The Impact of Cross-Border Mergers and Acquisitions on Financial Performance and Intangible Assets of Agri businesses in Emerging Countries

Abstract

This study examines the effects of mergers and acquisitions on the intangible assets and financial performance of acquiring agribusiness firms based in emerging countries. This study uses data from 25 companies operating in the agriculture industry in emerging countries, covering the period from 2015 to 2020. In order to investigate these effects, this study uses data envelope analysis (DEA) and the Tobit model, along with sample t-tests. The analysis compares the values of intangible assets and the financial performance of firms before and after mergers & acquisitions. The findings of this study reveal insights into how M&A activities influence the intangible assets and financial performance of acquiring agribusinesses in emerging economies. The results reveal a positive change in intangible assets and financial performance after a merger or acquisition. There can be many other strategic advantages to acquiring firms while they acquire or merge their businesses in developed countries.

Keywords: Mergers and Acquisitions; Financial Performance; Intangible Assets; Emerging Economies

1. Introduction

Cross-border mergers and acquisitions (M&A) have evolved as a strategic instrument for organizations to obtain a competitive edge and encourage sustainable growth in an era characterized by globalization and the continuous expansion of multinational corporations. Cross-border M&A in the agri-business sector in emerging markets has increased rapidly in recent years. There can be many reasons why firms opt for a merger and acquisition strategy. For example, some firms want to expand their business in developed countries; some want to utilize their economies of scale; some want to capture a wider market; and some of them may intend to bring modern technology to their processes. Such deals may also increase the market share of the acquiring firms (Gombár et al., 2022). Contrary to the expanding evidence of cross-border M&A in agricultural business, there is still a need for in-depth research to discover the longer link between those M&A operations, intangible assets, and financial performance. The critical point here is the lack of competence possessed by the acquiring firms to identify and maximize the intangible assets acquired and then link them to the financial performance of the organization, therefore imposing a strategic restraint on the maneuvering of M&A activities by the acquiring firm.

This study aims at analyzing the impact of cross-border mergers and acquisitions on intangible assets and the financial performance of agribusiness firms in emerging economies. This study, based on data from 25 companies operating in the agriculture industries of emerging economies, will focus on revealing how their intangible assets and financial performance have been impacted by M&A transactions. Furthermore, this study looks into the emerging strategic advantages and challenges of mergers and acquisitions across borders in the agri-business sector.

In the latest decades, global mergers and acquisitions in the agri-industry of developing countries have been up at a considerable rate. Various deals, including these kinds, can be considered the key moments of market growth, export, and utilization of fungible resources (resources that can be used over and over and do not change in the process). This is important to analyzing the core aims of any entrepreneur or investor to purchase or divest a company, respectively. Bearing this in mind, it both fills a knowledge void and also challenges the traditional way of approaching the strategic management processes of agribusinesses operating in developing countries. M&A in agribusinesses may have crucial consequences as regards the concentration of agricultural production in terms of its ownership by certain large enterprises. The shape and ratio of the agricultural business sector can be decided by the M&A deals. This impacts the way the agricultural sector is structured. Moreover, the merger in the agrarian context could be associated with intellectual property acquisition, which is actually of great importance in determining whether the combined companies will be efficient in their tasks and get a competitive advantage (Gupta & Roos, 2001). Through the intellectual capital angle viewpoint in the M&A deals, one can draw a conclusion on how the intangible assets carry their worth to the overall value creation and performance of the agricultural businesses after the business is bought.

The literature suggests that M&A has witnessed performance improvement, geographic expansion, and trade expansion in emerging countries. On the contrary to this argument, Ye and Zou (2021) warn that such M&A deals with emerging countries might be risky as well, and many considerations are essential in this regard. In developing nations, agricultural businesses often encounter obstacles when engaging in mergers and acquisitions. These obstacles may involve resources, restrictions on available resources, adapting to evolving regulatory frameworks, and navigating unfamiliar cultural and market environments (Jin & Hu, 2018). Therefore, Hakimi et al. (2020) conclude that there is a need for careful investigation of the challenges associated with such strategic undertakings. Because the impact of these challenges on the performance of agribusinesses before and after M&A transactions is not immediately apparent (Hečková et al., 2016), it becomes crucial to tackle these obstacles in order to promote success and sustainability in the ever-changing global agribusiness environment. This study delves into the dynamics of MM&A, with an emphasis on intangible assets and financial performance. Acquiring businesses from developed nations can bring about advantages. In the agri-industry, it is typically necessary to access cross-border manufacturing relationships with foreign firms and customers, which can significantly improve the financial performance of firms in emerging countries and ultimately accelerate firm viability and resilience. It has the potential to enhance competitiveness, foster innovation, modernize systems, expand market reach, achieve economies of scale, and increase the intangible assets of firms. There is a very famous acquisition case in which China National Chemical Corporation (ChemChina) acquired Syngenta, a Swiss agrochemical company, in Spain. This acquisition was part of a broader trend of Chinese companies investing in global agricultural assets. Such kinds of mergers and acquisitions are essentially needed to be empirically tested to conclude the hidden relationships or advantages. So, this study is such an effort that explores

whether or not M&A particularly with the firms of developed countries can improve the financial situations of agri-businesses of emerging countries.

While talking about agribusinesses in emerging countries, the existing research informs us about resource scarcity, rapidly changing customer demands, and technological deficiencies. In response, the agribusiness sector is progressively using cross-border M&A to improve their technological flaws, managerial knowledge, and internationalization (Liu, 2022). But there is still an obvious lack of research that reports the precise effects of M&A on intangible assets and financial performance prior to and after mergers and acquisitions. This study fills this gap by focusing on changes in intangible assets and financial performance of acquiring firms as a result of M&A in developed countries. We endorse the argument of Lobanova et al. (2018) that cross-border transactions are derived by globalization and increasing multinational firms but the agribusiness industry needs special attention and investigation because of its distinctive characteristics. Dynamics include global supply chain, economies of scale, regulatory compliance, risk diversification, brand recognition, technological enhancement, etc.

Although previous studies by Haakantu & Phiri (2022) and Binh et al. (2020) have examined the effects of intangible assets on company performance and valuation, there is still a clear research gap regarding the explicit examination of the impact on intangible assets and financial performance in the context of M&A transactions. The extant body of literature has examined multiple facets within the field, encompassing topics such as the underlying motivations driving cross-border M&A (Tripathi & Lamba, 2015), the relationship between intangible assets and the practice of earnings management (Kimouche, 2022), and the impact of mergers and acquisitions on promoting long-term business sustainability (Ogendo & Ariemba, 2022). Furthermore, the existing literature is mainly focused on probing the financial values of M&A in various industries and countries (Bajgai & Pradhan, 2021; Boloupremo & Ogege, 2019; Rastić et al., 2021), but there remains a significant gap in the agri-industry, with a special focus on pre- and post-merger or acquisition analysis of the acquiring firms.

Similarly, several studies (Albert & Maudos, 2022; Karim et al., 2020; Lopes & Carvalho, 2021; Sule et al., 2021) have investigated the effects of intangible assets on organizational performance, but these are not related to this study as their focus was not on mergers and acquisitions. Similar to such studies, some studies (Annosi 2020; Barel-Shaked, 2023; Martos-Pedrero et al., 2022) studied the role of innovation in the agri-food industry, the comparison of family and non-family small firms in their approach to green innovation, and the drivers and outcomes of corporate social responsibility in agri-food firms, while ignoring how these factors affect the financial implications of M&A transactions in the agri-business sector.

