indian Banks to identify the impact factors. *Asian Journal of Research in Banking and Finance*, 11(2), 1-12.

Shi, X., Li, Y., Emrouznejad, A., Xie, J., & Liang, L. (2017). Estimation of potential gains from bank mergers: A novel two-stage cost efficiency DEA model. *Journal of the Operational Research Society*, 68(9), 1045-1055.

Shleifer, A., & Vishny, R. W. (2003). Stock market driven acquisitions. *Journal of financial Economics*, 70(3), 295-311.

Shughart, W. F., & Tollison, R. D. (1984). The random character of merger activity. The RAND *Journal of Economics*, 500-509.

Singh, S., & Das, S. (2018). Impact of post-merger and acquisition activities on the financial performance of banks: A study of Indian private sector and public sector banks. Revista Espacios Magazine, 39(26), 25.

Song, M. H., & Walkling, R. A. (2000). Abnormal returns to rivals of acquisition targets: A test of the acquisition probability hypothesis'. *Journal of Financial Economics*, 55(2), 143-171.

Stearns, L. B., & Allan, K. D. (1996). Economic behavior in institutional environments: The corporate merger wave of the 1980s. American Sociological Review, 699-718.

Steger, U., & Kummer, C. (2007). Why Merger and Acquisition (M & A) Waves Reoccur: The Vicious Circle from Pressure to Failure. Lausanne, Switzerland: IMD.

Sujud, H., & Hachem, B. (2018). Effect of mergers and acquisitions on performance of Lebanese banks. *International Research Journal of Finance and Economics*, 166(2), 69-77.

Suk, I., & Wang, M. (2021). Does target firm insider trading signal the target's synergy potential in mergers and acquisitions? *Journal of Financial Economics*, 142(3), 1155-1185.

Terjesen, S. (2009). Mergers and Acquisitions: Patterns, Motives, and Strategic Fit of Finance Best Practice.

Town, R. J. (1992). Merger waves and the structure of merger and acquisition time-series. *Journal of Applied Econometrics*, 7(S1), S83-S100.

Walter, I. (2004). *Mergers and acquisitions in banking and finance: what works, what fails, and why*. Oxford University Press.

Wanke, P., Barros, C. P., Azad, M. A. K., & Constantino, D. (2016). The development of the Mozambican banking sector and strategic fit of mergers and acquisitions: A two-stage DEA approach. African Development Review, 28(4), 444-461.

Wanke, P., Antunes, J. J. M., Correa, H. L., & Tan, Y. (2021). Strategic fit of mergers and acquisitions in Latin American airlines: a two-stage DEA approach. Benchmarking: *An International Journal.*

Wanke, P., Maredza, A., & Gupta, R. (2017). Merger and acquisitions in South African banking: A network DEA model. Research in International Business and Finance, 41, 362-376.

Weber, Y. (1996). Corporate cultural fit and performance in mergers and acquisitions. Human relations, 49(9), 1181-1202.

Winkler, R., & Łukasik, P. (2019). Satisfaction in concepts of the organisation's intangible assets and the processes of production preparation. Nauki o Zarządzaniu, 24(2), 41-48

Wu, J., Yu, L., & Khan, Z. (2021). How Do Mutual Dependence and Power Imbalance Condition the Effects of Technological Similarity on Post-acquisition Innovation Performance Over Time? *British Journal of Management.*

Yaghoubi, R., Yaghoubi, M., Locke, S., & Gibb, J. (2016a). Mergers and acquisitions: a review. Part 1. Studies in Economics and Finance.

_____. (2016b). Mergers and acquisitions: a review (part 2). Studies in Economics and Finance.

Yildirim, C., & Öztürkkal, B. (2022). Regional expansion of emerging market banks: Evidence from the Middle East. *Journal of East-West Business*, 28(1), 30-60

Zarei, M., Alambeigi, A., Karimi, P., & Zarei, B. (2015). What drives mergers and acquisitions waves in developing countries? Evidences from Iranian banking industry. Iranian Economic Review, 19(2), 123-137.

Zhu, P., & Jog, V. (2012). Impact on target firm risk-return characteristics of domestic and cross-border mergers and acquisitions in emerging markets. Emerging Markets Finance and Trade, 48(4), 79-101.

Zhu, Q., Li, X., Li, F., & Amirteimoori, A. (2020). Data-driven approach to find the best partner for merger and acquisitions in banking industry. Industrial Management & Data Systems, 121(4), 879-893.