

**IMPACT OF MERGERS AND ACQUISITIONS ON FINANCIAL
PERFORMANCE: EVIDENCE FROM THE MICROFINANCE INDUSTRY OF
NEPAL**

**A Research Dissertation Submitted to
Kathmandu University School of Management
in partial fulfillment of the requirement for the
Degree of Master of Philosophy (MPhil) in Management**

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**Kathmandu Nepal
March, 2026**

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DECLARATION

I, hereby, declare that this dissertation entitled “*Impact of Mergers and Acquisitions on Financial Performance: Evidence from the Microfinance Industry of Nepal*”, is my original research work which I carried out in partial fulfillment of the requirements for the degree of Master of Philosophy (MPhil) in Management at Kathmandu University School of Management. I acknowledge that this dissertation has not been submitted for candidature for any other degree.

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Krishna Hari Baral

March, 2026

RECOMMENDATION

This is to certify that Mr. Krishna Hari Baral has completed his research work on *Impact of Mergers and Acquisitions on Financial Performance: Evidence from the Microfinance Industry of Nepal* under my supervision. His dissertation covers the result of his investigation conducted during the period he worked as an MPhil candidate for the School of Management. The dissertation meets the standard expected of a candidate for the degree of MPhil in Management and has been prepared in the prescribed format of the School of Management. The dissertation is forwarded for evaluation.

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RESEARCH COMMITTEE APPROVAL

We have conducted the viva-voce examination of the dissertation titled “*Impact of Mergers and Acquisitions on Financial Performance: Evidence from the Microfinance Industry of Nepal*” submitted by Krishan Hari Baral. We found the dissertation to be original work of the candidate and written according to the prescribed format of the School of Management. We approve the dissertation as the partial fulfillment of the requirements for the degree of Master of Philosophy (MPhil) in Management.

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ACKNOWLEDGEMENTS

I would like to sincerely thank my thesis supervisor and Dean of the School of Management, Prof. Dr. Bijay K.C., for his valuable guidance and motivation throughout this research. His advice and support helped me complete this study. I am equally thankful to Prof. Dr. Devi Bidari for his motivation.

I would also like to sincerely thank Asst. Prof. Dr. Umesh Rajopadhyaya (Subedi)— Coordinator of the Research Degree program—for his coordination, and help. I am also grateful for receiving direct or indirect support from my colleagues.

My friends, university officials, and evaluators inspired, supported, and helped me to accomplish this research task. My gratitude to them. I have received regular encouragement from my family members, throughout my academic career, and for this research work as well, so I am thankful to them. I am happy that my daughter, Kesina Baral, has an answer now, to her question why it took so long to complete my MPhil degree.

Finally, I am indebted to the Kathmandu University community, particularly KUSOM, for providing me with this opportunity to complete my MPhil. They have supported me throughout. They were available in my academic work needs. I appreciate their kindness, and encouragement throughout my MPhil journey.

Krishna Hari Baral

March, 2026

ABSTRACT

This study examines the impact of mergers and acquisitions (M&As) on the financial performance of microfinance institutions (MFIs) in Nepal. Minimum paid-up capital requirement limit set by Nepal Rastra Bank (NRB), which prompted M&As among MFIs, is the policy event for this research. M&As among MFIs increased highly after 2020Q1. The research uses a quasi-experimental research design, under a natural setting, and a Difference-in-Differences (DiD) fixed-effects model for estimation. A quarterly unbalanced panel dataset from 2017Q3 to 2024Q4 is used. Secondary data are sourced from NRB reports, audited financial statements of MFIs, and other official sources. The sample contains 60 MFIs with 1,621 observations, after dropping four wholesale MFIs. Financial performance is measured using profitability (ROA and ROE), efficiency & productivity (loan portfolio per staff), sustainability (debt-to-equity ratio), and loan portfolio specific growth (loan portfolio growth and borrower growth). The DiD model controls for age, inflation, interest rates, remittance, and the COVID-19 shock.

The study uses descriptive and correlation analysis, tests of parallel trends, model selection tests, and post-estimation checks. Heteroskedasticity, serial correlation, and cross-sectional dependence are handled using Driscoll-Kraay standard errors. The findings show that M&As significantly improve profitability, efficiency & productivity, and financial sustainability of merged MFIs, but the impact on loan growth and outreach is insignificant. These results support the efficiency theory of M&As, which says that M&As create benefits through synergy effects, which in this study are reflected in improved financial performance. The main limitation of the study is the difference in the timing of mergers across MFIs.

Keywords: Difference-in-Differences, Impact Evaluation, Merger and Acquisition, Performance

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LIST OF ABBREVIATIONS

A.D.	=	Anno Domini
ATT	=	Average Treatment effect on the Treated
BAFIA	=	Bank and Financial Institutions Act
BFIIs	=	Bank and Financial Institutions
BOKL	=	Bank of Kathmandu Limited
B.S.	=	Bikram Sambat
CAR	=	Capital Adequacy Ratio
CEOs	=	Chief Executive Officers
CETA	=	Cash Equivalent to Total Assets
chi2 or Chi2	=	Chi- Square (χ^2)
CRAR	=	Capital to Risk-Weighted Assets Ratio
CSR	=	Corporate Social Responsibility
CV	=	Coefficient of Variation
DE or D/E	=	Debt to Equity Ratio
DF or df	=	Degrees of Freedom
DiD	=	Difference-in-Differences
DPS	=	Dividends Per Share
EPS	=	Earnings Per Share
FIs	=	Financial Institutions
GBLBS	=	Grameen Bikas Laghubitta Sanstha Limited
INGOs	=	Internal Non-Government Organizations
ITA	=	Investments to Total Assets Ratio
Max	=	Maximum

M&As	=	Mergers and Acquisitions
MFI	=	Microfinance Institutions
Min	=	Minimum
MPS	=	Market Price Per Share
NBL	=	Nepal Bank Limited
NGOs	=	Non-Government Organizations
NIM	=	Net Interest Margin
NPA	=	Non-performing Asset
NPLTL	=	Non-Performing Loans to Total Loans
NRB	=	Nepal Rastra Bank
NRs	=	Nepalese Rupees
P/E	=	Price Earnings Ratio
PRVU	=	Prabhu Bank
ROA	=	Return on Asset
ROE	=	Return on Equity
SD	=	Standard Deviation
SDGs	=	Sustainable Development Goals
SME	=	Small and Medium-sized Enterprises
SWOT	=	Strength Weakness Opportunity and Threat
TLOTD	=	Total Loans to Total Deposit Ratio
USA	=	United States of America
VIFs	=	Variance Inflation Factors

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Microfinance has emerged as a crucial component of the global financial system, particularly in developing economies, where it was recognized as an effective tool for poverty alleviation and financial inclusion. The concept gained prominence following Professor Muhammad Yunus's 1976 pilot project in Jobra, Bangladesh, which provided small, collateral-free loans to rural women excluded from formal finance. After the institutionalization of Grameen Bank in 1983, this model showed that the poor could be "bankable". Poor having access to credit was a new idea. And, the success of Grameen model was revolutionary which became the foundation of modern microfinance (Li, 2021).

The success of the Grameen model helped in the growth of Microfinance Institutions (MFIs) across developing countries. Governments, donor agencies, NGOs, INGOs, and other development stakeholders supported this growth. These institutions also expanded the reach of microfinance by emphasizing on the financial access, social empowerment, gender equity, and community development. Hence, microfinance became an integral tool for promoting multiple Sustainable Development Goals (SDGs) which included poverty reduction, gender equality, and inclusive economic growth (Hulme, 2008; Arora & Singh, 2022).

In the Nepalese context, before MFIs were formally institutionalized in early 1990s, rural finance operated mostly in informal ways. The first noticed case of rural credit initiative was practiced in 1956 through credit cooperatives in Chitwan. Two regional Grameen Bikas Banks were established in 1992, inspired by Grameen model.

They expanded to all five development regions within a few years. After that, privately promoted MFIs such as Nirdhan Utthan Bank (1998) and Swabalamban Bikas Bank (2001) started operation. Similarly, alternative models like Deprosc (2000) and Chhimek (2001) also operated (Sharma, 2003).

The number of MFIs in Nepal exceeded 85 by July 2019 that included four wholesale microfinance banks, which engaged in refinancing and capacity-building (NRB, 2019). This number declined to 52 by mid-January 2025 due to the consolidation drive led by the Nepal Rastra Bank (NRB) through mergers and acquisitions (M&As). Around 75 percentage of these remaining MFIs are now operating as national level MFIs.

Globally, the rapid growth of MFIs brought optimism regarding its developmental potential. But the serious challenges such as multiple borrowing, over-indebtedness, and unethical lending practices started emerging overtime. Such issues had triggered crises in countries such as Bolivian (1999) and Andhra Pradesh, India (2010) in the past. Bolivian crisis showed that the intense competition among MFIs led to indiscriminate lending that resulted in widespread multiple borrowing and debt spirals. Clients repaid existing loans by acquiring new ones (Armendáriz & Morduch, 2010). Similarly, Andhra Pradesh crisis of 2010 originated due to the inconsistent government policies and profit driven behavior of MFIs that ignored responsible lending practices and left borrowers over-indebted (Mader, 2013).

Similar warning signs have also surfaced in Nepal. The Joint Struggle Committee of Entrepreneurs, in 2023, protested against financial institutions (FIs), including MFIs. They alleged MFIs and BFIs of exorbitant interest rate, high service charges, and unethical behavior by staff (Dhakal, 2023; Shrestha, 2023). NRB considered the challenges posed by the oversupply of microfinance services, and identified multiple borrowing as a systematic threat to the financial and social performance, sectoral stability,

and long-term sustainability. As the MFIs clients are socially and economically vulnerable such crises¹ have devastating consequences for already marginalized communities (Service, 2018; Express 2023).

NRB also accelerated the effective implementation of consolidation oriented policies such as the “Merger Bylaws 2068”, and “Acquisition Bylaws 2070”. They were operationalized through monetary policies, directives, and regulatory circulars. These measures aimed to safeguard the microfinance sector in particular and the financial system in general. The commercial banks, development banks, and finance companies were permitted to merger with or acquire one another, but MFIs were restricted to merging or acquiring only other MFIs (NRB, 2011).

After this policy move of NRB, the number of MFIs started declining from 91 to 64 by the third quarter of 2022 (Age, 2022), and ultimately to 52 by mid-January 2025. The NRB believed that consolidation through M&As could enhance operational efficiency, strengthen financial stability, and improve institutional sustainability of the financial sector, including that of MFIs.

As NRB promoted M&As as a key regulatory instrument to address structural limitations within the financial sector of Nepal, including MFIs, the effectiveness of this consolidation (M&As) strategy remains open to question. More precisely, it is not yet clear whether the existing M&As of the microfinance sector (MFIs) has experienced any improved institutional outcomes. This situation clearly highlights the importance of an empirical inquiry regarding the consequences of M&As within Nepal’s microfinance

¹ The crisis in Nepal’s microfinance and cooperative sectors has been prominently documented by the national online news portal Online Khabar through dedicated thematic series titled “[Microfinance Crisis Special](#)” (लघुवित्त संकट विशेष) and “[Cooperative Crisis Special](#)” (सहकारी संकट विशेष). These records provide relevant insights into institutional challenges, governance issues, and emerging financial challenges within the microfinance and cooperative sectors of Nepal. This situation justifies the necessity and importance of the problem addressed in our study.

industry. One of the areas of exploration could be the evaluation of financial performance and long-term viability of MFIs, if any.

1.1.1 Mergers in the Microfinance Sector of Nepal

The statutory framework governing M&As of Nepalese FIs, including MFIs, is guided by various legal and regulatory instruments. Some of them are the Nepal Rastra Bank Act 2058 (2002 A.D.), the Company Act 2063 (2006 A.D.), the Merger Bylaws 2068 (2011 A.D.), the Acquisition Bylaws 2070 (2013 A.D.), the Merger and Acquisition Bylaws 2073 (2016 A.D.), and the Bank and Financial Institutions Act (BAFIA) 2073 (2017 A.D.). These provisions jointly and collectively shape the M&As or consolidation framework of Nepal's financial sector. The NRB operationalizes these frameworks through monetary policies, joint directives, and issuing regulatory circulars.

The consolidation of five regional Grameen Bikas Banks² in 2014 (2071 B.S.) into a single national-level Grameen Bikas Bank—later renamed Grameen Bikas Laghubitta Sanstha Limited (GBLBS)—is considered as the first instance of merger³ among government-owned MFIs in Nepal. Similarly, the merger between Womi Laghubitta and Nagarik Laghubitta in 2019 represents the first case of consolidation among privately owned MFIs. Prior to these mergers, MFIs in Nepal largely operated independently at the district, regional, or national levels, with limited institutional consolidation across the sector.

NRB's monetary policies consistently link a strong capital base of FIs with broader macroeconomic objectives and explicitly promote M&As as a key instrument for strengthening capital base. For instance, clause 110 of the monetary policy (2068/69 B.S.;

² Clause 107 of the monetary policy 2069/70 B.S. (2012/13 A.D.) specifies the provisional plan to complete the merge of the five regional Grameen Bikas Banks.

³ The information presented here is triangulated by the author from multiple sources, primarily the official website of [Grameen Bikas Laghubitta Bittiya Sanstha Ltd. \(GBLBS\)](#), as well as publicly available data on [mergers and acquisitions of Nepalese financial institutions](#) maintained by Sharesansar. Due to the absence of formal documentation, these sources were used to corroborate the historical account of the merger of MFIs.

2011/12 A.D.) states that “*Financial stability will be strengthened through the promotion of corporate governance, healthy competition, and financial consolidation by encouraging FIs to undertake M&As*”. This principle is equally applicable to the microfinance sector. Similar policy linkages emphasize efficiency in financial service delivery (2013/14 A.D.), and long-term sustainability as direct outcomes of consolidation-driven capital strengthening.

Recognizing the importance of capital adequacy, NRB also introduced minimum paid-up capital requirements for MFIs in 2007 A.D. through a regulatory circular. This provision required MFIs to maintain paid-up capital of NRs 10 million for operations in 1-3 districts, NRs 20 million for 4-10 districts, NRs 60 million for regional level operations, and NRs 100 million for national level operation. MFIs could meet these requirements progressively through the annual capital plans by 2013 A.D. Despite NRB repeatedly emphasizing on M&As of MFIs in their monetary policies, the significant M&As of MFIs were noticed only after 2017/18. It could be because of the fact that MFIs wanted to meet the minimum paid-up capital requirement by the extended deadline of 2018 A.D. These M&As closely coincided with the period of NRB’s effective implementation of the Merger Bylaws 2068 (2011 A.D.) which documents and facilitates a formal regulatory mechanism for M&As of FIs across Nepal (ShareSansar, 2019).

NRB adopted both directive based and intensive based approach to promote M&As within the MFIs. The Directive approach required MFIs to meet capital thresholds within a given timeline. The incentive-based approach provided regulatory and operational relaxations to MFIs undergoing M&As. Clause 125 of the Monetary Policy (2076/77 B.S.; 2019/20 A.D.) lists many incentives such as extended timelines to reduce credit exposure exceeding the single obligor limit, additional time to comply with capital adequacy requirements, and exemptions from the mandatory six-month cooling-off period

for board members and CEOs when joining other licensed institutions. Also, MFIs undergoing M&As are permitted higher loan ceilings for individuals or groups in rural municipalities, with the maximum loan size for operating micro-enterprises increased from NRs. 1 million to NRs. 1.5 million against acceptable collateral. The policy also allowed resource mobilization through deposits derived from staff salaries, allowances, and other facilities.

Table 1 a

Distribution of MFIs in 2022Q3

Outreach District	Authorized Districts										Total
	3	4	8	9	10	12	13	14	19	77	
1-26	1 (2%)	1 (2%)	2 (3%)	1 (2%)	3 (5%)	4 (7%)	3 (5%)	2 (3%)	1 (2%)	7 (12%)	25 (42%)
27-52										19 (32%)	19 (32%)
53-77										16 (27%)	16 (27%)
Total	1 (2%)	1 (2%)	2 (3%)	1 (2%)	3 (5%)	4 (7%)	3 (5%)	2 (3%)	1 (2%)	42 (70%)	60 (100%)

Note. Figures in brackets indicate percentages of total MFIs; others represent frequencies.