Developing a comprehensive understanding of the implications related to M&A within the agricultural business sector is of foremost significance for professionals, policymakers, and researchers alike. The aforementioned initiatives influence the competitive landscape, boost

economic growth, and develop emerging markets. This study would improve our understanding of how intangible assets, such as intellectual capital and information sharing, affect financial performance in M&A in the agri-business industry. This would allow researchers to theoretically develop the relationship between intangible assets and agri-business financial success. This study empirically tests hypotheses to gain insight into emerging market agri-businesses' strategic decisions and contribute to M&A exchanges. This study fills the research gap by examining 25 companies from emerging economies that deliberately bought agribusinesses in developed economies. These mergers are believed to accelerate the discovery and integration of intangible assets, boosting financial performance. This study uses two-stage window data envelopment analysis (DEA) and the Tobit regression model to understand the relationship between M&A, intangible assets, and financial performance. By examining the post-merger years, we can shed light on how these mergers transformed the intangible assets of acquiring agribusinesses and to what extent they improved their financial performance.

The rest of the study is presented in such a sequence that Section 2 explains the literature review; Section 3 presents the methodology; Section 4 explains the results and discussion; and Section 5 concludes this study with policy recommendations and study limitations.

2. Literature Review

Several aspects of this study set it apart from others, drawing attention to the originality of its contribution to the study of M&A as they pertain to companies from developing markets expanding into developed nations. Firstly, it differs from other studies because of its exclusive concentration on the agricultural sector; prior research has frequently ignored the intricacies of agri-businesses in favor of studying a wider range of industries. Moreover, there is a framework that hasn't been thoroughly explored in previous research. It involves using data envelopment analysis (DEA) and the Tobit model to compare the performance and intangible assets before and after a merger or acquisition.

This research addresses a gap in our understanding by investigating how mergers and acquisitions impact the assets and financial performance of businesses from emerging markets as they expand into developed countries. Although there have been studies examining the effects of mergers and acquisitions on metrics, there haven't been many that explore the role of assets such as intellectual property, branding, and human capital in post-acquisition performance. Furthermore, there is a significant gap in the current literature due to the absence of research that is explicitly designed for the agriculture sector and developing market enterprises within this framework. This research fills that need by illuminating the specific elements at work in the agri-business sector, which improves our knowledge of how cross-border M&A affects companies in developing nations.

2.1 Cross-border M&A in Emerging market

Geographical expansion and diversity are two examples of the kinds of strategic goals that can be advanced by agribusinesses through cross-border M&A (Gombár et al., 2022). Furthermore, they appear to be a crucial asset in attaining a competitive advantage (Gombár et al., 2022). Cross-border M&A can be a valuable strategy for agribusinesses in emerging nations to acquire intangible assets, technologies, and expertise from developed countries (Singla et al., 2012). Nevertheless, there is a dearth of agreement about its effect on financial performance since various studies have discovered noteworthy effects while others have uncovered insignificant effects, such as The impact of cross-border M&A being influenced by the integration of cultures and management styles (Minakov, 2022), the choice between standardizing and adapting approaches (Rao-Nicholson & Khan, 2017), and the institutional distance across regions (Liu, 2022). There are risks associated with cross-border M&A, such as dealing with cultural differences, overcoming regulatory hurdles, and entering new markets (Ye & Zou, 2021). Financial risks and value issues are also widespread (Ye & Zou, 2021). Economic and financial deregulation in regions like the European Union (EU) has facilitated increased feasibility of cross-border M&A activity (Hečková et al., 2016). Cross-border mergers and acquisitions, however, can be influenced by regulations imposed by governments and industry authorities (Zhang et al., 2018).

2.2 Pre- and Post-Merger & Acquisitions

The financial performance of agribusinesses both before and after mergers and acquisitions is an area of research. Numerous studies have examined the relationship between these factors. Gachigo et al. (2022) conducted a study analyzing the impact on the performance of banks in Kenya by calculating average ratios over a three-year period before and after mergers or acquisitions (Gachigo et al., 2022). This study emphasized the significance of evaluating performance post-M&A for commercial banks in Kenya. In research conducted by Roopesh & Sandhya (2022) focusing on public sector banks in India, it was found that mergers and acquisitions had an influence on performance. The period following the merger showed stability compared to before the merger. However, Ahmed et al. (2018) demonstrated that merged companies did not experience an improvement in profitability, asset turnover, or stability post-merger when compared to their merger levels. They suggest that the impact of M&A on performance can vary depending on the circumstances. Aitaa & Mabel (2023) revealed an improvement in the performance of the banking industry after their merger. These findings indicate that M&A can have an impact on the performance of areas. Abbas et al. (2014) discovered that there was no difference in the financial performance of banking organizations prior to and following M&A. As a result, it is necessary to conduct research to gain an understanding of the diverse effects that M&A has on financial performance.

2.3 Financial Performance and Mergers & Acquisitions

In the world of mergers and acquisitions, various financial factors play a role. Many financial key indicators can be used to depict the financial performance of a company. For example, earnings

before interest and taxes (EBIT) is the most common indicator that shows financial performance. Similarly, earning per share, net worth of the company, total equity and worth of intangible assets an organization owns. In this regard, agri-businesses are also important and possess attraction for investors. A recent study conducted by Trejo Pech et al. (2021) shed light on the aspects of mergers and acquisitions in the US agri-business sector. The study revealed that agri-businesses demonstrating performance tend to attract investors and partners for M&A transactions. Similarly, Katchova and Enlow (2013) emphasized the importance of food manufacturing agribusinesses in investment portfolios, showcasing their accomplishments. This underscores how performance in the sector is significant when it comes to mergers and acquisitions.

Some studies have explored the relationship between M&A and financial performance, specifically in the agribusiness industry. For example, Aitaa & Mabel (2023) argued that M&A enhances financial performance by increasing the market share of the companies, improving financing availability, and reaping more returns on investment. Their study sheds light on how the performance of agribusiness firms is influenced by their involvement in these business transactions. When agri-businesses effectively integrate and utilize their combined resources, they have the potential to reap such advantages. Understanding the impact of support is essential for comprehending the success of agribusinesses. In a study conducted by Gill et al. (2018), they examined how financial assistance from family members influences the profitability of established firms in India. The authors emphasize that this type of support significantly affects the outcomes achieved by agribusinesses (Gill et al., 2018). This underscores the role that financial support can play in determining a firm's performance within the context of mergers and acquisitions. Keeping the above discussion in mind, this study designs first hypothesis as follows:

H_1: Acquiring a firm strengthens the financial performance of acquiring firms in emerging countries

2.4 Mergers & Acquisitions and Intangible Assets

Understanding the impact of mergers and acquisitions (M&A) on assets holds importance in the agribusiness industry. In this sector, intangible assets such as creativity, customer loyalty and knowledge capital play a role in evaluating and achieving M&A deals. Numerous scholarly studies present varying viewpoints on this connection. According to Filipovic (2019), the pursuit of value through assets often motivates M&A activities in agribusiness, highlighting the importance of considering assets when making decisions and assessing outcomes in endeavors.

Moreover, Perwito et al. (2021) have established a connection between market capitalization and mergers and acquisitions in the agribusiness sector. Their research also suggests that companies with a share of assets tend to utilize leverage, indicating the role these assets play in shaping arrangements and generating revenue during M&A transactions within the agribusiness industry (Perwito et al., 2021). Zelalem & Abebe (2022) empirically explore how intangible assets impact the performance and policies of banks, shedding light on their significance for success (Zelalem

& Abebe 2022). Additionally, this insight helps us grasp how intangible assets affect the performance of agribusiness enterprises involved in merger and acquisition activities. Furthermore, Mbuthia (2021) conducted a study that revealed acquirers often prefer targets with assets. This finding underscores the importance of assets in influencing decision-making processes during mergers and acquisitions. It is crucial to understand how acquirers perceive and evaluate assets within the agribusiness industry when considering the importance of these findings in relation to mergers and acquisitions.

H_2: Acquiring a firm strengthens the intangible assets of businesses in emerging countries.