Table 1a and Table 1b present the distribution of retail⁴ MFIs across authorized and outreach districts for 2022Q3 and 2024Q4, respectively. The data indicate a shift toward higher district-level operations (53-77 districts), with the number of MFIs in this category increasing from 16 (27%) in 2022Q3 to 17(35%) in 2024Q4, despite a decline in the overall number of MFIs. This decline in number of MFIs, and mostly growing as national level MFIs, aligns with NRB's capital-based reform initiatives. The results suggest that M&As helped in creating fewer, larger, and better capitalized MFIs.

⁴ Four wholesale MFIs were excluded, and only retail MFIs were considered to drawing tentative insights.

Similarly, it also indicates that the consolidation within the MFIs might have influenced institutional behavior, competition, and operational strategies.

Table 1 b

Distribution of MFIs in 2024Q4

Outreach District	Authorized Districts									Total
	3	8	10	12	13	14	18	19	77	
1-26	1 (2%)	2 (4%)	1 (2%)	4 (8%)	1 (2%)	2 (4%)	1 (2%)	1 (2%)	6 (12%)	19 (39%)
27-52									13 (27%)	13 (27%)
53-77									17 (35%)	17 (35%)
Total	1 (2%)	2 (4%)	1 (2%)	4 (8%)	1 (2%)	2 (4%)	1 (2%)	1 (2%)	36 (73%)	49 (100%)

Note: Figures in brackets indicate percentages of total MFIs; others represent frequencies

During this study sample period, from 2017Q3 to 2024Q4, more than 60 MFIs⁵ have either merged or been acquired. But the frequency of MFIs, between the sample period, had once exceeded 100 MFIs—including those waiting for NRB's operational licensing. This number declined to 52 by 2024Q4. Given this situation, and as mentioned earlier, M&As have strengthened the capital base of MFIs, because national level MFIs has increased. But M&As also raise crucial questions regarding its implications on financial performance—the main area of concern of this study. In other words, the concerns related to financial performance dimensions such as profitability, efficiency & productivity, sustainability, growth, and others. We contend that identifying and knowing

⁵ Compiled by author from various sources, including MFIs' quarterly sources and uses reports, progress reports, and websites such as [investopaper](#), [sharesansar](#), and others

these implications is essential for measuring the overall effectiveness of NRBs M&As strategy and its impact on the microfinance sector of Nepal.

1.2 Statement of the Problem

Now, this study will highlight the main issues of the current study, first by providing a glimpse of the overall development of financial system of Nepal, and then narrowing it down to the present context. Financial sector of Nepal changed significantly over the past decades. It grew from a government dominated system into a diversified, and competitive system. Nepal Bank Limited (NBL), the first bank as well as the first commercial bank, was established in 1937. After nearly two decades, Nepal Rastra Bank (NRB) was created in 1956—as the country’s central bank. Establishment and operations of these FIs served as the foundation of modern banking in Nepal. Other FIs or supporting institutions like the Nepal Development Corporation (1959), Employees Provident Fund (1962), Rastriya Baniya Bank (1966), and Agriculture Development Bank (1968) also added to the base of the Nepalese financial system. Economic liberalization policies in the mid-1980s, and their implementations 1990 onwards, helped the FIs in Nepal to grow and expand (Acharya, 2003).

Financial liberalization policy was the main responsible factor for changing the characteristics of Nepalese financial system. This policy encouraged private sectors to participate and help grow the access to financial services in Nepal. This ultimately increased the number of licensed and operating FIs. As for e.g., the number of FIs increased from six in 1980 to 136 by 2000. This represents a period of growth and diversification of the FIs in Nepal (Acharya, 2003). Similarly, MFIs also grew as an important component of Nepal’s financial system. NRB used MFIs to extend financial services to low-income households, rural communities, and marginalized populations.

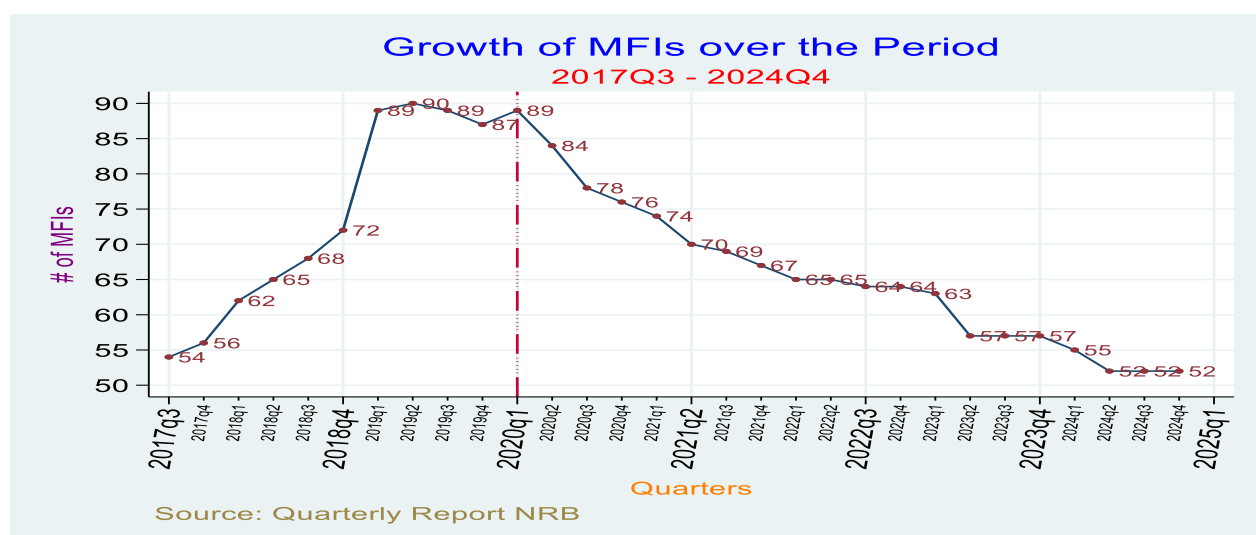
MFIs helped achieve financial and social inclusion objectives of both NRB and Nepal Government.

Post liberalization, FIs (BFIs, MFIs) noticed uncontrolled growth in numbers, along with serious problems, and challenges started to surface. Some of the noticeable problems, and challenges were weak services, low capital, inefficiencies, multiple borrowing, and increased over-indebtedness. These issues were also severe within the microfinance sector. To mitigate these effects, NRB gradually shifted its regulatory focus from expansion to consolidation. M&As were promoted as a policy instrument to strengthen institutions, improve capital, and enhance operational efficiency.

The impact of NRB's M&As policy is clearly visible in the declining number of MFIs as shown in Figure 1, depicting the number of MFIs from 2017Q3 to 2024Q4. The number of MFIs declined from nearly 90 MFIs to 52 by the end of 2024. The decline is attributed to the implementation of stricter capital requirements, merger bylaws, and incentive based regulatory policies of NRB. The figure imply that M&As of MFIs in Nepalese context is not incidental. They are a direct result of policy actions in Nepalese microfinance sector.

Figure 1

Growth and consolidation of MFIs in Nepal (2017Q3 – 2024Q4)



In congruence with the above discussion, M&As are generally expected to strengthen FIs and MFIs. They can improve FIs and MFIs capital base, reduce operational redundancies, and generate economies of scale. But, their actual impact on financial performance of FI and MFIs is unclear and limited. Studies by Njambi & Kariuki (2018), Gathuku & Njeru (2016), Adhikari, Kavanagh, & Hampson (2023), and Ansari et al., 2021 show this. They discuss the theories of M&As leading to improvements in profitability, operational efficiency, financial sustainability, and institutional growth, but in the context of their empirical results they suggest that M&As outcomes are often mixed. They also report that some institutions experience gains in profitability and efficiency after M&As, while others face integration costs, cultural mismatches, client attrition, and short-term operational problems.

In Nepal, the number of MFIs has declined due to M&As, as shown in Figure 1. But, the impact of M&As on different dimensions covering financial, social, and economic aspects, are still unclear. Financial performance is important for MFIs because it measures institutional success. It also determines an MFI's ability to serve poor and marginalized groups. Financial performance measures cover several dimensions. Some of them are profitability (e.g., return on assets (ROA), and return on equity (ROE)); efficiency & productivity (e.g., loan officer productivity; loan portfolio per staff (LPPS)); financial sustainability (e.g., debt to equity ratio (D/E)), and institutional growth, reflected in loan portfolio expansion (grLoan) and borrower outreach (grBorrower). These dimensions help MFIs to remain viable and meet social mission.

NRB's M&As strategy assumes that stronger, and larger MFIs will be more resilient. In return, stronger and larger MFIs become efficient, and capable of supporting economic goals of NRB. Relating to these expectations of NRB, the issue raised becomes more relevant—whether M&As of MFIs have improved their financial performance or

not. Or has it created new risks and performance trade-offs? This study, thus, utilizes it as an opportunity to fulfill the need for a systematic empirical study to answer whether M&As have strengthened MFIs, in practice, or whether the expected gains are mere theoretical.

This study has identified a clear research gap regarding the lack of evidence on post-merger financial performance of MFIs in Nepal. To disaggregate it further, the need for a detailed study to measure how M&As affect profitability, efficiency & productivity, sustainability, and growth is identified. Filling this gap is important, and the evaluation of NRB's M&As policy is crucial to inform the future regulations. This study aims to fill this gap by analyzing the impact of M&As on the financial performance of Nepalese MFIs. The findings are expected to contribute to policy discussions and to the literature on financial sector M&As in developing countries.

So, this study has addressed the following research question:

1. What is the impact of mergers and acquisitions (M&As) on the financial performance of MFIs in Nepal?

This question is examined by evaluating the effects of M&As on profitability, efficiency & productivity, sustainability, and growth, as the measures of financial performance. These dimensions are measured using key performance indicators. The indicators used under each dimension are discussed in detail in Chapters II and III.

1.3 Objectives of the Study

The main objective of this study is to examine the impact of M&As on the financial performance of MFIs in Nepal. In other words, the study aims to:

- Evaluates the effect of M&As on profitability of MFIs (ROA, ROE)
- Assess the impact of M&As on efficiency & productivity (LPPS)
- Examine the impact of M&As on financial sustainability (D/E)

- Investigate the effect of M&As on growth, measured through loan portfolio expansion and borrower outreach.

1.4 Significance of the Study

The results of this study, i.e. impact of the M&As on the financial performance of Nepalese FIs, are useful to the individual MFIs (FIs, BFIs), their supervision (NRB Supervision Department) and regulatory bodies (NRB, and different ministries of Nepal), subject experts (MFIs expert, development expert, MFIs specialists), academicians & researchers (finance, management, economics, social sciences, and others), and several stakeholders (local governments, NGOs, INGOs, freelancer, and others).

In Nepal, apart from MFIs, many commercial banks also provide microfinance services. Other FIs, such as cooperatives, and informal groups, also provide services resembling to that of microfinance. So, the findings of this study will help these FIs devise proper M&As strategies if they opt for it in the future. Similarly, the research will help them with different aspects of M&As or research procedures which they can utilize in their respective fields.

The regulatory body NRB and microfinance supervision division, under NRB, will benefit from this study. Besides knowing the effectiveness of M&As of MFIs, they will also have a glimpse on the performance status across the disaggregated dimensions of financial performance—profitability, efficiency & productivity, sustainability, and growth related to loan portfolio. NBR and MFIs supervision division can devise policies, and suitable programs to further strengthen MFIs. They can also pursue researches covering others dimensions of performance, and effectiveness due to M&As.

As this study discusses subjects such as M&As, financial performance, MFIs (BFIs, FIs), Difference-in-Differences (DiD), they are also useful for the studies covering similar subjects, as knowledge reference, or useful for other topics—such as impact

evaluation, causal impact, policy evaluation—to measure causality of the policy intervention (in this study, the policy intervention is the M&As push for MFIs by NRB through minimum paid-up capital requirements). All the stakeholders, academicians, experts, and researchers related to any of the stated subjects or areas can benefit from the result of our study.

1.5 Organization of the Report

This study is organized into five chapters. In the first chapter, it presents the background of the study (related with MFIs, M&As, Financial performance), statement of the problem (highlights why measuring impact of M&A on financial performance of MFIs in Nepal is relevant), research gap (Nepalese MFIs context, DiD), objectives (M&As, FP dimensions), and significance (useful to MFIs, NRB, and stakeholders) of the study. Chapter two reviews the existing relevant literature from theoretical (efficiency and synergy) and empirical (past studies on M&As, MFIs, Financial performance—and its dimensions) perspectives.

Chapter three explains the methodology (MFIs, Parallel trend assumption, DiD). It covers the research design (quantitative, quasi-experimental, natural setting), mathematical model (DiD), sample and population, hypotheses (H_0 : no impact of M&As on Financial performance), and data sources (Quarterly data from 2017Q3 - 2024Q4, NRB reports).

Chapter four presents descriptive statistics (Mean, SD, CV, Min, Max, correlation), Difference-in-Differences (DiD) results, and findings related to each hypothesis of the study. Finally, chapter five concludes the study. It includes a summary, discussion, implication, conclusion, and critiques.

CHAPTER II

LITERATURE REVIEW

In this chapter—Literature Review, the literature on M&As and financial performance, prioritizing MFIs, is reviewed. Both, theoretical and empirical reviews are detailed. After reviewing theories of M&As and their impact on financial performance, it then reviews the empirical studies covering the same topics. The conceptual framework is then presented, which reports the key variables and their relationships.

2.1 Theoretical Literature

Rompotis (2015) explains that M&As can be classified using many dimensions or categories. The main distinction in it is based on the business sectors of the firms involved. He states that horizontal M&As occur between companies operating in the same sector. The main objective of such M&As is to increase market share. He alerts that such M&As may reduce competition and create negative social welfare effects. Similarly, he states that vertical M&As involve firms operating at different stages of the same production and supply chain. Such M&As can also be classified as forward and backward mergers which allows firms to internalize distribution or production activities. According to him, conglomerate M&As take place between firms operating in unrelated business sectors. Such M&As are driven by diversification motives. He states acquisition as the purchase of a smaller firm by a large one, although reverse takeovers and reverse mergers also exist. He classifies M&As based on the listing status of the target firms as public or private. Another classification based on the nature of consent involved are friendly or hostile acquisitions. Similarly, he states some specialized forms of M&As. They are management buyouts, joint ventures for shared objectives, leveraged buyouts financed through debt, and corporate restructuring strategies such as demergers, spin-offs, and spin-outs. He suggests

that these classifications provide a useful foundation for understanding the theoretical explanations of M&As activity.

After the classification of M&As, theories behind M&As motives are presented. Many scholars have proposed theories explaining why firms engage in M&As. Trautwein (1990) reviews seven major theoretical ideas motivating M&As activity. He states that efficiency theory provides a strong explanation for M&As activity. He finds that M&As are strategic decisions taken to improve financial and operational performance through synergistic gains. Alchian (1950) and Manne (1965) explain the efficiency theory of M&As from a neoclassical economic perspective. They suggest that M&As can generate economies of scale, economies of scope, reduce cost, improve resource allocation, and enhance managerial efficiency. Jensen (1986) extends this argument through the concept of the market for corporate control. He states that M&As can discipline inefficient management and reallocate resources toward more productive uses. Based on these arguments, efficiency theory expects improvement in multiple dimensions of firm performance, including profitability, efficiency & productivity, financial sustainability, and growth. It expects improvements to take place through financial, operational, and managerial synergies from M&As. So, this study adopts the efficiency theory to examine whether M&As lead to improvements across a key financial performance indicator of MFIs.