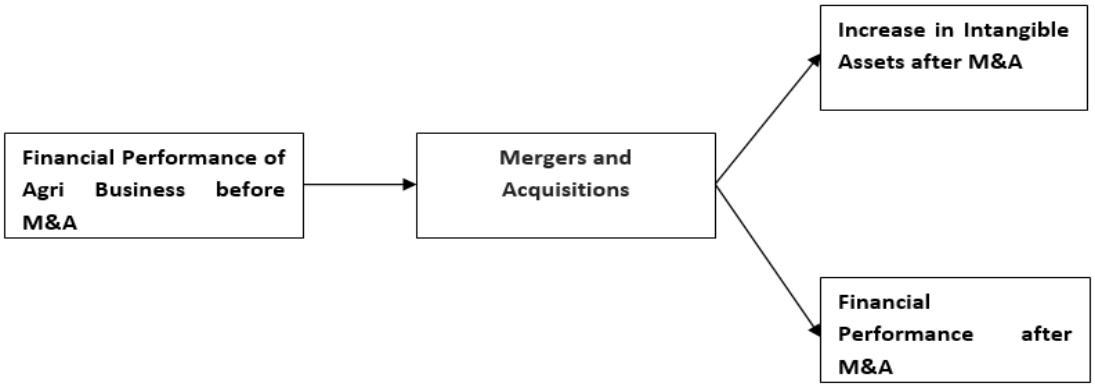

Figure 1: Conceptual Model

3. Methodology

In this research we employ a method called data analysis (DEA) and Tobit regression to examine how cross border mergers and acquisitions (M&A) impact the value of assets and overall performance of acquiring firms, in the agri business sector of emerging markets. DEA is a technique used to measure the efficiency and effectiveness of different entities, such as companies or institutions. Unlike other approaches, DEA does not require weighting of input and output variables, as it calculates the most satisfactory weights automatically. It also allows for benchmarking and identifying strategies by evaluating items in relation to each other. Additionally, DEA provides performance scores. Ranks entities based on their efficiency.

The rationale for choosing the DEA technique and Tobit regression is their applicability to our research goals and the data that we are working with. DEA is chosen given its capability to scrutinize the reliable nature of the acquirer in the agri-business sector of the emerging market regions of the global industry post-cross-border mergers and acquisitions (M&A). This approach shall, therefore, enable us to make a unanimous comparison concerning the output and input variables before and after the completion of the merger/acquisition. On the other hand, Tobit regression is a fitting model for students to investigate the impact of M&A on firm performance, thereby dealing with potential issues of censorship and truncation of the dependent variable. We

can study through Tobit regression the way in which M&A affects firm performance when we include intangible assets, customer relations, and marketing expenditures, among other factors.

For our study, we selected a sample of 25 acquisitions that met certain criteria: comprehensive data availability for both the target and acquiring companies for 2.5 years before the acquisition and 2.5 years after it. The selection process involved a thorough scrutiny of published records and a detailed manual data collection process. Notwithstanding the difficulties in gathering data on border acquisitions by companies from emerging economies, the selected sample size aligns with other research studies on mergers and acquisitions (Bhagat et al., 2011; Liu & Woywode, 2013). By applying DEA window analysis, we were able to increase the sample size to include a total of 125 firm-year observations. To achieve this, we combined data from 25 firms over a span of 5 years (25 firms * 5 years). During the phase, we gathered material on M&A transactions from the Thomsons One Banker database, which is widely recognized for its complete coverage of mergers and acquisitions (M&A) activities. Previous research on M&A projects (Rahman et al., 2016) has often relied on the Thomsons One Banker database due to its reputation for reliability. For this phase, we collected data on input and output variables for both the target and acquiring companies from the COMPUSTAT database. COMPUSTAT is a known database that provides financial information about companies before and after mergers, covering a period of 2.5 years.

By utilizing this database, we ensure the availability of all information, which in turn simplifies the analysis of selected businesses performance. Our research covers a timeframe from 2015 to 2020, with an acquisition observation period of 2.5 years and a post-acquisition observation period of another 2.5 years. This extended duration allows us to closely monitor changes in performance indicators and gain insights into the dynamics before and after acquisition takes place. The analysis conducted through DEA involves two stages. Initially, our focus lies on evaluating efficiency scores for acquiring companies by examining their ability to convert inputs into outputs within the specified time periods. We used DEAFrontier TM developed by Professor Joe Zhu, a Microsoft® Excel add-in for solving data Envelopment analysis (DEA) models. The software can be accessed through DEA Software (deafrontier.net). We also employ Tobit regression as a technique to explore the relationship between border M&A (mergers and acquisitions) and firms overall performance. In this study, we conduct analyses that consider various independent variables, such as acquisition scale and the characteristics of the acquired firm. The goal is to identify the factors that impact acquiring firms financial performance following mergers and acquisitions (M&A).

In a two-stage DEA model, the efficiency assessment is carried out using a dual-step approach. In the first stage, efficiency of all DMUs in utilizing the inputs in the production of the intermediate outputs gets measured. In the second stage, efficiency of each DMU in producing final outcomes

is determined using the intermediate outputs from the first stage. The general formulation for a two-stage DEA model is mentioned below:

equation-1

$$\hat{\phi}^{\mathrm{DEA}}(\mathbf{x}) = \max_{\lambda \in \Re_{+}^{n}} \left\{ \sum_{h=1}^{n} \lambda_h y_h \;\middle|\; \mathbf{x} \geq \sum_{h=1}^{n} \lambda_h \mathbf{x}_h;\ \sum_{h=1}^{n} \lambda_h = 1 \right\}$$

In the second stage, the following linear regression equation is estimated using OLS or ML

$$\ln \hat{\theta}_i^{\mathrm{DEA}} = \alpha + \mathbf{z}_i \boldsymbol{\delta} + \omega_i,\ i = 1, \ldots, n,$$ equation-2

where α is the intercept capturing the inefficiency as well as the finite sample bias of the DEA estimator, and (ω) i represents the noise term v of i and deviations from the expected inefficiency μ.

4. Results and Discussion

following section provides the results of DEA, Tobit regression and paired sample t-test. The study runs two models: the first is to inspect the effects on intangible assets of acquiring firms, and the second is to examine the effects on the financial performance of acquiring firms in the agri-industry of the emerging countries. In section 4.1, we provide the inputs and outputs for data envelopment analysis, while section 4.2 provides the descriptive statistics of the data that we collected for this study.

4.1 Inputs and Outputs for Data Envelopment Analysis

The data envelope analysis (DEA) is shown in Table 1, along with its inputs and results. DEA is a non-parametric tool for comparing the efficacy of different organizational or business decision-making units. Two parts make up the DEA model: the first part measures how well companies use their inputs and outputs, while the second part takes a look at how well they perform overall.

Table 1. Inputs and outputs for Data Envelopment Analysis

Input variables (first stage)	Description	Operationalization
	Intangible assets	Monetary value of intangible assets
	Customer relationship expenditure	receivable Yearly dollar amount of accounts receivables
	Marketing expenditures	Sales, general and administrative expenses
Output variables (first stage)	Sales	Sales turnover
	Inventory turnover	Cost of goods sold / total inventory
Output variable (second stage)	Firm performance	EBIT (earnings before interest and taxes) / total revenue

Table 1 depicts the initial phase using three input variables: The first is the monetary worth of intangible assets; the second is the intangible assets budget; and the third is the customer relationship budget, which is the annual amount of accounts receivable. Moreover, first, sales, which stand for sales turnover, and second, inventory turnover, which is determined by dividing total inventory by the cost of goods sold, have been established as output variables for this stage. Stepping into Stage 2, the table reveals a solitary output variable: firm performance, which is evaluated by dividing total revenue by EBIT (profits before interest and taxes). This metric takes into account a company's profitability in relation to its total sales and gives a thorough assessment of its financial performance. Acquiring companies in the agri-business sector in developing countries can have their intangible assets and overall performance measured in relation to the effects of cross-border M&A through the operationalization of input and output factors. In order to gain a deeper understanding of the interplay between post-acquisition inputs, outputs, and performance outcomes, we utilize these variables in the two-stage DEA analysis.

4.2 Mean Values of Inputs and Outputs

Table 2 presents mean values in USD million for a number of input and output variables spanning four time periods: the year before the merger (t—2), the year before the merger (t—1), the year after the merger (t+1), and the year after the merger (t+2).

Table 2. Mean Values of Inputs and Outputs

Mean of inputs and outputs (in USD million, except inventory turnover and EBIT margin)				
Input and output variables	Pre-merger year (t — 2)	Pre-merger year (t — 1)	Post-merger year (t þ 1)	Post-merger year (t þ 2)
Intangible assets	127.367	383.17	891.66	918.33
Customer relationship expenditure	691.70	851.02	1091.68	1409.82
Marketing expenditure	413.43	508.37	714.48	826.86
Sales	5524.27	5636.71	7449.87	8838.35
Inventory turnover	6.52	6.89	5.82	5.83
Firm performance (EBIT margin) (%)	17.5	20	18	-6.5

Intangible assets' average value rose from 127.367 USD million in the year before the merger (t—2) to 918.33 USD million in the year after the merger (t+2). The financial worth of intangible assets has grown substantially as a result of cross-border M&A, as indicated by this large increase. The mean expenditure on customer relationships has been on the rise after the merger, going from 691.70 million USD in the year before the merger (t—2) to 1409.82 USD in the year after the merger (t+2). It appears that there is an increasing emphasis on fostering customer ties post-merger. Intangible asset spending is on the rise as well, going from 413.43 million USD in the year before the merger (t—2) to 826.86 USD in the year after the merger (t+2). This points to a rise in marketing spending, which may be an effort to boost awareness of the acquired business. Sales have been on the rise, hitting 88,385 USD million in the second year after the merger (t+2). This shows that after the merger, sales for the merged company increased. There is a little decline in inventory turnover values between the years before and after the merger (t 2). This can be because of how sales or inventory management have changed since the merger.

There are changes in the EBIT margin, which is a measure of the performance of the firm. From 17.5% in the year before the merger (t—2) to 20% in the year before the merger (t—1), it falls to 18% in the year after the merger (t+1) and then collapses precipitously to -6.5% in the year after the merger (t+2). A negative EBIT margin in the second year after the merger (t+2) could indicate that there would be financial difficulties or losses.

4.3 Descriptive Statistics

The descriptive statistics provide an analysis of the alterations in crucial financial variables following the merger. The observed rise in intangible assets, customer relationship expenditure, and marketing expenditure could potentially signify deliberate investments aimed at achieving long-term strategic objectives. Table 3 presents the results of descriptive statistics.

Table 3: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Intangible assets Pre-merger	24	0.000	0.744	255.26	.236	-.034	.174	-.920	.458
Intangible assets Post-merger	24	0.015	0.855	280.37	.312	-.455	.199	-1.650	.515
Customer relationship expenditure. Pre-merger	24	0.001	1.389	701.36	.320	.152	.172	-.735	.458
Customer relationship expenditure. Post-merger	24	0.003	1.449	825.39	.389	.275	.216	-.840	.541
Marketing expenditure Pre merger	24	1.216	1.639	460.90	.079	-.162	.179	-.036	.458
Marketing expenditure Post-Merger	24	1.325	2.010	551.89	.081	-.210	.206	-.077	.563
Sales Pre-merger	24	1.239	2.445	5155.49	.340	.274	.267	-.111	.612
Sales post-merger	24	2.336	3.656	7335.55	.421	.325	.321	-.121	.679
Inventory Turnover Pre-merger	24	1.069	3.299	6.750	.488	.385	.263	-.192	.612
Inventory Turnover Post-Mercer	24	1.960	3.478	7.780	.535	.436	.359	-.222	.779
margin) Firm performance (EBIT margin)Pre-merger	24	1.229	1.669	19%	.087	-.255	.247	-.019	.612
Firm Performance Post-Merger	24	2.655	1.898	21%	.098	-.305	.381	-.039	.689

The intangible asset mean values, pre-merger and post-merger, give evidence of an increment in intangible assets values after the merger. Analogously, the worth of the customer relationship spending Pre-merger and post-merger demonstrates that the cost rises on the consumer relationships after the merger. They also indicate that marketing spending rose following the

merger. The average sales record had increased tremendously after the merger. We observed a slight bump in the inventory turnover in the first few months after merging. The mean firm performance (EBIT margin) in the post-merger period was by little. Thus, the descriptive data indicate that the merger has engendered growth in intangible assets, customer relationship expenditure and marketing expenditure, sales and firm performance.

4.4 Correlation Analysis

Next, Table 4 presents the results of the correlation prior to and after the mergers and acquisitions.

Table 4 Correlational analysis

	Intangible assets Pre-merger	Intangible assets Post-merger	Customer relationship expenditure. Pre-merger	Customer relationship expenditure. Post-merger	Marketing expenditure Pre merger	Marketing expenditure Post-Merger	Sales Pre-merger	Sales Post merger	Inventory Turnover Pre-merger	Inventory Turnover Post-merger	Firm performance (EBIT margin)Pre-merger	Firm Performance Post merger
Intangible assets Pre-merger	1											
Intangible assets Post-merger	0.572	1										
Customer relationship expenditure. Pre-merger	0.349	0.399	1									
Customer relationship expenditure. Post-merger	0.433	0.483	0.393	1								
Marketing expenditure Pre merger	0.65	0.71	0.61	0.357	1							
Marketing expenditure Post-Merger	0.685	0.735	0.645	0.574	0.884	1						
Sales Pre-merger	0.456	0.506	0.416	0.609	0.919	0.934	1					
Sales Post merger	0.635	0.685	0.595	0.38	0.69	0.71	0.775	1				
Inventory Turnover Pre-merger	0.271	0.321	0.231	0.559	0.869	0.912	0.354	0.529	1			

Inventory Turnover Post-merger	0.265	0.315	0.225	0.195	0.505	0.645	0.314	0.41	0.559	1		
Firm performance (EBIT margin)Pre-merger	0.747	0.797	0.707	0.189	0.499	0.555	0.745	0.766	0.633	0.51	1	
Firm Performance Post merger	0.896	0.946	0.856	0.671	0.981	0.991	0.876	0.932	0.564	0.61	0.891	1

Correlation analysis from table indicates the presence of the variable relations that are before and after the merger. In the first place, the variables with positive relations on the diagonal have the highest absolute values signifying the same variables before and after the merger. This infers a steady pattern between the values of the variables over the time. The non-diagonal coefficients give clues as to how different variables are connected among them. Thus, the results reveal a moderate positive correlation between intangible value pre- and post-merger, which implies that companies with more intangible assets can successfully maintain or even increase those assets' value after merger. The same correlation is found between customer relationship expenditure and marketing expenditure, a finding that is confirmed both before the merger and after the merger, indicative of investments in customer relationships being connected with higher marketing expenditure. Important to note is that sales figures are found to have inherently strong positive correlation with marketing expenditure, demonstrating that increased marketing tasks always lead to higher sales either before or after the merger. Moreover, there have been significant and positive correlations between firm financial metric indicators (EBIT margin) pre-and post-merger, which means that the firms with strong pre-merger performance have a sustained or improved performance post-merger. Hence, these correlation coefficients offer us useful evidence of the way different factors are influencing the deal, which let out merely the patterns and trends in the data.

4.5 Sample t-test

The results of the paired sample t-tests, as displayed in Table 5, demonstrate a comparison of the means for different input and output variables during the pre-merger and post-merger periods. The table presents the pre-merger mean, post-merger mean, and the t-statistic along with its associated p-value.