In addition to efficiency theory, Trautwein (1990) discusses several alternate theories for M&As motives. Scherer (1980), through monopoly theory, argues that M&As are used to increase market power and reduce competition. Steiner (1975), in valuation theory, explains that M&As occur because acquiring firms possess superior information and exploit market mispricing. Baumol (1959) and Marris (1964), in empire building theory, argue that M&As may be driven by managerial self-interest and desire for growth

maximization rather than shareholder value. Cyert & March (1963), in process theory, introduce behavioral and institutional explanations for M&As. They argue that M&As occur due to limitations in rational decision-making ability of managers. Holderness & Sheehan (1985), in raider theory, explain that M&As may result from opportunistic takeover behavior. Gort (1969), in disturbance theory explains that M&As are results of macroeconomic shocks.

Besides these theories of M&As, practical motivations for M&As activity are now presented. Rompotis (2015) finds that capital market conditions play a significant role for M&As activity, among different other factors. Nelson (1959) finds that stock market movements and valuation errors are related to M&As activity. Ravenscraft & Scherer (1989), Comment & Jarrel (1995), and Lewellen (1971) find that firms pursue M&As to achieve improvements in financial performance through short-, medium-, and long-term benefits. According to them, the benefits include improvements in EPS and P/E, operating and financial synergies, enhanced liquidity, risk reduction, access to cheaper capital, managerial expertise acquisition, and technology transfer. Servaes (1996) add that diversification is important motivation for M&As. Hasbrouck (1985) M&As or takeovers are mechanisms for managerial discipline. Scholes & Wolfson (1990) find that cross-selling opportunities, market entry, and tax advantages are the motives of M&As. According to them, medium term benefits arise from economies of scale and scope, improved bargaining power, and stronger financial positions. Similarly, long term motives include strengthened competitive advantage, sustained synergies, innovation through acquisition, and global competitiveness, and resistance to hostile takeovers.

Fatihudin et al (2018) defines financial performance as the degree to which a firm achieves its financial goals through effective resources management and creating economic values. Jensen & Meckling (1976), through Agency Theory, argue that firm

performance depends on how well managers' interests align with those of shareholders. Barney (1991), in Resource-Based View, argues that a firm's successful performance comes from its own unique internal strengths. Myers & Majluf (1984), in Pecking Order Theory, explain that companies prefer using internal financing before taking on debt. To operationalize these theories, Ross et al. (2022) state that financial ratios are used commonly and discusses broader dimension of performance measures that supports out study. This study uses ratios to measure profitability, liquidity, efficiency & productive, sustainability, and growth based on loan portfolio and borrower.

2.2 Conceptual and Empirical Literature

The empirical review is now presented under three sub-sections. The first sub-section discusses M&As in the microfinance sector, the second includes literature on the approaches to measuring financial performance, and the third includes literature on the relationship between financial performance and M&As.

2.2.1 Mergers acquisitions in the microfinance sector

As MFIs serve poor, rural, disadvantaged, and vulnerable communities—mostly women—the M&As motives should prioritize outreach expansion, and sustainability. Carter (2002) states that M&As of MFIs are motivated by both social and operational goals. He examined 12 M&As case studies of MFIs across countries such as Russia, Cambodia, El Salvador, the Philippines, USA, West Bank/Gaza, Bosnia and Herzegovina, Nicaragua, and Paraguay. He reported 10 successful M&As cases in different countries, and two failed cases in Bolivia. He attributed success of M&As on careful planning, strong institutional foundations, effective leadership, and well managed integration processes. He notes that integrating staff or employees into an efficient work culture after M&As is challenging. He concludes that, in the context of MFIs pursuing a double bottom line—wealth creation for shareholder and profitability, as well as social objectives—

differences in history, culture, mission, business strategy, and client network must be carefully considered before M&As of two or more MFIs.

Another study, by Shah (2019), uses SWOT analysis to explain different aspects of M&As in Indian MFIs. He explains that M&As can bring many strengths and open new opportunities. They can cut costs and help MFIs grow bigger. They can also provide cheaper funding, support growth, and spread products and risks. At the same time, Shah also talks about the weaknesses and threats of M&As. These include valuation issues and cultural or work style clashes. He also mentions regulatory limits, funding gaps, and the risk of expecting too much from synergies. Shah explains that MFIs are not all alike. Some focus on social goals and work as non-profit MFIs. Others MFIs focus more on profits. Due to this, he argues that M&As decisions should always respect their mission. He stresses for careful due diligence, realistic synergy plans, and support from stakeholders. He concludes that M&As can support growth in competitive MFIs markets when handled with balanced, care for people, and a broad view.

Similarly, Tiwari and Chasnow (2019) study the Sonata-Jeevika acquisition in India. They look at how Sonata finance acquired the full microfinance work of, a non-profit MFI, Jeevika Livelihood Support Organization in August 2007. The authors explain the steps of acquisition, how the value was set, the integration problems, and what happened after acquisition. They find that M&As help well managed MFIs in different regions grow fast. In this case, private equity funding from Bellwether Microfinance Fund played a key role. Strong institutional support also helped the transaction to grow. The supports are good leadership, skilled staff, strong loan books, and existing client base. The authors also explain the difference between buying loan portfolios and buying full institutions. They point out regulatory and stakeholder issues in both cases. The authors stress that strong coordination at senior and operational levels is vital for success. They

show that Sonata's outreach and loan portfolio grew sharply after the acquisition. They conclude that M&As can be powerful tools when there is clear strategic fit and careful integration.

Aiba (2024) looks at MFIs in Cambodia that were acquired by local and foreign private investors, mostly commercial banks. He studies how these takeovers affect the way MFIs operate and who they lend to. He uses district-level data and the Difference-in-Differences (DiD) method to study how acquisitions affect lending behavior. He finds that acquisitions led to larger loan portfolios. However, lending shifted away from rural areas to urban areas. The author suggests that change in ownership can lead to mission drift in MFIs. He also argues that commercial investors can strongly shape operational priorities and the type of clients MFIs serve. He concludes by stressing the role of impact-focused investors in keeping a balance between growth goals and social lending missions of MFIs.

When Chen (2017) studied the growth of Peru's microfinance sector, he saw how rising competition and crowded markets pushed MFIs toward M&As. As the sector grew, both commercial banks and private MFIs got involved for expansion. Chen noticed that high competition forced MFIs to work more efficiently, offer more services, and try new approaches. At the same time, falling interest rates cut profits, making growth harder. To keep moving forward, and to retain growth, MFIs turned to M&As. Leading MFIs acquired smaller regional MFIs, and big commercial banks acquiring and merging several private MFIs. This created a few dominant players in the market. Chen also mentions the role of technology. MFIs that adopted fintech not only survived but gained efficiency, innovation, and a wider reach. He concludes showing how M&As combined with technological adopted reshaped Peruvian microfinance into a competitive, digital sector, improving both efficiency and outreach.

To sum up, as discussed in this sub-section, these studies show common patterns and country-specific differences in M&As of MFIs. Carter (2002) and Shah (2019) stress on planning, strong institutions, leadership, mission fit, and profit goals for successful M&As. Tiwari and Chasnow (2019) emphasize that private equity backed acquisitions support expansion. Aiba (2024) warns that dominated commercial interest shifts the social mission of MFIs after acquisition. Chen (2017) shows that competition and saturation forces for M&As, but also improve efficiency and outreach—through technology adoption. It can be concluded that, despite the benefits of scale and improved efficiency, all studies stress risk in valuation, cultural integration, and maintaining social objectives. They emphasize the need for careful due diligence, realistic synergy goals, and people focused integration for successful M&As outcomes⁶.

2.2.2 Review on financial performance evaluation

Cochran and Wood (1984), in their study *Corporate Social Responsibility and Financial Performance*, noted that though corporate social responsibility (CSR) are measured in diverse ways, there is no clear consensus on the proper measure of financial performance. This led to many different ways to measure financial performance. The authors looked again at the relationship between CSR and financial performance. This time, they used a new methodology, better techniques, and control groups to each industry. They found that the average age of corporate assets was highly correlated with CSR rankings, suggesting that older firms may inherently appear more socially responsible. Even after they controlling for the average age of corporate assets, a positive correlation between CSR and financial performance persisted, which suggests that firm characteristics such as age may influence observed outcomes. This result allows us, in the

⁶ This study has already covered the scenario of M&As in Nepalese MFIs in the background subsection titled “Mergers in the Microfinance Sector of Nepal”, and well as in the problem statement of Chapter I.

context of MFIs, to use the age of an MFI as a control variable which can help account for characteristics such as organizational maturity, scale of operations, and institutional experience, allowing for a more accurate assessment of performance. This demonstrates the broader utility of age⁷ as a control variable, even in contexts different from the original CSR-focused study.

Chen and Shimerda (1981) emphasize that financial ratios are commonly used to evaluate firm performance and financial condition. The past empirical studies show that ratios can effectively identify financially troubled firms and closely replicate institutional bond ratings. Referring to different studies, the authors emphasize the challenge of selecting the right ratios, as different studies use different ratios and their results are also mixed. Looking at past research, they report that 26 studies examined over 100 financial items. They found 41 ratios as useful in at least one analysis. With so many options, it is hard to include all ratios in a one model. Decision-makers may not know which ratios to pick or whether to follow one study or several. To solve this issue, the present study takes a flexible approach in selecting ratios that measures financial performance. We select ratios that fit Nepalese MFIs and are practical and useful in this context.

Two widely recognized performance measurement frameworks, namely CAMELS and PEARLS, also rely on ratios as indicators across thematic dimensions and are frequently applied in the microfinance and cooperative sectors. Ankita & Samajpati (2025) describe the CAMELS framework, a globally accepted supervisory model developed by U.S. banking regulators and extensively used to evaluate financial stability and risk profile of financial institutions. The authors list the dimensions of the CAMELS framework, highlighting the focus of each dimension and their main indicators as follows:

⁷ This study has taken the age of MFIs as a control variable to account for features or characteristics associated with the maturity of the institutions.

- **Capital Adequacy (C)** = Focuses on a firm's solvency and ability to absorb risks; key ratios are CRAR, Tier 1 capital ratio, and leverage ratio;
- **Asset Quality (A)** = Focuses on credit risk and loan performance; key ratios are Gross NPA, Net NPA, and Provision Coverage Ratio;
- **Management Quality (M)** = Examines governance and operational efficiency; key ratios are Cost-to-Income Ratio, Staff Efficiency Ratio, and Internal Audit Score;
- **Earnings (E)** = Captures profitability and sustainability; key ratios are ROA, ROE, Net Interest Margin, and Operating Profit Margin;
- **Liquidity (L)** = Focuses on short term funding strength; key ratios are Liquidity Coverage Ratio, Liquidity Assets to Total Assets, and Statutory Liquidity Ratio
- **Sensitivity to Market Risk (S)** = Evaluate exposure to external shocks; key ratios are Interest Rate Sensitivity, Duration Gap, and Foreign Currency Exposure Ratio

The authors note that these are representative ratios for each dimension, and are not a complete list.

Richardson (2019), supporting the PEARLS framework, argues that while CAMELS framework is mainly a supervisory tool, that focuses on solvency and safety, PEARLS framework is a management tool that also considers financial structure and growth into its evaluation. Richardson calls PEARLS a complete framework for checking financial performance. It can be used for evaluating credit unions and MFIs.

The lists of six key dimensions of PEARLS, and their focus area, as mentioned by Richardson (2019), are as follows:

- **Protection (P)**= Checks if allowances for loan and investment losses match bad loans and risky investments.
- **Effective financial structure (E)**= Looks at how assets, liabilities, and capital are arranged to fund non-earning assets, improve earnings, and cover losses.
- **Asset quality (A)**= Checks delinquency levels, the share of non-earning assets, and how these assets are financed.
- **Rates of return and costs (R)**= Looks at profits from loans, investments, and other assets. Also checks costs, administrative expenses, and provisions for losses.
- **Liquidity (L)**= Measures the ability to meet withdrawal using total liquidity reserves and the idle liquid funds.
- **Sign of growth⁸ (S)**= Links sustainability to profits by tracking growth in assets, loans, savings, shares, and institutional capital.

Kharti (2014) looks at how well MFIs perform financially. He defines the financial performance of as their ability to cover operational and financial costs. He uses ROA and ROE as key indicators of financial performance. ROA shows how efficiently an MFI uses its resources to make profits, while ROE shows how much profit is earned compared to shareholder equity. He uses data from 10 MFIs in Morocco from 2003 to 2010. He looks at factors like interest expenses, equity, loan portfolio quality, and staff productivity. These variables reflect how mature an MFI is, how well it runs, and if it can sustain itself. Kharti finds that older MFIs, better loan portfolios, and higher equity-to-asset ratio are perform better. Staff productivity and program outreach also help MFIs stay financially

⁸ This study focuses on growth, following the PEARLS framework and past studies.

healthy. Most variables in the preset study⁹ match with those used by Kharti (2014), both in what they measure and the overall focus.

To sum up, the literatures discussed in this sub-section show that financial performance are measured using multiple dimensions. These studies emphasize on firm specific characteristics and financial ratios selection, as they play a critical role. Age or organizational maturity is important control variable for MFIs. CAMELS and PEARLS frameworks provide structured approaches to measure solvency, profitability, asset quality, and growth. These studies also show that no single measure can fully capture performance, and suggest to select ratio considering context specific and flexible approach. Building on these studies, this research considers profitability, efficiency & productivity, sustainability, and growth as thematic dimensions to measure financial performance.

2.2.3 Financial performance and mergers and acquisition

In this subsection, the study reviews empirical evidences on the relationship between financial performance and M&As, with a focus on MFIs. Studies measuring the impact of M&As on the financial performance of the Nepalese MFIs are lacking- at least those covering all four dimensions of our study. So, evidence from national and international banking and financial sector, or MFIs from other countries provides guidance to us. Njambi & Kariuki (2018) uses secondary data and apply a paired t-test to compare pre- and post-merger performance of Kenyan FIs. They find a statistically significant improvement in financial performance following M&As. The regression results also indicate that a strong capital base, income diversification, asset quality, and liquidity have positive and significant effect on post-merger performance. Their findings

⁹ The variables and thematic areas in this study such as ROA, ROE, Age of MFIs, Interest Rate, Profitability, Sustainability, Efficiency & Productivity, align with those in Kharti's study. Specifically, Debt/TA corresponds to Debt/Equity, and Number of Loans per Employee aligns with Loan Portfolio per Employee.

align with the value increasing and market power theories, which posit that M&As generate financial synergies. They also warn that inadequate planning may result in reduced benefits post M&As, as per the hubris hypothesis.

In his study, Zuhri et al. (2020) examines the impact of M&As on the financial performance of 51 companies listed on the Indonesia Stock Exchange. They use a pre post analysis considering 2015 as the intervention year. They use ROE and ROA to measure profitability and the D/E ratio to measure solvency. The data is analyzed using a nonparametric Wilcoxon signed-rank test. The results show no significant difference in ROE before and after M&As. The average and median ROE also decline after M&As. Similarly, Profitability does not show significant short-run effect. But, the D/E ratio increases after M&As, indicating that solvency has declined after M&As. They conclude that M&As do not consistently improve financial performance in either the short or long term. The authors remind that limited sample size and short observation periods limited the generalizability of their results.

In another study, Ansari et al. (2021) analyze the impact of M&As on the financial performance of MFIs in Pakistan. They use quantitative approach of analyzing data using paired t-tests. They compare financial performance over three years, with two pre-merger and one post-merger year. Thirteen financial ratios are used to cover liquidity, profitability, and solvency dimensions. They find that liquidity ratio- including the current ratio, investment to total assets, deposit to total assets, and advances to total assets, changed after M&As but are insignificant. Profitability measures ROA, ROE, net profit margin, EPS, and return on capital employed, display mixed but insignificant results. Similarly, solvency measures such as debt ratio, interest coverage ratio, D/E ratio, and capital ratio show insignificant post-merger changes. The authors conclude by accepting

the null hypotheses that M&As do not have a significant impact on the financial performance of MFIs in Pakistan.