Table 5 Paired sample t-test

Input and output variables	Pre-merger mean	Post-merger mean	*T* (sig)
Intangible assets	255.26	931.05	—2.88 (.009)
Customer relationship expenditure	701.36	1145.25	—2.738 (.01)
Marketing expenditure	460.90	770.67	—3.60(.001)
Sales	5155.49	7489.11	—2.77(.01)
Inventory Turnover	6.75	5.77	1.98(.05)
Firm performance (EBIT margin)	19%	6%	1.08(.28)

Note: Sig are the *p* values. $p < 0.05$: Significant at the 5% level. $p < 0.01$: Significant at the 1% level. $p < 0.001$: Significant at the 0.1% level.

The average value of intangible assets exhibited a substantial rise from the period prior to the merger (255.26) to the period following the merger (931.05), as evidenced by the negative T value (-2.88) and a statistically significant p-value of.009. These findings indicate a statistically substantial enhancement in the financial worth of intangible assets subsequent to cross-border M&A. The analysis reveals that there was a statistically significant rise in the mean customer relationship spending from the pre-merger era (mean = 701.36) to the post-merger period (mean = 1145.25), as indicated by a T value of -2.738 and a p-value of.01. This indicates a significant increase in annual spending on client connections subsequent to the acquisitions. The analysis of marketing expenditures revealed a noteworthy increase in the mean value from the period prior to the merger (460.90) to the period following the merger (770.67). This finding is supported by a statistically significant T value of -3.60 and a p-value of.001. This implies a significant rise in financial investment in intangible asset endeavors following the acquisition. There was an increase in sales turnover after the merger compared to before the merger. The data showed a rise from 5155.49 to 7489.11 with a T value of 2.77 and a p value of.01 indicating significance. This suggests that the cross-border M&A had an impact on revenue generation. When it comes to inventory turnover, there was a decrease in the turnover rate following the merger. The mean value dropped from 6.75 before the merger to 5.77 after, which was found to be statistically significant with a T value of 1.98 and a p value of.05. This indicates that there might have been changes in inventory management effectiveness following the acquisitions. However, there wasn't a difference in firm performance as measured by EBIT margin between the periods before (19%) and after (6%) the merger. The T value was 1.08 and the p value was 0.28, suggesting that there weren't any alterations in EBIT margin after cross-border M&A. In conclusion, while there were changes in sales turnover and inventory turnover following the mergers, there weren't any statistically meaningful alterations observed in EBIT margin post-cross-border M&A.

Mergers and acquisitions (M&A) have been widely studied to ascertain their influence on the financial performance of firms. The impact of M&A on the financial performance is mixed according to research. For instance, some studies, like that by Haakantu & Phiri, (2022), have evidenced enhancement in financial performance after M&A while others, such as Ahmed et al.

(2018), found that there are insignificant improvements in financial ratios post M&A; however, poor profitability and efficiency were found. Further, Musah et al. (2020) failed to prove beyond doubt that M&A had positive effects on bank financial performance.

4.6 Intangible Assets capability under the Constant Returns to Scale model, DEA window analysis (first stage)

To get the Intangible assets capacity scores, the table 6 shows information from the Constant Returns to Scale model that was used with Data Envelopment Analysis (DEA) window analysis at the beginning.

Table 6. Intangible Assets capability

	Intangible Assets Capability score			
	Pre-merger years		Post-merger years	
	$t-2$	$t-1$	$t+1$	$t+2$
Mean	0.4074	0.4351	0.4604	0.6262
Standard deviation	0.2951	0.2701	0.2771	0.2880
Min.	0.11	0.14	0.12	0.04
Max.	1	1	1	1
No. of efficient decision making units (M&As)	6	5	5	7
No. of inefficient decision making units (M&As)	18	19	19	17

$p < 0.05$: Significant at the 5% level. $p < 0.01$: Significant at the 1% level. $p < 0.001$: Significant at the 0.1% level.

The average intangible assets capacity score exhibits a rising pattern from the pre-merger periods (0.4074 and 0.4351) to the post-merger periods (0.4604 and 0.6262). This finding implies that acquiring firms experience enhanced Intangible Assets capabilities as a result of engaging in cross-border M&A. Standard deviation quantifies the level of diversity within Intangible Assets competency ratings. The investigated periods show a drop in standard deviation, particularly from 0.2951 to 0.2880. This decline indicates a reduction in the variability of Intangible Assets capacities among acquiring businesses. Consequently, it suggests the possibility of a convergence in Selling and Intangible Assets efficiency.

The inclusion of minimum and maximum Intangible Assets capacity scores offers valuable insights into the various levels of operational effectiveness observed within the sample. The observed scores span a range of 0.11 to 1, suggesting that certain organizations exhibited notable enhancements in Intangible assets competence while others consistently maintained a high level of efficiency during the analyzed time periods. The quantity of efficient Decision Making Units (DMUs), which signifies instances of mergers and acquisitions where Intangible assets capability was optimized, exhibits some degree of variability throughout the periods but maintains a

generally consistent level. The post-merger year (t + 2) has the greatest number of efficient DMUs, with 7 out of the total 25 enterprises.

Our findings are consistent with those of Altunbas Boloupremo & Ogege (2019) who stated that mergers among banks with geographical or product relatedness can add value to the banks by improving the profitability especially when the merging banks maintain consistency in their efficiency and deposit strategies. Likewise, Aggarwal & Garg (2019) also were able to show that post-merger banks demonstrate better performance caused by higher ability to attract loans and deposits, as well as employee productivity.

4.7 Intangible Assets capability under the Constant Returns to Scale model, DEA window analysis (first stage)

To get the Intangible assets capacity scores, table 4 shows information from the Constant Returns to Scale model that was used with Data Envelopment Analysis (DEA) window analysis at the beginning.

Table 7. Intangible Assets capability

	Intangible Assets Capability score			
	Pre-merger years		Post-merger years	
	t — 2	*t* — 1	*t* þ 1	*t* þ 2
Mean	0.4074	0.4351	0.4604	0.6262
Standard deviation	0.2951	0.2701	0.2771	0.2880
Min.	0.11	0.14	0.12	0.04
Max.	1	1	1	1
No. of efficient decision-making units (M&As)	6	5	5	7
No. of inefficient decision-making units (M&As)	18	19	19	17

$p < 0.05$: Significant at the 5% level. $p < 0.01$: Significant at the 1% level. $p < 0.001$: Significant at the 0.1% level.

The average Intangible Assets capacity score exhibits a rising pattern from the pre-merger periods (0.4074 and 0.4351) to the post-merger periods (0.4604 and 0.6262). This finding implies that acquiring firms experience enhanced Intangible Assets capabilities as a result of engaging in cross-border M&A. Standard deviation quantifies the level of diversity within Intangible Assets competency ratings. The investigated periods show a drop in standard deviation, particularly from 0.2951 to 0.2880. This decline indicates a reduction in the variability of Intangible Assets capacities among acquiring businesses. Consequently, it suggests the possibility of convergence in Selling and Intangible Assets efficiency.

The inclusion of minimum and maximum intangible asset capacity scores offers valuable insights into the various levels of operational effectiveness observed within the sample. The observed

scores span a range of 0.11 to 1, suggesting that certain organizations exhibited notable enhancements in intangible asset competence while others consistently maintained a high level of efficiency during the analyzed time periods. The quantity of decision-unit making units (DMUs), which signifies instances of mergers and acquisitions where intangible asset capability was optimized, exhibits some degree of variability throughout the periods but maintains a generally consistent level. The post-merger year (t + 2) has the greatest number of efficient DMUs, with 7 out of the total 25 enterprises.

Our findings are consistent with those of Altunbas Boloupremo & Ogege (2019), who stated that mergers among banks with geographical or product-related characteristics can add value to the banks by improving profitability, especially when the merging banks maintain consistency in their efficiency and deposit strategies. Likewise, Aggarwal & Garg (2019) were also able to show that post-merger banks demonstrate better performance caused by their higher ability to attract loans and deposits, as well as employee productivity.

4.8 Results of Tobit regression

Table 8 displays the outcomes of a Tobit regression analysis, a frequently employed method when the dependent variable is subject to censorship or truncation.

Table 8: Results of Tobit regression

Constant (a)	0.1676702***
Pre-merger Intangible assets capability	0.7466769***
No. of observations	24
No. of left-censored observations	0
No. of observations (right-censored)	3
Log likelihood	13.671428
Chi-square	33.16***
Pseudo R^2	2.6442

***$p < 0.01$.

The constant a represents the estimated intercept when the independent variable, pre-merger Intangible assets capability, is set to zero. With a p-value less than 0.01, the constant in this Tobit regression is 0.1676702. Even in the absence of any Intangible Assets competence prior to the merger, the constant in this Tobit regression of 0.1676702 suggests a positive effect on the dependent variable (possibly firm performance) with a p-value less than 0.01. Pre-merger Intangible Assets capabilities had a statistically significant coefficient of 0.7466769 at $p < 0.01$. While all other factors remain the same, this means that the dependent variable (i.e., firm performance) increases by 0.7466769 units for every one unit rise in pre-merger Intangible assets capabilities. We used twenty-four observations to run the Tobit regression, ensuring a statistically valid sample.

The analysis does not contain any left-censored observations, which means that no firms have unobserved values below a specific threshold. Three observations suggest that certain firms' values exceed the upper limit of the dependent variable, resulting in right-censoring. The maximum likelihood, given the observed data, is represented by the log likelihood, which is 13.671428. The goodness-of-fit and model comparison processes make use of it. At $p < 0.01$, there is statistical significance with a chi-square score of 33.16. This bodes well for the overall model's statistical significance, suggesting that some independent variable is making a substantial contribution to it. The percentage of the dependent variable's variation explained by the model is 2.6442, which is the pseudo-R2. Pseudo R2 should be interpreted with care; however, a larger number usually means a better fit with the model. According to the Tobit regression results, pre-merger intangible assets competence significantly affects the dependent variable, likely firm performance. According to the positive coefficient, organizations with stronger pre-merger intangible assets capabilities typically have greater performance. All things considered, the model makes a meaningful contribution to explaining the dependent variable's variation, as shown by the statistically significant chi-square value and low p-value.

Zelalem & Abebe (2022) reveal that companies paying higher prices for others' assets that are not tangible contribute to the notion that intangible assets are of more significant worth to M&A firms. This is due to the fact that buyers in the selling process of this asset put a great deal of value on intangible assets. Besides, Su and Wells (2014) establish the absence of a direct relationship between tangible assets that can be acquired in M&A activity and long-term business performance of the purchasing entity, indicating the intricate and complicated nature of other intangible assets.

According to Aitaa & Mabel (2023), there are explanations regarding the banking sector of Nigeria, indicating that a mighty increase in capital assets after mergers and acquisitions led to an increased return on assets. Highlighting the crux of the matter is that the proper management of intangible assets as such has a great impact on enhancing financial performance. Besides, the Kenyan commercial banks M&A translate into improved return on assets and liquidity (Mbuthia 2021). However, the mergers do not bring huge changes to capital adequacy and asset quality. It implies that the M&A operations of Kenyan commercial banks have a subtle influence over key financial indicators.

4.9 Firm Performance

Table 9 presents information on firm performance through data Envelopment analysis by using its window analysis technique for the second stage, with a focus on mergers and acquisitions (M&A).

Table 9: Pre- and Post-merger firm performance

	Firm performance			
	Pre-merger years		Post-merger years	
	$t-2$	$t-1$	$t+1$	$t+2$
Mean	0.2263	0.2832	0.3619	0.3787
Standard deviation	0.2841	0.3559	0.3637	0.3178
Minimum	0.0100	0.0000	0.0000	0.0000
Maximum	1	1	1	1
Number of efficient decision-making unit (M&As)	3	5	7	6
Number of inefficient decision-making unit (M&As)	21	19	17	18

Based on the years before the merger (0.2263 and 0.2832) and the years after the merger (0.3619 and 0.3787), the mean performance of the firms increases. This data reveals that after the cross-border M&A, the overall performance of the firms enhanced. The standard deviation measures the dispersion of firm performance scores. The declining trend in standard deviation during the examined periods (from 0.2841 to 0.3178) suggests a possible convergence in overall performance, indicating a decrease in the variability of firm performance among acquiring firms. The minimum and maximum firm performance scores offer valuable insights into the span of efficiency observed within the sample. The scores vary between 0 and 1, denoting a wide variety of performance results among acquiring firms. In the year following the merger (t + 1), the number of efficient DMUs, which refers to mergers and acquisitions where company performance was optimized, increased from 3 to 7, indicating a general enhancement in the effectiveness of acquiring businesses. This indicates a general enhancement in the effectiveness of acquiring businesses. The number of underperforming DMUs, which suggests potential for improved business performance through mergers and acquisitions, experienced a modest decline in the years after the merger. This suggests a decrease in the number of businesses encountering below-optimal performance.

The DEA window analysis conducted in the second stage shows that cross-border M&A in the agri-business sector of emerging markets have enhanced the overall performance of firms, as indicated by a favorable trend in average performance. The decrease in standard deviation indicates a shift towards greater consistency in performance efficiency among acquiring businesses. The distribution of effective and ineffective DMUs offers additional understanding of the differences in business performance improvements, suggesting an extensive favorable influence of cross-border M&A transactions on the overall performance of acquiring firms. The rise in the quantity of proficient DMUs indicates that a greater percentage of companies attain optimal performance efficiency after acquisition. These findings enhance our comprehension of the ever-changing connection between cross-border M&A and the performance of businesses operating in the emerging agri-business sector.

4.10 Tobit Regression

Table 10 shows the outcomes of a Tobit regression study where the dependent variable is potentially affected by censorship or truncation.

Table 10: Results of Tobit regression

Constant (*a*)	0.1786203
Pre-merger Intangible Assets capability	1.287255***
Number of observations	24
No. of left-censored observations	0
No. of right-censored observations	3
Log likelihood	4.4568665
Chi-square	33.85***
Pseudo R^2	0.7978

***$p < 0.01$.

The estimated intercept where the independent variable (pre-merger intangible asset capability) is zero is represented by the constant (a). The constant represents the predicted value of the dependent variable in this Tobit regression when the independent variable is set to zero, which is 0.1786203. Pre-merger intangible asset capability has a statistically significant coefficient of 1.287255*** at $p < 0.01$. When all other factors remain the same, this means that the dependent variable increases by 1.287255 units for every one unit rise in the capability of intangible assets prior to the merger. We used twenty-four observations to run the Tobit regression and achieve statistical significance. The analysis did not find any left-censored observations, indicating that no firms had unobserved values below a specific threshold. Three observations suggest that certain companies' values exceed the upper limit of the dependent variable, resulting in right-censoring. The maximized likelihood function based on the observed data is 4.4568665. Researchers use this tool to compare models and evaluate goodness-of-fit. A chi-square value of 33.85 at $p < 0.01$ indicates statistical significance. At least one independent variable is making a substantial contribution to the model, since the whole model is statistically significant. The percentage of the dependent variable's variance that can be explained by the model is 0.7978, which is the value of the pseudo-R2. A better model fit is typically indicated by a higher value. According to the findings, before a merger takes place, a company's capacity to use its intangible assets has a significant impact on how well it does in the agri-business sector of developing economies.