In the Nepalese context, Adhikari, Kavanagh, Hampson (2023) examine the impact of M&As on the financial performance of two commercial banks using six years data around the M&As. The sample banks are Bank of Kathmandu Limited (BOKL), and PRVU Bank Limited. They use 12 indicators to look at profitability, liquidity, leverage, and shareholder wealth. Profitability is measured with ROE, ROA, and NIM. Liquidity is measured with CETA and ITA. Leverage uses DE, CAR, and TLOTD. Shareholder wealth is measured with EPS, MPS, and DPS. The results, analyzed using paired t-test, are mixed. For BOKL, ROA, NIM, and ITA are significant, but D/E is insignificant. Shareholder wealth, for BOKL, falls as both DPS and MPS drop. Similarly, for PRVU bank, M&As only affect DPS significantly. The authors conclude that M&As in Nepalese commercial banks provide limited benefits, especially when weaker BFIs are involved in M&As. They recommend that M&As among strong commercial banks to enhance synergy, efficiency, financial stability, and corporate governance.

In their study, Godwin et al. (2024) investigate the effect of M&As on the financial performance of commercial banks in Nigeria. The secondary data includes two M&As phases between 2008 and 2022. Financial performance is measured using indicators of capital adequacy, asset quality, managerial efficiency, earnings quality, and liquidity. They use t-test for data analysis. They find significant positive effects of M&As on capital adequacy, managerial efficiency, earnings quality, and liquidity, and insignificant effect on asset quality. They conclude that M&As improve the financial performance of Nigerian commercial banks, except asset quality.

In conclusion, the reviewed literatures show mixed impact of M&As on financial performance. Most of them value institutional and country-specific aspects as important.

Profitability, liquidity, solvency or leverage, capital adequacy, asset quality, managerial efficiency, productivity, growth, and shareholder wealth (Njambi & Kariuki, 2018; Ansari et al., 2021; Adhikari et al., 2023; Godwin et al., 2024) are commonly used financial performance dimensions. Some studies find M&As improve financial performance, while others find insignificant or inconsistent effects, mostly in the short run (Zuhri et al., 2020; Ansari et al., 2021). Most of the results are from commercial banks, while only few MFIs. In the Nepalese context also, the results are mostly from commercial banks, and the impact of M&As on Nepalese MFIs are unexplored, thus a contextual research gap is created. From methodological point of view, most of the studies rely on pre-post comparisons using paired sample t-tests or similar techniques. These are the limitations because such methods do not adequately control for time related and external factors. Therefore, the present study incorporates the financial performance themes mostly discussed in these studies. It also fills the contextual gap by considering the Nepalese MFIs, and also fills a methodological gap by employing a Difference-in-Differences (DiD) approach- to generate more robust empirical evidence.

2.3 Conceptual Framework

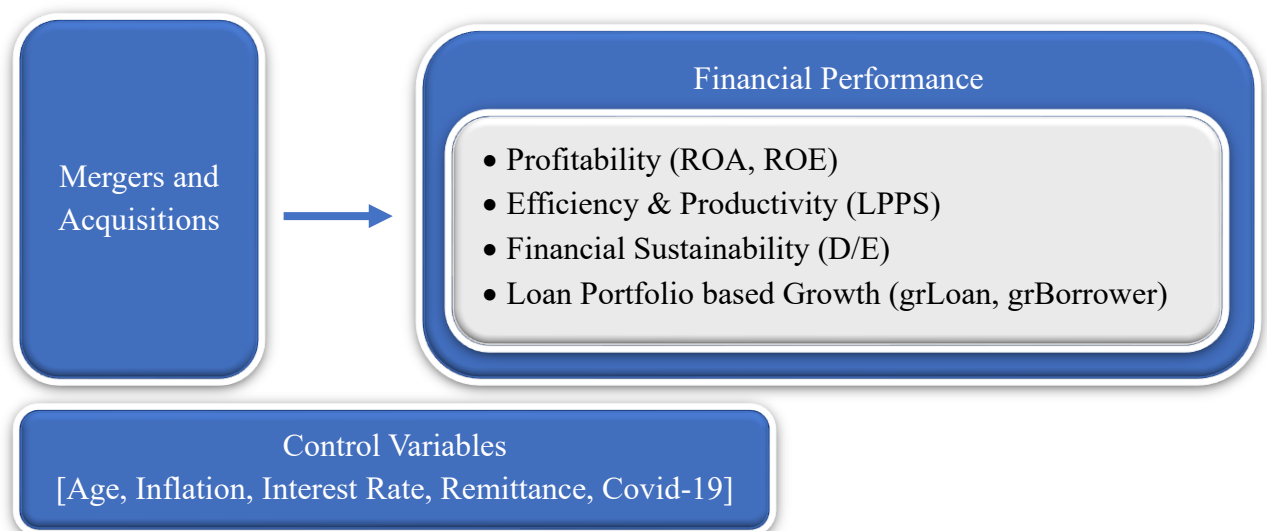
The conceptual framework that guides this study is presented below in Figure 2. It illustrates the relationship between M&As and financial performance after netting out the effects of relevant control variables.

This study is based on efficiency and synergy theory. These theories suggest that firms go for M&As to gain efficiencies and create value which they can't achieve when they are single. According to these theories, M&As create synergies through cost savings, economies of scale, improved operational efficiency, and enhanced resource utilization. The combined synergies then result in impacted outcomes. Following this conceptual framework, M&As of MFIs are treated as the main independent variable, which is the

result of MFIs complying with the minimum capital requirement deadline set by NRB. Financial performance is the dependent variable, or the outcomes of interest, considering M&As of MFIs. Financial performance dimensions are profitability, efficiency & productivity, sustainability, and growth. The key indicators for each dimension are valid ratios. The framework incorporates control variables as well. It uses control variables to capture MFI specific and macroeconomic-specific factors that influence financial performance. Controlling for these variables allows the study to more accurately isolate the impact of M&As on the financial performance of Nepalese MFIs.

Figure 2

Conceptual framework



CHAPTER III

METHODOLOGY

In this chapter, the study discusses and presents the methodology used to measure the impact of M&As on the financial performance of Nepalese MFIs. It explains topics like research design, population and sample, data sources, and research hypotheses. The process to validate the parallel trend assumption, and a DiD model used to estimate essential parameters are also described. Similarly, definitions and operationalization of variables used in the study are also explained. Finally, the validity, reliability, and robustness checks incorporated by the study are explained.

3.1 Research Design

The use of numerical figures and data, along with the quantitative nature of analysis and estimation methods, makes this study quantitative. Similarly, by dividing the data into two groups, as control and treatment group, based on the M&As of MFIs, the study follows a quasi-experimental research design. Also, M&As among MFIs are the result of minimum paid-up capital limit set by NRB, but MFIs are free to choose the MFIs to merge with, making this study a natural experiment. The sample period covers quarters from 2017Q3 to 2024Q4, which includes both pre- and post-merger quarters. The MFIs going for M&As are taken as treatment group while control group consists of MFIs that did not go for M&As. The pre and post M&As period is determined using 2020Q1 as period of distinction. Given these two M&As groups, and M&As periods a Difference-in-Differences (DiD) framework is used as a suitable model to compare changes in financial performance. In the DiD model, this study uses a M&As indicator, a pre-post M&As period indicator, and their interaction term, as well as important MFIs specific and macroeconomic control variables to measure the real effect of M&As on financial

performance of MFIs. As there are uneven entry and M&As of MFIs, the dataset is an unbalanced panel. Thus, the study employs a quasi-experimental research design, in a natural experimental setting, and use DiD model to provide robust estimates of the impact of M&As on MFIs financial performance of Nepalese MFIs.

3.2 Population and Sample

The population of this study comprises all licensed microfinance institutions (MFIs) operating in Nepal during the period from 2017Q3 to 2024Q4. The sample, of 60 MFIs after dropping four wholesale MFIs from a total of 64 MFIs, is based on the availability of consistent financial and institutional data, with emphasis on merger and acquisition (M&As). The total number of MFIs was 64 in 2022Q3. This quarter is considered as a reference period to construct data. All MFIs observed before this period are linked to these 64 MFIs based on their merger or non-merger outcomes. MFIs observed after 2022Q3 are included in their natural form. This approach results in a sample that closely mirrors the population, and makes it equivalent to census. The MFIs that underwent mergers or acquisitions, during the study period, are classified as the treatment group. Similarly, MFIs that did not go for M&As are treated as control group. This allows for a comparison of financial performance patterns between the treatment and control groups. Any issues arising from the mapping of observations or the differing timing of M&As are limitations of the study.

3.3 Sources of Data

This study uses secondary data from many reliable sources. The main data comes from the NRB database and quarterly reports of its Microfinance Supervision Division. They provide financial statements, institutional profiles, and verified M&As records for MFIs. M&As events are cross-checked referring to annual reports and official merger notifications from various sources. Macroeconomic and MFIs-specific data are compiled

from the Nepal Central Bureau of Statistics, the World Bank, ShareSansar, and other financial websites. This helps to control for different external and internal factors influencing the financial performance. At the end, the dataset was finalized covering the period from 2017Q3 to 2024Q4. This dataset has a clear distinction between pre and post-merger quarters. This approach provided a reliable, consistent, and comprehensive dataset for the study.

3.4 Research Hypothesis

Given the mixed and inconclusive findings on the relationship between M&As and the financial performance of MFIs, as per the empirical evidence reviewed in chapter II, this study tests non-directional hypotheses. The aim is to examine the causal effect of M&As under the natural experimental setting, of Nepal MFIs. The following hypotheses are tested:

H₁(1): M&As have an impact on the profitability of MFIs.

H₁(2): M&As have an impact on the efficiency & productivity of MFIs.

H₁(3): M&As have an impact on the sustainability of Nepalese MFIs.

H₁(4): M&As have an impact on the loan portfolio specific growth of MFIs.

These hypotheses are tested using the DiD method, comparing MFIs that underwent M&As (treatment group) with those that did not (control group), before and after the intervention period.

3.5 Parallel Trend Assumption

According to Angrist & Pischke (2009), the Difference-in-Differences (DiD) methodology depends on the parallel trend assumption. This assumption states that, in the absence of treatment (M&As), the average outcomes (financial performance) for the treatment (merged MFIs) and control groups (non-merged MFIs) would have followed a similar path (parallel trend) over time. This assumption is important because any

differences in pre-treatment (pre-M&As) trends can bias the estimated treatment effect. Such bias weakens validity of the DiD analysis. Showing that both groups (merged MFIs, non-merged MFIs) followed similar (parallel) trends before the intervention (M&As) proves that observed post-intervention (after M&As) differences are caused by the treatment (M&As) itself, rather than existing trends (influence of macroeconomic variables) or any other unobservable factors (socio cultural, managerial ability, geographical features etc.).

To test parallel trend assumption, this study uses both graphical and linear regression method. In graphical method, the financial performance variables (outcome of interest variable) were plotted over time for both treatment (merged MFIs) and control groups (non-merged MFIs). Both pre and post intervention (M&As) periods are covered. This visual check helps to notice if the two groups (merged MFIs, non-merged MFIs) moved similarly before the intervention (M&As). It gives an early look for showing possible issues. In linear regression test, since the visual checks are more descriptive, the study follows the procedures suggested by Riveros-Gavilanes (2023). This test helps to test if the pre-intervention (pre-M&As) trends are different between the two groups (merged MFIs, non-merged MFIs). The linear regression test provides statistically valid results to either confirm or reject the parallel trend assumption. By combining both the graphical and linear regression tests, the analysis becomes clearer and more reliable. This ensures that the DiD estimates are accurate and well-supported.

The study now explains the Riveros-Gavilanes (2023) process of testing parallel trend assumptions using a linear regression method. He defines the sample timeframe as $T(a,b)$. Here, a is the sample starting period, and b is the sample ending period. The intervention happens at $t=0$, which lies somewhere between a and b . These boundaries are set by T . Based on this timeline; two dummy variables are created. $D^{pre}(t)$ represents the

pre intervention period (pre-M&As). $D^{post}(t)$ represents the post intervention period (post M&As). More precisely, these variables are generated as follows:

$$D^{pre}(t) = \begin{cases} 1 & \text{if } t \leq -2 \\ 0 & \text{otherwise} \end{cases} \dots\dots\dots (1)$$

$$D^{post}(t) = \begin{cases} 1 & \text{if } t \geq 0 \\ 0 & \text{otherwise} \end{cases} \dots\dots\dots (2)$$

Based on the relationships defined in equations (1) and (2), the period $t = -1$ is dropped from both variables $D^{pre}(t)$ and $D^{post}(t)$. This step avoids perfect multicollinearity during estimation. So, the pre intervention (pre-M&As) period is defined as $t \leq -2$. The post intervention (post M&As) period begins at $t=0$ and continues after the intervention (M&As) itself. Equation (1) creates the dummy for the pre-treatment (pre-M&As) period. It captures all observations prior to intervention (M&As). Equation (2) creates the dummy for post treatment (post M&As) period. It starts at the intervention period (M&As) and includes all periods after it. This careful structuring ensures a clear distinction between the treatment (post merger) and control (pre merger) periods, preventing overlap and multicollinearity. The linear estimation framework used to formally test the differential parallel trend assumption is outlined as follows:

$$Y_{it} = \lambda_t + \mu_i + \alpha(D_{it}^{pre} * T_{it}) + \tau(D_{it}^{post} * T_{it}) + \beta'X + \varepsilon_{it} \dots\dots\dots (3)$$

In equation (3), i is the unit subscript (number of panels), and t represents the time subscript. Y_{it} is the outcome of interest, or dependent variable, λ_t are time-specific fixed effects, μ_i are the unit-specific fixed effects. The coefficient α is the coefficient of interest for the test, capturing the differences¹⁰ in the slopes during the pre-intervention period between the treatment and control groups, relative to the reference point. D_{it}^{pre} is a

¹⁰ This idea is inspired by the fact that the coefficient of the dummy variable, when used as an independent variable in a single-variable regression model, represents the difference in the average of the dependent variable across the group defined by the dummy variable. In the case of this study, the interpretation is similar, but now with the effects of other independent variables or covariates/controls partialled out or netted out.

dummy variable identifying the pre-intervention period, as specified in equation (1). T_{it} is a treatment dummy variable that indicates whether unit i has ever received the treatment (1), or not (0). The coefficient τ represents the measure of generic¹¹ average treatment effect on the treated (ATT) after the intervention, where D_{it}^{post} is defined according to equation (2), identifying the post- treatment periods. The model also includes a set of covariates, denoted by X , and their respective coefficients in the vector β . Finally, the residual of the model is represented by ε_{it} .

The objective of model (3) is to test whether the treatment and control groups have different slopes during the pre-intervention period, which is essential for validating the parallel trends assumption in a Difference-in-Differences (DiD) framework. The null hypothesis, $H_0: \alpha = 0$, suggests no significant differences in the pre-intervention trends of the two groups, implying they follow parallel trends. The alternative hypothesis, $H_A: \alpha \neq 0$, indicates differential pre-trends. This suggests a possible violation of the parallel trend assumption. If the null hypothesis is rejected, it means the treatment and control groups had different trends before the intervention. This could make the DiD estimates invalid, and also bias the estimated treatment effect. So, failing to accept the null hypothesis raises concerns about the model's reliability for measuring the treatment effect.

3.6 Difference-in-Differences (DiD) Model

This study uses a Difference-in-Differences (DiD) econometric framework to measure the causal impact of M&As on the financial performance of Nepalese MFIs using panel data. In cases like this, where random assignment is not possible, and in a non-experimental setting, DiD method is widely used in applied research to evaluate policy changes or institutional interventions. DiD compares changes in outcomes over time

¹¹ Equation (3) is a variation of the generic DiD regression model, used here to test the parallel trend assumption. Thus, the term “generic” refers to the general form of the DiD model representation.

between treatment group and control group. This helps to isolate the effect of an intervention (M&As) from other confounding factors. As discussed in the earlier section, the key assumption of the DiD framework is the parallel trends assumption. It states that without the treatment, the outcome paths of the treatment and control groups would have evolved similarly overtime. If this assumption holds, then any changes in outcomes after the intervention can be attributed to the treatment effect. As noted by Angrist and Pischke (2009), the DiD estimator removes time-invariant unobserved heterogeneity and common temporal shocks overtime. This makes it a robust tool for causal inference in observational panel data.