5. Conclusion and Recommendations

The present study analyzes the impact of cross-border mergers and acquisitions on intangible assets and overall firm performance in the agri-business sector of emerging markets. This research, driven by specific assumptions, has uncovered interesting findings that reveal the diverse outcomes of these valuable endeavors. Apparently, there has been a dramatic increase in cross-border M&A activity since the rise of globalization, which has altered the agri-business landscape. The research,

which relied on a robust methodology utilizing data envelopment analysis (DEA) and the Tobit regression model, uncovered numerous noteworthy patterns and relationships.

Our findings confirm the first hypothesis that there would be a general enhancement in the financial performance of businesses in emerging countries after acquiring a firm from a developed country. The analysis uses two stages DEA demonstrates a pattern in the performance of the company, indicating a general improvement following the acquisition. The Tobit regression analysis further highlights the impact of merger intangible asset capabilities on the company's performance. Moreover, this study delves into the complexities surrounding competence in assets. The result reveals that average scores have been steadily increasing since the acquisition took place. The DEA window analysis enhances the understanding of the complex interplay between inputs, outputs, and performance outcomes, highlighting its beneficial effect on acquiring businesses' intangible assets efficiency. The second hypothesis posited that acquiring a firm strengthens the intangible assets of businesses in emerging countries. Our findings confirm the hypothesis, which is further supported by the outcomes of the Tobit regression. Pre-merger intangible asset competency is a vital factor that greatly impacts the performance of a firm. The correlation between intangible assets and post-acquisition success highlights the crucial importance of intangible assets in driving such success.

Even though there are overall positive trends, it is important to note that each firm is unique. The fact that efficiency scores can vary widely, both in terms of intangible assets and overall firm performance, highlights the importance of adopting a specialized approach when attempting to comprehend the results of global acquisitions and mergers. Notably, some firms continue to carry out operations at levels that are below ideal, which indicates the existence of issues requiring a deeper look. With the purpose of providing empirical insights into the specific context of cross-border M&A in the agri-business sector within emerging markets, this study makes a contribution to the existing body of literature. In addition to providing a framework for informed decision-making and future research endeavors, the findings have implications for practitioners, politicians, and academics alike.

The results conclude that cross-border M&A have the ability to bring about significant change in the agribusiness sector of emerging nations. As companies deal with the challenges of globalization, they realize that strategic pursuit of intangible assets and development of Intangible assets skills become key factors in their success after an acquisition. The intention of this study is to act as a stepping stone, inviting further analysis and refining of methods to exploit the full potential of cross-border M&A in the dynamic landscape of emerging market agribusiness.

Businesses that are involved in mergers and acquisitions that span international borders should make the evaluation and improvement of their intangible assets a strategic priority. The evaluation of intellectual property, brand value, and other intangible assets are the suggested variables. In light of the growing trend in intangible assets capability following acquisitions, businesses ought to make investments in the focused growth of their intangible assets capabilities. Recognizing the

dynamics of the market is crucial for tailoring intangible assets to the tastes of local customers in both developing and developed countries engaged in mergers and acquisitions.

In order to sustain good growth and innovation in the agribusiness activities of emerging markets, decision makers should, first and foremost, consider implementing programs and measures that ensure sustainable practices, facilitate knowledge transfer, and improve access to financing. Along with these, governments are in a position to organize legal structures that will encourage environmentally friendly practices while ensuring that M&A agreements are in tune with the goals of being socially responsible. By fostering partnerships between the acquisition firms and the local institutions, knowledge sharing and innovation will be further promoted, capable of letting agro-businesses adopt more sustainable practices and adapt better to the unexpected circumstances that come about.

Moreover, policymakers should concentrate on reinforcing the regulatory governance of the markets, incorporating the process of market access, investing in infrastructural development, and creating a connected platform friendly to cross-border M&A deals. Transparency and fair competition, as well as representation of local interests, are major aims of strengthening regulatory oversight, which in turn improves investors' reliability. Through fostering market access and trade channel conditions, governments stimulate major development for agricultural companies as a salary prospect for people in rural areas. Investment in supporting infrastructure at the rural scale, such as transportation networks and facilities for cold storage, can help synergy in agricultural business, increasing efficiency and competitiveness; thus, firms could be active players in cross-border M&A and the development of sustainable economic development.

This study is limited to a small sample size of 25 companies from the agriculture sector of emerging economies because the available data is of tiny quantity, keeping in view the objective of this study. This sample size may ignore some external factors that may influence the observed outcomes. Therefore, future studies can expand the sample size and include some other externalities in the study.

For the purpose of monitoring the performance of cross-border agribusiness M&A over time, researchers can take into consideration conducting longitudinal studies. This could assist in building theoretical frameworks and guidelines for strategy by revealing the sustainability and long-term impact of these strategic undertakings. Companies that continue to operate below the desired standards after the acquisition must implement capacity-building strategies. For the purpose of assisting businesses in overcoming challenges and making the most of the possibilities for cross-border M&A, this may involve targeted support, training, and resources.

Acknowledgement

There is no funding available for this manuscript.

Data Availability

Data can be available upon request.

Conflict of Interest

Author does not have any conflict of interest.

References

Abbas, Q., Saeed, R., Ehsan Ul, H., & Ijaz, M. (2014). Analysis of Pre and Post Merger and Acquisition Financial Performance of Banks in Pakistan. *Information Management and Business Review*. doi: 10.22610/imbr.v6i4.1113

Aggarwal, P. and Garg, S. (2019). Impact of mergers and acquisitions on accounting-based performance of acquiring firms in India. Global Business Review, 23(1), 218-236. https://doi.org/10.1177/0972150919852009

Ahmed, F., Manwani, A., & Ahmed, S. (2018). Merger & acquisition strategy for growth, improved performance and survival in the financial sector. Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah, 5(4), 196-214. https://doi.org/10.22437/ppd.v5i4.5010

Aitaa, S. K., & Mabel, O. O. (2023). An Exploration of the Impact of Mergers and Acquisitions in the Nigerian Banking Sector: A Study of Access Bank and Diamond Bank. *International Journal of Business Strategies*. doi: 10.47672/ijbs.1337

Albert, M. G., & Maudos, J. n. (2022). The Importance of Intangible Assets in Regional Economic Growth: A Growth Accounting Approach. *The Annals of Regional Science*. doi: 10.1007/s00168-022-01138-6

Annosi, M. C., Brunetta, F., Capo, F., & Heideveld, L. (2020). Digitalization in the Agri-Food Industry: The Relationship Between Technology and Sustainable Development. *Management Decision*. doi: 10.1108/md-09-2019-1328

Bajgai, G., & Pradhan, R. (2021). An Assessment of Financial Performance and Service Facility Improvement After Merger and Acquisition of Financial Institutions of Nepal. *International Research Journal of MMC*. doi: 10.3126/irjmmc.v2i2.38144

Barel-Shaked, S. (2023). Network-Based Business Model In the Agri-Food Sector: A case Study Of Green Fingers. *Agricultural Economics (Zemědělská Ekonomika)*. doi: 10.17221/2/2023-agricecon

Bhagat, S., Malhotra, S., & Zhu, P. (2011). Emerging country cross-border acquisitions: Characteristics, acquirer returns and cross-sectional determinants. *Emerging markets review, 12*(3), 250-271.