To empirically estimate the effect of M&As on MFIs' financial performance, the following DiD specification is estimated:

$$Y_{it} = \lambda_t + \mu_i + \beta_1 PrePost_{it} + \beta_2 Treat_{it} + \beta_3 Interaction_{it} + \beta_4 MultiTreat_{it} + \beta_5 Age_{it} + \beta_6 Inflation_{it} + \beta_7 Interest_{it} + \beta_8 Remit_{it} + \beta_9 Covid_{it} + \varepsilon_{it} \dots\dots\dots (4)$$

where i indexes individual MFIs and t denote the time period. The dependent variable¹² Y_{it} represents the financial performance measure of MFI i at time t . The terms λ_t and μ_i denote time-specific and MFI-specific fixed effects, respectively, which control for unobserved heterogeneity that is constant across MFIs or over time.

The variable *PrePost* is a binary time dummy that takes the value of 0 for the pre-merger period (before 2020Q1) and 1 for the post-merger period, with its coefficient β_1 capturing overall temporal changes affecting all MFIs. The *Treat* variable is a group indicator equal to 1 for that underwent M&As (treatment group) and 0 for non-merged MFIs (control group), with β_2 reflecting the time-invariant differences between the two

¹² This study measures financial performance across four thematic areas: Profitability (ROA, and ROE), Productivity and Efficiency (Loan Portfolio per staff), Sustainability (D/E ratio), Growth (growth loan, and growth borrower), as explained in the following section—Operationalization of Variables.

groups. The interaction term ($PrePost \times Treat$), denoted as *Interaction*, equals 1 for merged MFIs in the post-merger period and 0 otherwise. The coefficient β_3 on this interaction term represents the DiD estimator and captures the Average Treatment effect on the Treated (ATT), which is the primary parameter of interest in this study as it measures the causal impact of M&As on the financial performance of the merged MFIs.

In addition, the model includes *MultiTreat*, a dummy variable indicating MFIs that have experienced more than one merger, to account for potential cumulative effects of repeated merger activities. To reduce bias and account for different influences, like MFI-specific and macroeconomic factors, a set of control variables are included. These include *Age* (which reflects the maturity of the MFIs), *Inflation* (showing macroeconomic stability), *Interest* (representing interest rate conditions), *Remit* (capturing remittance inflows), and *Covid* (accounting for the external shock of the COVID-19 pandemic). In equation 4, the coefficients from β_5 to β_9 measure how these factors impact financial performance.

Finally, ε_{it} is the idiosyncratic error term. It captures unobservable factors not explained by the model (4). It is noted that, to ensure reliable statistical inference, standard errors robust to heteroskedasticity and within-panel correlation are required.

3.7 Operationalization of Variables

As this study measures the impact of mergers and acquisitions (M&As) on the financial performance of Nepalese microfinance institutions (MFIs), financial performance and explanatory variables are operationalized according to the Difference-in-Differences (DiD) framework. All variables are measured quarterly for each MFI using panel data. The variables are divided into dependent variables, key explanatory variables, and control variables. Descriptions of each variable type are given below.

3.7.1 Dependent Variables: Financial Performance Measures

Financial performance of MFIs (Y_{it}) is our dependent variable. In the DiD setup, it is also called as outcome of interest. The study breaks financial performance into four dimensions, namely profitability, efficiency & productivity, sustainability, and growth. For each dimension, it takes suitable indicators (ratios) based on past studies or references from chapter II. Each indicator is used separately as the dependent variable in the DiD estimations, equation 4, to measure the financial performance of MFIs.

3.7.1.1 Profitability

Two ratios, return on assets (ROA) and return on equity (ROE), are taken under the profitability dimension. ROA is calculated as net income divided by total assets. ROA is interpreted as the efficiency with which MFIs use their assets to generate earnings. ROE is calculated as net income divided by total equity. ROA measures the return generated for equity holders. The formulas for ROA and ROE are as follows:

$$ROA_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Assets_{i,t}} * 100\ %$$

$$ROE_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Equity_{i,t}} * 100\ %$$

3.7.1.2 Productivity & Efficiency

Productivity & efficiency of MFIs is measured by loan portfolio per staff (LPPS). LPPS shows staff productivity and operational efficiency. It is calculated dividing gross loan portfolio by total number of staff members. The formula is:

$$LPPS_{i,t} = \frac{Loan\ Portfolio^{13}_{i,t}}{Number\ of\ Staff_{i,t}}$$

¹³ Quarterly MFI financial figures are reported in NRs thousands (000) from the NRB database, except staff, and active borrowers (reported in numbers). Remittance is reported in millions.

3.7.1.3 Sustainability

Financial sustainability of MFIs is measured by the debt-to-equity (D/E) ratio. It reflects capital structure and financial leverage of MFIs. The D/E ratio is calculated as total liabilities divided by total equity. The formula is:

$$D/E_{i,t} = \frac{Total\ Debt_{i,t}}{Total\ Equity_{i,t}}$$

3.7.1.4 Growth

Growth in MFIs is measured using loan growth and borrower growth. Loan growth is the percentage change in the gross loan portfolio. Borrower growth is the change in the number of active borrowers. The formulas are:

$$grLoan_{i,t} = \frac{Loan\ Portfolio_{i,t} - Loan\ Portfolio_{i,t-1}}{Loan\ Portfolio_{i,t-1}} * 100\ %$$

$$grBorrow_{i,t} = \frac{Active\ Borrowers_{i,t} - Active\ Borrowers_{i,t-1}}{Active\ Borrowers_{i,t-1}} * 100\ %$$

3.7.2 Key Explanatory Variables

The key explanatory variables are constructed to identify the treatment effect of M&As under the DiD framework. *PrePost* is a binary time indicator that takes the value of 0 for the pre-merger period (prior to 2020Q1) and 1 for the post-merger period. *Treat* is a treatment group indicator equal to 1 for MFIs that underwent mergers and acquisitions during the study period and 0 for non-merged MFIs. The interaction term $PrePost \times Treat$, denoted by *Interaction*, captures MFIs that are both merged and observed in the post-merger period. The coefficient of this interaction term (*Interaction*) is of importance. It represents the causal impact of M&As on the financial performance of MFIs. In other words, it is also called as the “Average Treatment Effect on the Treated” (ATT). Similarly, *MultiTreat* is a categorical variable which is 2 for MFIs with multiple mergers, 1 for a

single merger, and 0 for no M&As. This allowing the DiD model to control for cumulative M&As effects.

3.7.3 Control Variables

Besides the inclusion of explanatory variables in the DiD model, equation 4, the study also includes macroeconomic variables (MFIs age, inflation, Interest rate, remittance) as well as a COVID-19 (Covid) indicator variable—to reduce omitted variable bias. These are MFIs specific, and macroeconomic control variables. *Age* measures the number of days since an MFI's establishment and shows MFIs maturity. *Inflation* shows changes in the general price level and controls for macroeconomic stability. *Interest* shows interest rate conditions affecting borrowing costs and lending activities. *Remit* measures remittance inflows. It is important in the Nepalese context due to its effect on household income and credit demand. *Covid* is a dummy variable. It captures the economic shocks linked with the COVID-19 pandemic.

In summary, all the variables and their methods of calculation used in this study have been discussed. Financial performance is measured using profitability (ROA and ROE), efficiency & productivity¹⁴ (LPPS), sustainability (D/E ratio) and growth (grLoan, and grBorrower). These indicators, along with the explanatory variables, and control variables discussed earlier, help evaluate the causal impact of M&As on the performance of Nepalese MFIs within a Difference-in-Differences (DiD) framework.

3.8 Validity, Reliability, and Robustness Checks

The main goal in appropriately defining, selecting, and calculating variables is to reduce errors. This study also uses other steps that add to the validity, reliability, and robustness. Internal validity improves by using the Difference-in-Differences (DiD)

¹⁴ Kharti (2014), among others, supports the inclusion of ROA, ROE, efficiency & productivity (LPPS), growth (grLoan, grBorrower), and MFI age as variables

method. It controls unobserved, time invariant institutional differences and shared time shocks that affect all MFIs. Both graphs and linear regression model are used to test the parallel trend assumption. This step is essential before running to DiD estimation.

Data are compiled from NRB database and the audited financial statements of licensed MFIs. These are trustworthy sources, as they follow consistent and standardized procedures for handling and processing data. This helps minimize measurement errors, bias, and inconsistencies. The external validity of the study is strong because of the sample including nearly all Nepalese MFIs during the study period. This makes it a near census study. Therefore, smaller samples or resample are not taken. Due to the full population nature of the data the concerns about sampling errors are insignificant. This full coverage makes the findings more applicable and meaningful for the real world of Nepalese MFIs.

Validity and reliability of the study results are ensured by running multiple tests. One of these tests checks for multicollinearity using Variance Inflation Factors (VIFs). Checks for heteroskedasticity and serial correlation are also performed. To handle dependence within panel, standard errors are clustered at the MFI level. All the standard steps for panel data analysis are followed. These steps make the results trustworthy. They also make the causal impact from the DiD method more reliable.

CHAPTER IV

RESULTS

This chapter presents the empirical findings on the impact of mergers and acquisitions (M&As) on the financial performance of microfinance institutions (MFIs) in Nepal. The DiD framework, discussed in Chapter III, is used to measure financial performance using quarterly unbalanced panel data from 2017Q3 to 2024Q4. Descriptive statistics, correlation analysis, and comparisons between merged and non-merged MFIs are presented. Similarly, results of the parallel trend assumption using both graphical and linear regression tests are also provided. After confirming the validity of the DiD method, the study presents the DiD results for each dimension of financial performance. The financial performance dimensions used are profitability, efficiency & productivity, sustainability, and growth. Necessary pre- and post-estimation diagnostic tests for unbalanced panel data, required for DiD model, are also reported. Following all of these procedures ensures the validity and reliability of the results.

4.1 Descriptive Statistics

This section provides an overview of the data used in the DiD analysis. It shows how observations are distributed across treatment (M&As) status and intervention (pre post M&As) timing. This helps to check for the sample balance and support causal inference. The dataset consists of quarterly panel data on MFIs in Nepal from 2017Q3 to 2024Q4. It covers both merged and acquired MFIs (treatment group) and non-merged MFIs (control group). Data are observed both before (pre) and after (post) the M&As of MFIs. Key descriptive statistics are also presented for the variables used in the analysis, by treatment status (M&As, non-M&As) and the intervention period (pre post M&As). These statistics help better understand the characteristics of MFIs. They show how MFIs

compare- both between merged non-merged MFIs, and across pre post M&As time. This information on distribution of observations across pre- and post-M&As periods help us clarify the panel structure over time.

Table 2

Distribution of quarters (observations) across intervention status and intervention time status

	Before	After	Total
Control	212	475	687
Treatment	330	604	934
Total	542	1,079	1,621

Note: Before = Before Intervention (M&As); After = After Intervention (M&As);
Control = MFIs not merged or acquired; Treatment = MFIs merged or acquired

Table 2 shows the distribution of quarterly¹⁵ observations across intervention groups (merged, non-merged) and intervention timing (pre, post M&As). Before the M&As, there are 542 observations (quarters), of which 212 are from control group (non-merged MFIs) and 330 to the treatment group (merged MFIs). After the M&As, the total observations (quarters) increase to 1,079. This includes 475 observations (quarters) for non-merged MFIs and 604 for merged MFIs. In total, the sample has 1,621 quarterly observations. The control group (non-Merged MFIs) has 687 observations (quarters) and 934 observations (quarters) in the treatment group (merged MFIs).

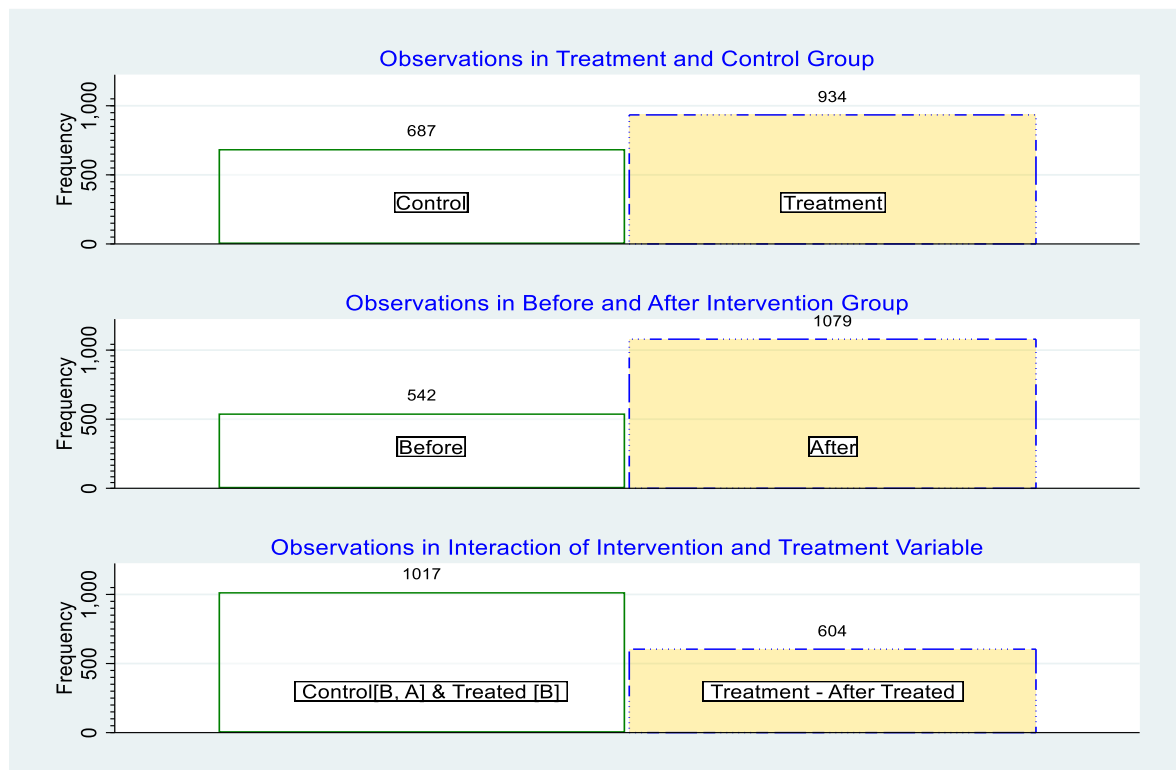
Two important aspects of the data are evident. First, both control and treatment groups are well represented in the pre- and post-intervention periods, which is a key requirement for implementing the DiD methodology. Second, the larger number of post-intervention observations reflects the longer time horizon following M&A activity, allowing the analysis to capture medium- to long-term effects of mergers and acquisitions

¹⁵ The number of quarters (observations) contributed by each microfinance institution in presented in Annex 1.

on financial performance. Although the treatment group has more observations than the control group, this imbalance is expected given the expansion of merged entities over time and does not undermine the DiD identification strategy, provided that the parallel trend assumption holds.

Figure 3

Distribution of quarters (observations) by treatment status and intervention timing



To complement the tabular presentation, Figure 3 graphically illustrates the distribution of observations across treatment status and intervention timing. The first panel compares the total number of observations between control (687) and treatment (934) MFIs, showing a higher frequency for the treatment group. The second panel contrasts observations before (542) and after (1079) the intervention, indicating a substantial increase in post-intervention observations. The third panel depicts the interaction between intervention timing and treatment status, where 604 observations belong to merged MFIs after M&As while 1017 observations include from non-merged

MFIs and merged MFIs before merger. Together, the table and figure provide a clear visual and numerical summary of the same composition, reinforcing the suitability of the dataset for subsequent DiD estimation, if parallel trend assumption holds.