Binh, Q. M. Q., Hà, N. M., & Trang, N. T. H. (2020). Application of an Intangible Asset Valuation Model Using Panel Data for Listed Enterprises in Vietnam. *Investment Management and Financial Innovations*. doi: 10.21511/imfi.17(1).2020.26

Boloupremo, T., & Ogege, S. (2019). Mergers, Acquisitions and Financial Performance: A Study of Selected Financial Institutions. *Emaj Emerging Markets Journal*. doi: 10.5195/emaj.2019.162

Filipovic, Z. (2019). The Intangibles Song in Takeover Announcements: Good Tempo, Hollow Tune. *SSRN Electronic Journal*. doi: 10.2139/ssrn.3330623

Gachigo, J., Ondigo, H., Aduda, J., & Onsomu, Z. (2022). The Effect of Mergers and Acquisitions Strategies on Financial Performance of Commercial Banks in Kenya. *European Scientific Journal Esj*. doi: 10.19044/esj.2022.v18n25p110

Gill, A., Mand, H. S., Obradovich, J. D., & Mathur, N. D. (2018). The Impact of Financial Support From Non-Resident Family Members on the Financial Performance of Newer Agribusiness Firms in India. *Journal of Agribusiness in Developing and Emerging Economies*. doi: 10.1108/jadee-04-2016-0022

Gombár, M., Širá, E., Hečková, J., Pisar, O., Chapčáková, A., & Kaščáková, D. R. (2022). Cross-Border Mergers and Acquisitions in Manufacturing Sector in the European Area. *Journal of Entrepreneurship and Sustainability Issues*. doi: 10.9770/jesi.2022.10.2(7)

Haakantu, M., & Phiri, J. (2022). Effects of Mergers and Acquisitions on the Financial Performance of Commercial Banks in Developing Countries—A Case of Zambia. *Open Journal of Business and Management*. doi: 10.4236/ojbm.2022.106155

Hakimi, R., Noer, M., Nofialdi, N., & Hasnah, H. (2020). Network Structure of Institutions in Cassava Agro-Industry Development in Lima Puluh Kota District. *International Journal on Advanced Science Engineering and Information Technology*. doi: 10.18517/ijaseit.10.2.10750

Hečková, J., Chapčáková, A., & Litavcová, E. (2016). Economic Integration and Its Influence on Cross-Border Mergers and Acquisitions Within the European Area. *Politická Ekonomie*. doi: 10.18267/j.polek.1052

Jin, X., & Hu, B. (2018). Internal Control, Cross-Border Mergers, Cultural Integration and Merger Performance. doi: 10.2991/mshsd-17.2018.59

Karim, R., Meem, M. A., Rahman, M. S., Noman, M. R. F., & Huda, S. (2020). Use and Role of Mobile Phone for Information Services in Agricultural Activities. *Asian Journal of Agricultural Extension Economics & Sociology*. doi: 10.9734/ajaees/2020/v38i230316

Katchova, A. L., & Enlow, S. J. (2013). Financial Performance of Publicly-traded Agribusinesses. *Agricultural Finance Review*. doi: 10.1108/00021461311321311

Kimouche, B. (2022). Intangible Assets, Goodwill and Earnings Management: Evidence From France and the Uk. *Folia Oeconomica Stetinensia*. doi: 10.2478/foli-2022-0006

Liu, H. (2022). Influencing Factors and Risk Control in Cross-Border Mergers and Acquisitions. doi: 10.2991/978-94-6463-052-7_90

Liu, Y., & Woywode, M. (2013). Light-touch integration of Chinese cross-border M&A: the influences of culture and absorptive capacity. *Thunderbird international business review*, *55*(4), 469-483.

Lobanova, J. Z., Kračun, D., & Kavkler, A. (2018). Institutions as a Mediator of the Effect of Crossborder Mergers &Amp; Acquisitions on Domestic Investment. *Prague Economic Papers*. doi: 10.18267/j.pep.665

Lopes, F. C., & Carvalho, L. (2021). Intangible Assets and Business Performance in Latin America. *Rausp Management Journal*. doi: 10.1108/rausp-02-2020-0024

Martos-Pedrero, A., Castillo, D. J., Ferrón-Vílchez, V., & Cortés-García, F. J. (2022). Corporate Social Responsibility and Export Performance Under Stakeholder View: The Mediation of Innovation and the Moderation of the Legal Form. *Corporate Social Responsibility and Environmental Management*. doi: 10.1002/csr.2352

Mbuthia, W. (2021). Mergers and acquisitions and the effect on financial performance of commercial banks in kenya. Journal of Finance and Accounting, 5(2), 103-127. https://doi.org/10.53819/81018102t4009

Musah, A., Abdulai, M. S., & Baffour, H. (2020). The effect of mergers and acquisitions on bank performance in ghana. Asian Journal of Economics and Empirical Research, 7(1), 36-45. https://doi.org/10.20448/journal.501.2020.71.36.45

Ogendo, J. L., & Ariemba, J. (2022). Mergers and Acquisitions for Business Sustainability in Emerging Markets During a Vague Era: A Literature Analysis. *Ad-Minister*. doi: 10.17230/ad-minister.41.2

Perwito, P., Nugraha, N., Gisman, G., & Gunardi, G. (2021). Intangible Asset Moderation and the Sustainable Investment and Firm Value Relation. doi: 10.4108/eai.18-11-2020.2311719

Rahman, M., Lambkin, M., & Hussain, D. (2016). Value creation and appropriation following M&A: A data envelopment analysis. *Journal of Business Research, 69*(12), 5628-5635.

Rao-Nicholson, R., & Khan, Z. (2017). Standardization Versus Adaptation of Global Intangible assets Strategies in Emerging Market Cross-Border Acquisitions. *International Intangible assets Review*. doi: 10.1108/imr-12-2015-0292

Rastić, A., Stevanović, T., & Antić, L. (2021). Intangible Assets Impact on Sustainable Growth Rate of Enterprises in the Republic of Serbia. *Facta Universitatis Series Economics and Organization*. doi: 10.22190/fueo210617027r

Roopesh, R., & Sandhya, S. (2022). Will Mergers and Acquisition Vacillate the Performance of Banks? A Case Study of Public Sector Banks in India. *Binus Business Review*. doi: 10.21512/bbr.v13i2.7928

Singla, R., Saini, A., & Sharma, R. (2012). Cross-Border Mergers and Acquisitions: A Performance Evaluation of Indian Acquiring Companies. *Asia-Pacific Journal of Management Research and Innovation*. doi: 10.1177/2319510x1200800205

Su, W. and Wells, P. (2014). The association of identifiable intangible assets acquired and recognised in business acquisitions with postacquisition firm performance. Accounting &Amp; Finance, 55(4), 1171-1199. https://doi.org/10.1111/acfi.12086

Sule, B. A., Datsu, J. B., Abubakar, S., & Tauheed, L. (2021). Farmer's Perception of the Effectiveness of Information and Communication Technologies in Dissemination of Agricultural Information to Rural Farmers in Niger State, Nigeria. *Journal of Agripreneurship and Sustainable Development*. doi: 10.59331/jasd.v4i1.191

Trejo-Pech, C. O., Gunderson, M. A., & Lambert, D. M. (2021). Mergers and Acquisitions in the U.S. Agribusiness Sector, 1990–2017. *Agribusiness*. doi: 10.1002/agr.21695

Tripathi, V., & Lamba, A. (2015). What Drives Cross-Border Mergers and Acquisitions? *Journal of Strategy and Management*. doi: 10.1108/jsma-05-2015-0040

Ye, J., & Zou, S. (2021). On Risk Control Strategy of Cross-Border Mergers and Acquisitions of Chinese Enterprises. doi: 10.2991/aebmr.k.210712.026

Zelalem, B. A., & Abebe, A. A. (2022). Does Intangible Assets Affect the Financial Performance and Policy of Commercial Banks' in the Emerging Market? *Plos One*. doi: 10.1371/journal.pone.0272018

Zhang, Y., Wu, X., Zhang, H., & Lyu, C. (2018). Cross-Border M&A and the Acquirers' Innovation Performance: An Empirical Study in China. *Sustainability*. doi: 10.3390/su10061796

Competing interests

The author(s) declare no competing interests.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethical Approval

This article does not contain any studies with human participants performed by any of the authors.

Informed Consent

This article does not contain any studies with human participants performed by any of the authors.