Table 3

Descriptive statistics and correlations of financial performance measures

	ROA	ROE	LPPS ¹⁶	D/E	grLoan	grBorrower
Mean	0.672	9.918	1.2e+04	5.121	10.417	7.673
SD	2.138	22.414	6424.011	2.637	56.458	96.074
CV	7.905	5.615	1.308	1.279	13.723	31.712
Min	-37.173	-366.756	0.000	-4.565	-56.140	-100.000
Max	12.375	394.473	1.1e+05	17.999	1789.643	3483.333
Frequency	1620	1620	1620	1621	1560	1559
ROA	1.000					
ROE	0.284	1.000				
LPPS	0.080	0.070	1.000			
D/E	0.162	0.037	-0.195	1.000		
grLoan	-0.052	-0.038	-0.110	0.037	1.000	
grBorrower	-0.038	-0.026	-0.070	0.022	0.965	1.000

Note: Dependent variables represent measures of financial performance

Table 3 presents descriptive statistics, correlations, and observation frequencies for six financial performance variables. The results show noticeable differences across MFIs. The number of observations differs across variables: ROA, ROE, and LPPS each have 1,620 observations. D/E has 1,621, and growth variables have 1,560 observations. This is

¹⁶ Data of this study reports the Loan Portfolio in thousands (000) of NRs. Thus, in Table 3, an LPPS value of 1.2e+04 indicates that, on average, a microfinance staff member processes NRs 12,000,000 of loan portfolio per quarter.

because the first period of the sample lacks the previous values needed to calculate growth. ROA and ROE show high relative variation, with coefficients of variation (CV) of 7.905 and 5.615, respectively. This shows ROA, and ROE are very volatile compared to their mean values. LPPS and D/E are more stable, with CVs of 1.308 and 1.279. This suggests that lending intensity and leverage across MFIs are comparatively stable. Growth variables show the largest variation, as shown by CVs of 13.723 for loan growth (grLoan) and 31.712 for borrower growth (grBorrower). These numbers suggest that expansion or growth pattern of MFIs vary a lot (heterogeneity). In other words, MFIs have their own growth pattern compared to the average.

The correlation results show that most variables are only weakly related. ROA and ROE are moderately positively correlated ($r=0.284$). This suggests that performance measured by assets and by equity tends to move in the same direction, but not strongly. LPPS and D/E show weak relationships with profitability. This tells us that the size of lending and the capital structure do not have a direct impact on financial performance. Growth measures are also weakly and slightly negatively correlated with ROA and ROE. In other words, growing faster does not always mean better short-term performance. The strongest connection, in Table 3, is between loan growth and number of borrowers growth ($r = 0.965$), which is logical. In conclusion, the correlations suggests that growth indicators are closely connected with each other, and traditional financial performance indicators act independently on their own.

Table 4 shows descriptive statistics for financial performance by treatment (merged, non-merged) and intervention period (pre post M&As). The total matches with the statistics in Table 3. The descriptive statistics are mean (no brackets), standard deviation (SD, in parentheses), and coefficient of variation (CV, in square brackets). Comparison of pre- and post- intervention between the treatment group (merged MFIs)

and control group (non-merged MFIs) helps us to identify possible interaction effects.

This comparison is important for DiD analysis.

Table 4

Descriptive statistics of financial performance measures across interventions status and intervention time

	Before	After	Total
ROA (%)			
Control	0.85	0.41	0.54
	(1.79)	(3.42)	(3.02)
	[14.48]	[38.54]	[21.19]
Treatment	0.79	0.76	0.77
	(1.20)	(1.05)	(1.10)
	[8.36]	[5.67]	[4.71]
Total	0.81	0.60	0.67
	(1.46)	(2.41)	(2.14)
	[7.71]	[12.18]	[7.90]
ROE (%)			
Control	13.02	10.24	11.10
	(18.11)	(34.91)	(30.74)
	[9.55]	[15.64]	[10.56]
Treatment	9.60	8.74	9.05
	(14.69)	(12.39)	(13.25)
	[8.42]	[5.77]	[4.79]
Total	10.94	9.40	9.92
	(16.18)	(24.96)	(22.41)
	[6.35]	[8.08]	[5.61]

Note: Values are presented as mean (standard deviation, SD) [Coefficient of Variation, CV]

Continued...

	Before	After	Total
Loan Portfolio per Staff			
Control	10107.76	14946.84	13451.38
	(5408.62)	(5893.75)	(6164.75)
	[3.68]	[1.81]	[1.75]
Treatment	7419.71	13406.46	11291.23
	(3371.60)	(6758.78)	(6459.90)
	[2.50]	[2.05]	[1.87]
Total	8471.12	14083.77	12205.96
	(4477.31)	(6435.60)	(6424.01)
	[2.27]	[1.39]	[1.31]
Debt/Equity Ratio			
Control	5.45	4.84	5.03
	(2.79)	(3.16)	(3.06)
	[3.51]	[2.99]	[2.32]
Treatment	5.16	5.20	5.19
	(2.68)	(2.02)	(2.27)
	[2.85]	[1.58]	[1.43]
Total	5.28	5.04	5.12
	(2.72)	(2.59)	(2.64)
	[2.22]	[1.56]	[1.28]

Note: Values are presented as mean (standard deviation, SD) [Coefficient of Variation, CV]

Continued...

	Before	After	Total
Loan Growth (%)			
Control	19.40	4.25	8.53
	(81.76)	(10.77)	(44.84)
	[30.82]	[11.62]	[20.43]
Treatment	23.01	6.33	11.81
	(106.48)	(20.28)	(63.67)
	[26.95]	[13.05]	[17.99]
Total	21.61	5.41	10.42
	(97.56)	(16.80)	(56.46)
	[20.57]	[9.45]	[13.72]
Borrower Growth (%)			
Control	16.12	0.44	4.87
	(94.32)	(10.99)	(51.42)
	[42.79]	[115.42]	[41.03]
Treatment	24.64	2.44	9.73
	(204.30)	(20.73)	(118.65)
	[48.27]	[34.59]	[40.68]
Total	21.33	1.56	7.67
	(170.20)	(17.16)	(96.07)
	[36.34]	[33.55]	[31.71]

Note: Values are presented as mean (standard deviation, SD) [Coefficient of Variation, CV]

For ROA, the control group (non-merged MFIs) drops from 0.85% before the intervention (M&As) to 0.41% after—a decline of about 52%. The treatment group (merged MFIs) falls slightly from 0.79% to 0.76%. Dispersion rises sharply for the control group (non-merged), with the CV increasing from 14.88 to 38.54. But variability decreases for the treatment group (merged MFIs) from 8.36 to 5.67. ROE shows a similar trend. For the control group, it drops from 13.02% to 10.24%, while the treatment group goes from 9.60% to 8.74%. After the intervention, the control group becomes more varied (CV=15.64), while the treatment group sees less variation (CV=5.77). This shows that profitability is changing differently for the two groups.

Loan portfolio per staff (LPPS) grows for both groups. For the control group, it rises from NRs 10,107,660 to NRs 14,946,840. For the treatment group, it rises from NRs 7,419,710 to NRs 13,406,460. After the intervention, the treatments group has less variation (CV=2.05) compared to the control group (CV=1.81), showing more uniform growth. D/E ratios stay stable. The control group drops from 5.45 to 4.84, and the treatment group remains almost the same (5.16 to 5.20). The variability in D/E falls more for the treatment group, with CV falling from 2.85 to 1.58. This shows that their capital structure becomes more stable over time.

Growth indicators show the biggest pre-post changes. Loan growth in the control group drops sharply, from 19.40% before the intervention to 4.25% after. The treatment group also falls from 23.01% to 6.33%. Even with the drop, the treatment group keeps higher growth in both periods. The variation in loan growth also becomes smaller. The control group's CV falls from 30.82 to 11.62, while the treatment group's CV drops from 26.95 to 13.05. Borrower growth shows the same trend. The control group falls from 16.12% to 0.44%, and the treatment group from 24.64% to 2.44%. In the post period,

treatment MFIs still have higher borrower growth than controls. This shows the close link between loan and borrower growth, as noted in table 3.

To sum up, Table 4 shows clear differences between merged and non-merged MFIs before and after the M&As. Profitability drops faster for non-merged MFIs and becomes more uneven. Merged MFIs, on the other hand, stay fairly stable, and show less variation over time. Efficiency & productivity improves for both groups, but merged MFIs show more consistency growth in operations and D/E. Growth rates fall for both merged and non-merged MFIs. Yet, merged MFIs keep growing faster than non-merged MFIs in both loan and borrower growth. These patterns over time and between groups give clear reasons for using a Difference-in-Differences method of estimation. DiD can show whether the M&As caused different changes in financial performance.

Table 5 shows descriptive statistics for the independent and control variables. Each variable has 1,621 observations. The *PrePost* dummy has a mean of 0.58. This means a little more than half of the observations are from the post-M&As period. Its standard deviation is 0.49 (SD=0.49), which is high but expected for a binary variable. The *Treat* dummy has a mean of 0.67. It suggests that most of MFIs are in the treated group. The *Interaction* term has a mean of 0.37. It shows the overlap between treatment and post-intervention periods. The *MultiTreat* categorical variable has a mean of 0.76 and a maximum value of 2. This variable indicates that some MFIs were had multiple M&As history. Among continuous control variables, *Age* ranges from 425 days to 13,153 days. Its standard deviation 2,252.96 days, showing large differences, across MFIs, in operational maturity. *Inflation* varies little, with a mean of 0.05 and SD of 0.02. This suggests macroeconomic stability over the sample period. Interest rates display moderate dispersion around a mean of 11.42. *Remittances* have a high mean (2.6e+05) with notable variability, reflecting cross-sectional and temporal differences in external financial

inflows. The *Covid* dummy has a mean of 0.84, indicating that a large share of the observations coincides with the pandemic period. Coefficients of variation further confirm that dummy variables exhibit high relative dispersion, whereas macroeconomic controls such as Inflation and Interest are comparatively stable across the panel.

Table 5

Descriptive statistics and correlations of independent variables and control variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mean	0.58	0.67	0.37	0.76	2769.89	0.05	11.42	2.6e+05	0.84
SD	0.49	0.47	0.48	0.77	2252.96	0.02	1.46	61416.20	0.36
CV	2.13	1.76	3.22	2.53	2.02	0.72	0.32	0.58	1.08
Min	0.00	0.00	0.00	0.00	425.00	0.03	6.60	1.7e+05	0.00
Max	1.00	1.00	1.00	2.00	13153.00	0.08	27.38	3.8e+05	1.00
Frequency	1621	1621	1621	1621	1621	1621	1621	1621	1621
(1) PrePost	1.00								
(2) Treat	-0.05	1.00							
(3) Interaction	0.66	0.55	1.00						
(4) MultiTreat	0.11	0.00	0.09	1.00					
(5) Age	-0.16	0.20	0.02	-0.04	1.00				
(6) Inflation	-0.01	0.21	0.12	-0.01	0.09	1.00			
(7) Interest	0.03	-0.57	-0.30	-0.13	-0.17	-0.12	1.00		
(8) Remit ¹⁷	-0.07	0.61	0.29	0.01	0.26	0.30	-0.29	1.00	
(9) Covid	-0.05	0.61	0.33	-0.00	0.11	0.38	-0.37	0.44	1.00

For correlation interpretation, the study uses thresholds where $|r| = 0.0\text{--}0.3$ is weak, $|r| = 0.3\text{--}0.7$ is moderate, and $|r| = 0.7\text{--}1.0$ is strong. *PrePost* is moderately and

¹⁷ Data of this study reports Remit (Remittances) in millions of Nepalese rupees (NRs 000,000).

positively correlated with the *Interaction* term ($r = 0.66$). This is expected, as the *interaction* mechanically captures post-intervention treated observations. *Treat* is moderately and positively correlated with *Interaction* ($r = 0.55$). This reinforces the internal consistency of the DiD design. The correlation between *PrePost* and *Treat* is very weak ($r = -0.05$). This indicates that treatment assignment is not mechanically linked to the timing of the intervention. It supports the possibility of parallel trends. *MultiTreat* shows generally weak correlations with the main DiD variables ($|r| < 0.3$). This suggests that multiple treatment exposure captures an extra effect rather than repeating the core treatment effect. Similarly, for control variables, *Treat* is moderately negatively correlated with *Interest* ($r = -0.57$). It is moderately positively correlated with *Remittances* ($r = 0.61$) and *Covid* ($r = 0.61$). This shows that treated MFIs usually work in places with lower interest rates and higher remittance inflows. *Inflation* and *Interest* have weak to moderate correlations with other variables ($|r| < 0.7$). This indicates limited overlap in explanatory power.

Overall, Table 5 shows that MFIs vary a lot over time and between each other in both DiD variables and controls. This makes the data ready for panel analysis. The correlation analysis gives a first look at how the variables are related. Other diagnostics test like multicollinearity test, are also run to make sure the results are reliable. Similarly, the correlation shows moderate to strong associations mostly with DiD variables, and weak associations elsewhere. Together, these results suggest that variables are appropriate for estimating treatment effects while maintaining efficient independence among controls.

The study now presents the disaggregated descriptive statistics of control variables, excluding Covid variable, by intervention period and intervention status in Table 6.

Table 6*Description statistics of control variables across interventions status and intervention time*

	Before	After	Total
Age			
Control	2715.02	3419.83	3202.34
	(2836.87)	(2810.52)	(2835.39)
	[7.18]	[3.77]	[3.38]
Treatment	1769.19	2824.76	2451.81
	(1469.30)	(1596.41)	(1631.94)
	[4.57]	[2.30]	[2.18]
Total	2139.15	3086.73	2769.89
	(2159.89)	(2232.97)	(2252.96)
	[4.34]	[2.20]	[2.02]
Inflation			
Control	0.05	0.06	0.05
	(0.01)	(0.02)	(0.02)
	[1.59]	[1.36]	[1.09]
Treatment	0.05	0.06	0.05
	(0.01)	(0.02)	(0.02)
	[1.29]	[1.22]	[0.95]
Total	0.05	0.06	0.05
	(0.01)	(0.02)	(0.02)
	[1.00]	[0.91]	[0.72]

Note: Values are presented as mean (standard deviation, SD) [Coefficient of Variation, CV]

Continued...

	Before	After	Total
Interest			
Control	12.66	10.80	11.38
	(2.23)	(0.92)	(1.69)
	[1.21]	[0.39]	[0.57]
Treatment	12.56	10.86	11.46
	(1.09)	(0.89)	(1.26)
	[0.48]	[0.34]	[0.36]
Total	12.60	10.83	11.42
	(1.63)	(0.91)	(1.46)
	[0.56]	[0.25]	[0.32]
Remit ¹⁸			
Control	2.1e+05	2.9e+05	2.7e+05
	(19073.86)	(59364.70)	(63087.71)
	[0.62]	[0.93]	[0.90]
Treatment	2.1e+05	2.9e+05	2.6e+05
	(19688.09)	(57338.75)	(59942.97)
	[0.52]	[0.82]	[0.76]
Total	2.1e+05	2.9e+05	2.6e+05
	(19439.86)	(58307.00)	(61416.20)
	[0.40]	[0.61]	[0.58]

Note: Values are presented as mean (standard deviation, SD) [Coefficient of Variation, CV]

¹⁸ *Remit* (Remittances) is reported in millions of Nepalese rupees (NRs 000,000).

Table 6 shows descriptive statistics for key control variables: *Age*, *Inflation*, *Interest rate*, and *Remittances*. The data is disaggregated across intervention groups and periods. *Age* differs systematically across groups. Before the intervention, control MFIs are older on average (mean=2,715 days; CV=7.18) than treated MFIs (mean=1,769 days; CV=4.75). After the intervention, mean age increases for both groups (controls: 3,420 days; treatment: 2,825 days). Similarly, relative dispersion in age declines, especially for treated MFIs (CV falls to 2.30). This shows that MFIs become more similar in institutional maturity over time.

Macroeconomic control variables are very similar across groups. *Inflation* rises slightly from a mean of 0.05 (5%) before the intervention to 0.06 (6%) after, for both control and treatment MFIs. The variation is low and decreases over time (CVs fall from about 1.3-1.6 pre-intervention to around 1.2-1.4 post-intervention). This shows a stable and common price environment. *Interest rates* fall for both groups, from means near 12.6% before the intervention to about 10.8% after. Variation also drops sharply (CVs fall from 1.21 to 0.39 for controls and from 0.48 to 0.34 for treatments). This indicates financing conditions becoming more similar.

Remit (remittances) increase strongly for both groups over time. The mean rises from about NRs 2.1×10^5 million before the intervention to NRs 2.9×10^5 millions after the intervention. The means are almost the same for treatment and control MFIs. However, relative dispersion increases after the intervention period. CVs rise from 0.62 to 0.93 for controls and from 0.52 to 0.82 for treated MFIs. This shows growing differences (heterogeneity) in how MFIs are exposed to remittance inflows. Overall, the similarity in mean values and variability patterns for macroeconomic variables, across groups, supports using them as controls. This helps the DiD analysis to isolate the impact of M&As on MFIs financial performance by controlling for external economic influences.

Table 7*Correlation matrix of dependent and independent variables*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ROA	1.00	0.28	0.08	0.16	-0.05	-0.04	-0.07	0.05	0.02	0.08	0.08	-0.15	0.01	-0.26	-0.00
(2) ROE	0.28	1.00	0.07	0.04	-0.04	-0.03	-0.04	-0.05	-0.05	0.02	-0.02	-0.13	-0.02	-0.24	0.03
(3) LPPS	0.08	0.07	1.00	-0.20	-0.11	-0.07	0.39	-0.17	0.12	-0.01	0.50	0.12	-0.26	0.38	0.29
(4) D/E	0.16	0.04	-0.20	1.00	0.04	0.02	-0.06	0.03	0.02	0.03	-0.26	-0.15	-0.02	-0.16	-0.09
(5) grLoan	-0.05	-0.04	-0.11	0.04	1.00	0.96	-0.13	0.03	-0.06	0.02	-0.11	-0.10	0.06	-0.11	-0.13
(6) grBorrower	-0.04	-0.03	-0.07	0.02	0.96	1.00	-0.10	0.03	-0.04	0.01	-0.08	-0.05	0.05	-0.07	-0.10
(7) PrePost	-0.07	-0.04	0.39	-0.06	-0.13	-0.10	1.00	-0.05	0.53	0.00	0.18	0.15	-0.59	0.58	0.59
(8) Treat	0.05	-0.05	-0.17	0.03	0.03	0.03	-0.05	1.00	0.68	0.11	-0.17	-0.01	0.03	-0.07	-0.04
(9) Interaction	0.02	-0.05	0.12	0.02	-0.06	-0.04	0.53	0.68	1.00	0.09	0.00	0.08	-0.30	0.27	0.31
(10) MultiTreat	0.08	0.02	-0.01	0.03	0.02	0.01	0.00	0.11	0.09	1.00	-0.04	-0.00	-0.13	0.01	-0.00
(11) Age	0.08	-0.02	0.50	-0.26	-0.11	-0.08	0.18	-0.17	0.00	-0.04	1.00	0.07	-0.16	0.25	0.10
(12) Inflation	-0.15	-0.13	0.12	-0.15	-0.10	-0.05	0.15	-0.01	0.08	-0.00	0.07	1.00	-0.08	0.26	0.31
(13) Interest	0.01	-0.02	-0.26	-0.02	0.06	0.05	-0.59	0.03	-0.30	-0.13	-0.16	-0.08	1.00	-0.28	-0.37
(14) Remit	-0.26	-0.24	0.38	-0.16	-0.11	-0.07	0.58	-0.07	0.27	0.01	0.25	0.26	-0.28	1.00	0.40
(15) Covid	-0.00	0.03	0.29	-0.09	-0.13	-0.10	0.59	-0.04	0.31	-0.00	0.10	0.31	-0.37	0.40	1.00

Table 7 shows the correlation matrix for all study variables. Special focus is on the relationships between financial performance measures and key explanatory variables. Financial performance includes profitability (ROA, ROE), efficiency & productivity (LPPS), sustainability (D/E), and growth (grLoan, grBorrower). The independent variables include DiD treatment indicators and control variables. The preliminary analysis helps spot possible relationships before doing the formal Difference-in-Differences (DiD) estimation. It shows whether MFIs characteristics, macroeconomic conditions, or treatment exposure might influence financial performance of Nepalese MFIs.

The correlation matrix, in table 7, shows that profitability measures mostly have weak correlations with the DiD variables. ROA is slightly positive with *Treat* ($r=0.05$) and slightly negatively with *PrePost* ($r=-0.07$). ROE shows very small correlations overall. Efficiency & productivity (LPPS) show moderate positive links with *Age* ($r=0.50$) and the post-intervention period (*PrePost*, $r=0.39$). This suggests that older MFIs and the post-M&As period are associated with higher lending productivity. Sustainability (D/E) shows weak negative links with *Age* ($r = -0.26$) and LPPS ($r= -0.20$). Loan and borrower growth are strongly linked to each other ($r=0.96$) but show weak correlations with DiD and control variables. This suggests that growth patterns are mostly independent of treatment status or macroeconomic factors.

The results derived in descriptive section are explanatory and do not imply causality. They offer an early view of possible links between MFIs characteristics, treatment exposure, and financial performance. The actual impact is tested using DiD framework. This is supported by diagnostic checks and robustness tests. To sum up, the descriptive and correlational results don't infer causality. The study now presents graphical and regression tests for the parallel trend assumption, followed by DiD estimation and the results of the diagnostic checks.

Parallel Trend Assumption

In order to use DiD method, MFIs in treatment and control groups must be comparable (parallel trend) before the M&As. This ensures that any differences seen after the intervention come from treatment (M&As). They should not come from differences between the groups that already existed. MFIs cannot receive treatment (merger), and non-treatment (no merger) at the same time. Because of this, the outcomes for treated (merged) MFIs without treatment cannot be directly observed. This is approximated using results from control (non-merged) MFIs. Similarly, in the Difference-in-Differences (DiD)

framework, this need for comparability before the intervention is analyzed through the parallel trend assumption. This assumption requires that treatment and control groups follow similar paths in outcome variables before the intervention. If this holds, then any differences in trends that appears after the intervention can be linked to the impact of the treatment. In this study, the parallel trend assumption is first checked using graphical inspection, as shown in Figure 4 below:

Figure 4

Graphical assessment of the parallel trend assumption



The financial performance measures used in this study are mostly ratio-based indicators. They represent key thematic areas such as profitability, efficiency & productivity, sustainability, and growth. Ratios scales numerator relative to a denominator, which can sometimes hide what is actually changing underneath. Because of this, Figure 4 looks at the pre-intervention trends of the main components used to build these ratios. This gives a clearer and more complete way to judge the parallel trend assumption. Therefore, the figure plots trends in net income (labeled as profit), total assets (ta), capital and other reserve fund (corf), loans and advances (laa), number of employees (staff), debt (borrow), active borrowers (loanMemb), and one ratio-based measure of efficiency & productivity- loan portfolio per staff (lppe). Looking at these basic components tells a clearer story. It helps determine whether treated and control MFIs were moving along similar paths before the M&As events occurred.

Figure 4 compares the pre- and post- intervention trajectories of these financial and operational variables for treated and control MFIs. The vertical dashed line marks the timing of the M&As intervention. Before the intervention (M&As), several key variables—total assets (ta), capital and other reserve funds (corf), loans and advances (laa), loan portfolio per staff (lppe), active borrowers (loanMemb), and profit—move in broadly similar ways across treatment and control groups. Though their levels are different, the pre-treatment slopes of these variables do not show clear differences. This shows that, before the intervention, trends were mostly similar for treated and control MFIs. Some variables, like staff size (staff) and borrowings (borrow), show slower adjustment and show small differences in growth. However, these differences are minor and do not indicate any clear violations of the parallel trend assumption.

To sum up, the graphical evidence provides supportive but only indicative validation of the parallel trend assumption. Visual inspection helps spot departures before

treatment, but it cannot prove that trends are statistically equivalent. For this reason, the study complements the graphical analysis with formal linear regression-based tests, for the parallel trend assumption, following the approach proposed by Riveros-Gavilanes (2023). The specific test procedures and model specifications are presented as equations (1), (2), and (3) in Chapter III (Methodology). These tests check whether pre-intervention trends are similar before moving on to the DiD estimation.

Table 8

Tests of parallel trends assumptions for financial performance variables

DepVars	Variable/Items	Coefficient	Std. error	z	p-value	Result
ROA	Dpre	0.04	0.31	0.12	0.90	H ₀ : Not Rejected
	Dpost	0.43	0.24	1.79	0.07	
	Adjusted R ²	0.41				
	Frequency	1620				
ROE	Dpre	1.57	3.95	0.40	0.69	H ₀ : Not Rejected
	Dpost	2.19	3.14	0.70	0.49	
	Adjusted R ²	0.32				
	Frequency	1620				
LPPS	Dpre	472.65	590.72	0.80	0.42	H ₀ : Not Rejected
	Dpost	-11.49	469.53	-0.02	0.98	
	Adjusted R ²	0.76				
	Frequency	1620				
D/E	Dpre	0.07	0.34	0.19	0.85	H ₀ : Not Rejected
	Dpost	-0.21	0.27	-0.78	0.43	
	Adjusted R ²	0.54				
	Frequency	1620				

Continued...

DepVars ¹⁹	Variable/Items	Coefficient	Std. error	z	p- value	Result
grLoan	Dpre	-6.40	10.42	-0.61	0.54	H ₀ : Not Rejected
	Dpost	-8.83	8.31	-1.06	0.29	
	Adjusted R ²	0.24				
	Frequency	1560				
grBorrower	Dpre	-6.23	17.98	-0.35	0.73	H ₀ : Not Rejected
	Dpost	-16.50	14.34	-1.15	0.25	
	Adjusted R ²	0.33				
	Frequency	1560				

Table 8 presents the results of regression tests assessing the parallel trends assumption for the main financial performance variables. The null hypothesis (H_0) for these tests is that there is no difference in the pre-treatment trends between the treatment (merged) and control (non-merged) groups. For each dependent variable—ROA, ROE, LPPS, D/E, grLoan, and grBorrower—the pre-treatment interaction term (Dpre) is not statistically significant at the 5% level, with p-values well above 0.05. This indicates that, prior to the merger intervention, treated and control MFIs followed similar trajectories in the outcome variables, thereby satisfying the key requirement of the Difference-in-Differences (DiD) framework that the groups be comparable before treatment. Post-treatment coefficients (Dpost) capture changes after the merger, though the main focus here is on confirming pre-treatment trend similarity.

¹⁹ “DepVars” are dependent variables (Y_{it}) measuring financial performance, as specified in equation (3).

Overall, the regression results provide formal statistical support for the graphical inspection shown in Figure 4. The lack of significant pre-intervention differences reinforces that any post-intervention divergences in financial performance can reasonably be attributed to the treatment effect rather than to pre-existing differences. Adjusted R^2 values indicate the explanatory power of each model, while sample frequencies reflect the dataset used for each outcome variable.

4.2 Difference-in-Differences (DiD) analysis and estimation results

The empirical analysis follows a structured panel-data Difference-in-Differences (DiD) framework. Prior to estimation, multicollinearity among explanatory variables is examined using the Variance Inflation Factor (VIF). Although the DiD approach inherently relies on a fixed-effects specification to account for time-invariant unobserved heterogeneity, conventional panel-data model selection tests—including the Breusch–Pagan Lagrange Multiplier (LM) test, the F-test for fixed effects, and the Hausman specification test—are conducted sequentially to ensure the appropriateness of the chosen panel data models.

The DiD model is subsequently estimated using a two-way fixed-effects framework with standard errors clustered at the panel (MFI) level, which are robust to heteroskedasticity and serial autocorrelation. Post-estimation diagnostics for heteroskedasticity, serial autocorrelation, and cross-sectional dependence are then conducted. If heteroskedasticity and/or serial autocorrelation are detected but cross-sectional dependence is not present, inference is based on cluster-robust standard errors. However, when cross-sectional dependence is detected, Driscoll–Kraay standard errors are additionally reported as a robustness measure, as they are robust to heteroskedasticity, serial correlation, and cross-sectional dependence simultaneously, thereby ensuring valid statistical inference.

Table 9*Multicollinearity test results based on VIF*

	ROA		ROE		LPPS		D/E		grLoan		grBorrower	
Variable	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Age	6.73	0.149	6.73	0.149	6.76	0.148	6.63	0.151	7.04	0.142	7.14	0.140
MultiTreat	6.51	0.154	6.5	0.154	6.53	0.153	6.55	0.153	6.84	0.146	6.86	0.146
Remit	5.88	0.170	5.88	0.170	5.88	0.170	5.89	0.170	5.26	0.190	5.24	0.191
PrePost	5.14	0.195	5.14	0.195	5.33	0.188	5.33	0.188	5.19	0.193	5.19	0.193
Interaction	4.52	0.221	4.52	0.221	4.52	0.221	4.53	0.221	4.83	0.207	4.82	0.207
Treat	2.86	0.350	2.86	0.350	2.86	0.350	2.86	0.350	2.95	0.339	2.95	0.339
Covid	2.37	0.422	2.37	0.422	2.37	0.422	2.37	0.422	2.14	0.467	2.14	0.467
Interest	2.02	0.495	2.02	0.495	2.02	0.495	2.02	0.495	2.04	0.490	2.04	0.490
Inflation	1.41	0.709	1.41	0.709	1.41	0.709	1.41	0.709	1.33	0.752	1.33	0.752
Mean VIF	4.16		4.16		4.19		4.18		4.18		4.19	

Table 9 reports the Variance Inflation Factor (VIF²⁰) diagnostics for all explanatory variables included in the Difference-in-Differences (DiD) models estimated across the different financial performance outcomes. The null hypothesis (H_0) for the VIF test is that there is no serious multicollinearity among the explanatory variables. Using the conventional threshold of VIF values below 10, and the more conservative benchmark of 5, the results indicate that all variables fall within acceptable limits. Mean VIF values remain moderate across all model specifications, and the corresponding tolerance values (1/VIF) are well above critical cutoff of 0.1, suggesting that no regressor is excessively explained by linear combinations of other variables.

²⁰ In Stata, the *estat vif* command is used to report VIF results after running a pooled OLS regression.

Generally, in panel data analysis, the pooled OLS estimator is appropriate only when panel-specific (MFI-specific) heterogeneity is absent; that is, when the variance of the individual-specific error component is zero ($\text{Var}(u_{mfi}) = 0$). When such heterogeneity exists and is assumed to be randomly distributed across cross-sectional units, a random-effects model is more appropriate, whereas a fixed-effects model treats this heterogeneity as fixed and potentially correlated with the regressors. To determine whether pooled OLS or a random-effects specification is suitable, the Breusch and Pagan (1980) Lagrange Multiplier (LM) test is employed. The LM test, implemented after estimating a random-effects model, evaluates the null hypothesis that the variance of the panel-level random effect is zero, which would imply that pooled OLS is adequate. As shown in Annex 2a, the Breusch–Pagan LM²¹ test strongly rejects this null hypothesis for all model specifications. For ROA, ROE, LPPS, D/E, loan growth, and borrower growth, the test statistics are large and statistically significant ($p = 0.00$), indicating the presence of substantial unobserved heterogeneity across MFIs. These results demonstrate that pooled OLS estimation is inappropriate and provide empirical support for the use of a random-effects panel data model for all dependent variables.

To assess whether a fixed-effects specification is needed, the F-test for individual (MFI-specific) effects was conducted, where the null hypothesis states that all individual-specific effects are zero ($H_0: u_1 = u_2 = \dots = u_{59} = 0$), implying that pooled OLS is sufficient. The test was performed by first estimating a fixed-effects model and then evaluating the F-statistic for the joint significance of the 59 individual effects. As shown in Annex 2b, the F-test strongly rejects this null hypothesis across all dependent variables. The F-statistics range from 1.83 (for loan growth) to 44.46 (for LPPS), with all

²¹ After running the random-effects model, the *xttest0* command is used in Stata to perform the Breusch and Pagan (1980) Lagrange Multiplier (LM) test.

corresponding p-values effectively equal to zero ($p < 0.01$), indicating that the individual-specific effects are statistically significant. These findings demonstrate the presence of substantial unobserved heterogeneity across MFIs, rendering pooled OLS estimation inappropriate and providing clear support for the use of a fixed-effects panel data model for all dependent variables.

Table 10

Hausman specification test

	ROA	ROE	LPPS	D/E	grLoan	grBorrower
Chi2 or χ^2	23.16	17.77	27.31	117.40	14.44	14.30
Degrees of freedom	6.00	6.00	6.00	6.00	6.00	6.00
χ^2 test p-value	0.00	0.01	0.00	0.00	0.02	0.03

To determine whether a fixed-effects or random-effects specification is more appropriate, the Hausman²² specification test (Hausman, 1978) is conducted. The null hypothesis of this test states that the individual-specific effects are uncorrelated with the regressors, in which case the random-effects estimator is consistent and efficient, while the fixed-effects estimator remains consistent but less efficient. As reported in Table 10, the χ^2 statistics range from 14.30 (for borrower growth) to 117.40 (for D/E), with all corresponding p-values below conventional significance levels ($p < 0.05$). These results lead to a rejection of the null hypothesis across all dependent variables, indicating that the individual-specific effects are likely correlated with the regressors. Consequently, the Hausman test provides clear evidence in favor of a fixed-effects panel data model over a random-effects specification for all financial performance and growth outcomes.

²² In Stata, the *hausman* command is used to test the difference between fixed and random estimates, helping to choose between random and fixed effects models.

Before presenting the results of the fixed-effect DiD estimation, the study presents tests such as post-estimation residual tests for heteroskedasticity, serial autocorrelation, and cross-sectional dependence. This helps select the appropriate estimation method—such as the Driscoll & Kraay (1998) standard error adjustment—if any of the underlying assumptions are violated.

Table 11

Heteroskedasticity test results

	ROA	ROE	LPPS	D/E	grLoan	grBorrower
Breusch–Pagan/Cook–Weisberg ²³ test for heteroskedasticity						
chi2 (df)	1215.80	83.89	295.41	104.76	2797.37	4337.62
df	1.00	1.00	1.00	1.00	1.00	1.00
Prob>chi2	0.00	0.00	0.00	0.00	0.00	0.00
Modified Wald ²³ test for groupwise heteroskedasticity in fixed effect regression model						
Wald or chi2 (df)	16375.31	28355.42	41082.53	8185.49	1.7e+06	3.3e+07
Df	60.00	60.00	60.00	60.00	60.00	60.00
Prob>chi2	0.00	0.00	0.00	0.00	0.00	0.00

Table 11 reports the results of two heteroskedasticity tests: the Breusch & Pagan (1979) and Cook & Weisberg (1983) test, and the modified Wald test for groupwise heteroskedasticity in fixed-effects regression models as proposed by Greene (2000). The Breusch–Pagan/Cook–Weisberg test yields statistically significant chi-square statistics at the 1% level for all dependent variables (ROA, ROE, LPPS, D/E, grLoan, and grBorrower), indicating the presence of heteroskedasticity in the regression residuals.

²³ In Stata, the Breusch–Pagan/Cook–Weisberg and modified Wald tests were performed using the *estat hettest* and *xttest3* commands, respectively, after the fixed-effects model.

Consistently, the modified Wald test also reports highly significant Wald (chi-square) statistics at the 1% level across all model specifications, providing strong evidence of groupwise heteroskedasticity across cross-sectional units (MFIs) in the fixed-effects framework. Overall, these findings reject the null hypothesis of homoskedasticity and confirm that heteroskedasticity is a prominent feature of the data, necessitating the use of heteroskedasticity-robust inference in subsequent estimations.

Table 12

Wooldridge²⁴ test for autocorrelation in panel data

	ROA	ROE	LPPS	D/E	grLoan	grBorrower
df1	1.00	1.00	1.00	1.00	1.00	1.00
df2	59.00	59.00	59.00	59.00	59.00	59.00
F(df1, df2)	153.00	5.56	7.46	44.00	6.09	8.87
Prob > F	0.00	0.02	0.00	0.00	0.02	0.00

Note: df1 = df associated with the restriction being tested; df2 = df associated with error term (residual).

Table 12 reports the results of the Wooldridge (2002) test for first-order serial autocorrelation in panel data for the MFI-level panel. The null hypothesis of this test is that there is no first-order autocorrelation in the idiosyncratic error term. The reported F-statistics are statistically significant for all model specifications—ROA, ROE, LPPS, D/E, grLoan, and grBorrower—with p-values below the 5% level, and in most cases at the 1% level. These results lead to a rejection of the null hypothesis of no serial autocorrelation,

²⁴ In Stata, the Wooldridge test for autocorrelation was performed using the *xtserial* command.

indicating the presence of first-order autocorrelation in the residuals across MFIs over time.

Table 13

Pesaran's test of cross-sectional independence

	ROA	ROE	LPPS	D/E	grLoan	grBorrower
Pesaran						
(Z)	79.15	84.00	8.29	10.12	50.65	61.32
Prob > Z	0.00	0.00	0.00	0.00	0.00	0.00

Table 13 presents the results of Pesaran's²⁵ (2004) test of cross-sectional independence for the MFI-level panel across different financial performance specifications, including ROA, ROE, LPPS, D/E, grLoan, and grBorrower. The null hypothesis of the test is that the residuals are cross-sectionally independent across MFIs. The reported Z-statistics are large and statistically significant for all model specifications, with p-values equal to 0.00, leading to a clear rejection of the null hypothesis at the 1% significance level. This indicates strong cross-sectional dependence among MFIs, suggesting that common shocks or unobserved factors simultaneously influence multiple institutions.

The post-estimation residual diagnostic reported in Tables 11 through 13 confirm that MFI panel exhibits significant departures from the classical assumptions of the fixed-effects model. Specifically, the Breusch–Pagan/Cook–Weisberg and modified Wald tests (Table 11) reveal the presence of both general and groupwise heteroskedasticity, the Wooldridge (2002) test (Table 12) detects first-order serial correlation within MFIs, and

²⁵ In Stata, the Pesaran (2004) test for cross-sectional independence was performed using the *xtcsd, pesaran* command after the fixed-effects model.

Pesaran's (2004) test (Table 13) confirms strong cross-sectional dependence across MFIs. These findings suggest that conventional fixed-effects standard errors might be misleading. They could be biased and inconsistent in this setting. To address this, the study presents the DiD estimation results using Driscoll and Kraay (1998) standard errors. It is robust to heteroskedasticity, serial correlation, and cross-sectional dependence, giving more reliable statistical results even when the data have these complications.

As the data show signs of heteroskedasticity, serial autocorrelation, and cross-sectional dependence, the DiD estimates are presented both with and without these robustness corrections. Table 14 shows the estimates without corrections, and Table 15 show them with the adjustments for these violations. The study then looks closely at the results, focusing on how M&As affect the financial performance of Nepalese MFIs.

Table 14 reports DiD fixed-effects estimates without robust corrections. The *PrePost* coefficient (β_1) measures the average post-merger time effect for all MFIs. The effect of ROA is -0.01 and statistically insignificant, implying no meaningful change in profitability after the merger period. ROE increases by 3.22 percentage points but remains insignificant. LPPS increases significantly by NRs 2,330.77 thousand ($p < 0.01$), indicating a strong post-period improvement in staff productivity. The effect on D/E is -0.01 and insignificant. Loan growth declines significantly by 11.50 percentage points ($p < 0.05$), while borrower growth declines by 11.80 percentage points but remains statistically insignificant.

The *Treat* coefficient (β_2) captures pre-merger differences between treated (merged) and control (non-merged) MFIs.

Table 14*Difference-in-Differences (DiD) fixed-effects (within) regression results*

		ROA	ROE	LPPS	D/E	grLoan	grBorrower
PrePost	β_1	-0.01 (0.19)	3.22 (2.08)	2330.77*** (485.70)	-0.01 (0.24)	-11.50** (5.51)	-11.80 (9.47)
Treat	β_2	0.34*** (0.12)	-2.03 (1.34)	-637.56** (313.10)	0.21 (0.16)	0.67 (3.47)	0.17 (5.95)
Interaction	β_3	0.47*** (0.16)	2.75 (1.76)	2112.21*** (411.32)	0.61*** (0.21)	-1.43 (4.61)	-3.42 (7.91)
MultiTreat	β_4	0.10 (0.09)	0.04 (0.91)	-662.86*** (213.29)	-0.18* (0.11)	1.08 (2.43)	1.93 (4.17)
Age	β_5	0.00*** (0.00)	0.00* (0.00)	1.22*** (0.06)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Inflation	β_6	-13.98*** (3.50)	-133.60*** (37.53)	2693.70 (8769.67)	-17.61*** (4.40)	-255.21*** (98.31)	-145.11 (168.89)
Interest	β_7	0.03 (0.04)	-0.22 (0.46)	-96.17 (106.96)	-0.19*** (0.05)	-1.26 (1.30)	-1.53 (2.23)
Remit	β_8	-0.00*** (0.00)	-0.00*** (0.00)	0.01*** (0.00)	-0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)
Covid	β_9	0.93*** (0.18)	10.25*** (1.96)	1609.76*** (458.82)	-0.28 (0.23)	-9.08* (5.33)	-18.18** (9.16)
Intercept	β_0	2.89*** (0.61)	38.75*** (6.52)	4462.37*** (1524.63)	10.40*** (0.76)	59.09*** (18.24)	59.18* (31.32)
Observations		1620	1620	1620	1621	1560	1559
Groups		60	60	60	60	60	60
F (9,59)		38.02	33.73	42.89	11.12	11.84	5.05
Prob>F		0.00	0.00	0.00	0.00	0.00	0.00
R ² (within)		0.13	0.09	0.51	0.10	0.03	0.02
corr(u_i, Xb)		-0.79	-0.95	-0.82	-0.83	-0.63	-0.31
Rho		0.65	0.60	0.86	0.78	0.09	0.06
SD (u_i)		2.23	26.09	7871.43	3.38	17.68	23.44
SD ε_{it}		1.63	21.10	3139.23	1.79	55.37	95.47

*** p < .01, ** p < .05, * p < .1

ROA is higher by 0.34 percentage points ($P < 0.01$) among treated MFIs, indicating superior baseline profitability, ROE is lower by 2.03 percentage points but insignificant. LPPS is significantly lower by NRs 637.56 thousand ($p < 0.05$), implying weaker operational efficiency before mergers. The D/E ratio is higher by 0.21 but insignificant. Loan growth (0.67) and borrower growth (0.17) are also insignificant.

The *interaction* term (β_3) shows the DiD estimator and measures the causal impact of M&As. ROA increases by 0.47 percentage points ($p < 0.01$). This is a meaningful gain in profitability after the merger. ROE increases by 2.75 percentage points, but the change is not statistically significant. LPPS increases by NRs 2,112.21 ($p < 0.01$), showing clear efficiency & productivity gains after M&As. The D/E ratio rises by 0.61 ($p < 0.01$), showing higher leverage after the M&As. Loan growth falls by 1.43 percentage points, while borrower growth drops by 3.42 percentage points. Both changes are not statistically insignificant.

The *MultiTreat* coefficient (β_4) shows the effect of multiple mergers. ROA increases by 0.10 but is insignificant. ROE increases slightly by 0.04 and is insignificant. LPPS drops significantly by NRs 662.86 ($p < 0.01$), suggesting reducing productivity return from multiple M&As. The D/E ratio falls by 0.18 ($p < 0.10$), showing mild deleveraging. Loan growth (1.08) and borrower growth (1.93) stay insignificant.

For control variables, *Age* (β_5) has a small positive effect on ROA and ROE (both significant at $p < 0.10$ or better). It also raises LPPS by NRs 1.22 per day). *Age* reduces the D/E ratio and growth variables at the 1% level, indicating mature MFIs are less growth-oriented. *Inflation* (β_6) significantly reduces ROA by 13.98 percentage points and ROE by 133.60 percentage points (both $p < 0.01$), lowers leverage by 17.61 ($p < 0.01$), and reduces loan growth by 255.21 percentage points ($p < 0.01$). *Interest* rates (β_7) increase leverage by 0.19 ($p < 0.01$) but do not significantly affect other outcomes. *Remittances*

(β_8) reduce ROA and ROE significantly ($p < 0.01$) but increase LPPS by 0.01 ($p < 0.01$), while reducing leverage. The COVID-19 (*Covid*) dummy (β_9) increases ROA by 0.93 percentage points, ROE by 10.25 percentage points, and LPPS by NRs 1,609.76 (all $p < 0.01$), but reduces loan growth by 9.08 percentage points ($p < 0.10$) and borrower growth by 18.18 percentage points ($p < 0.05$).

Similarly, Table 15 reports the same DiD fixed-effects model using Driscoll & Kraay²⁶ (1998) standard errors which correct for heteroskedasticity, serial correlation, and cross-sectional dependence. All coefficient (β) estimates remain identical to Table 14; differences arise exclusively from differences in standard errors and associated statistical significance.

For the *PrePost* coefficient (β_1), the post-period decline in loan growth (-11.50) and borrower growth (-11.80) becomes significant ($p < 0.01$) whereas ROE, ROE, and D/E effects remain statistically insignificant.

For the *Treat* coefficient (β_2), the standard error for ROA increases, reducing its significance from the 1 percent level to 10 percent level ($p < 0.10$), while the negative effect on LPPS remains statistically significant ($p < 0.01$), reinforcing evidence of lower pre-merger efficiency and productivity among merged MFIs.

For the *interaction* term (β_3), the post-merger effect on ROA (0.47) and LPPS (NRs 2,112.21 thousand) remains statistically significant ($p < 0.01$). The effect on ROE becomes weakly significant ($p < 0.10$), while the D/E (0.61) remains statistically significant at the 5 percent level ($p < 0.05$). The effects on loan growth and borrower remain statistically insignificant.

²⁶ In Stata, Driscoll and Kraay (1998) standard errors were estimated using the *xtscc* command for each measure of financial performance and the explanatory variables (DiD variables and control variables).

Table 15*Difference-in-Differences (DiD) Fixed-Effects Results (Driscoll–Kraay SEs)*

		ROA	ROE	LPPS	D/E	grLoan	grBorrower
PrePost	β_1	-0.01 (0.25)	3.22 (2.22)	2330.77*** (566.19)	-0.01 (0.20)	-11.50*** (1.91)	-11.80*** (3.26)
Treat	β_2	0.34* (0.18)	-2.03 (1.39)	-637.56*** (142.23)	0.21 (0.19)	0.67 (0.73)	0.17 (1.02)
Interaction	β_3	0.47*** (0.11)	2.75* (1.55)	2112.21*** (325.96)	0.61** (0.30)	-1.43 (1.91)	-3.42 (2.91)
MultiTreat	β_4	0.10** (0.04)	0.04 (0.73)	-662.86*** (181.16)	-0.18 (0.19)	1.08 (1.08)	1.93 (1.33)
Age	β_5	0.00*** (0.00)	0.00* (0.00)	1.22*** (0.05)	-0.00*** (0.00)	-0.00** (0.00)	-0.00* (0.00)
Inflation	β_6	-13.98** (6.78)	-133.60* (69.02)	2693.70 (8914.71)	-17.61*** (5.07)	-255.21*** (47.31)	-145.11*** (40.56)
Interest	β_7	0.03 (0.04)	-0.22 (0.37)	-96.17 (138.17)	-0.19*** (0.04)	-1.26* (0.64)	-1.53 (1.14)
Remit	β_8	-0.00*** (0.00)	-0.00*** (0.00)	0.01** (0.00)	-0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)
Covid	β_9	0.93*** (0.26)	10.25*** (2.45)	1609.76*** (228.50)	-0.28** (0.13)	-9.08* (4.63)	-18.18* (10.41)
Intercept	β_0	2.89*** (0.61)	38.75*** (8.03)	4462.37** (2116.33)	10.40*** (0.87)	59.09*** (13.25)	59.18** (24.19)
Observations		1620	1620	1620	1621	1560	1559
Groups		60	60	60	60	60	60
F (9, 59)		37.27	30.76	293.79	48.27	22.68	8.65
Prob>F		0.00	0.00	0.00	0.00	0.00	0.00
R ² (within)		0.13	0.09	0.51	0.10	0.03	0.02
corr(u_i, Xb)		-0.79	-0.95	-0.82	-0.83	-0.63	-0.31
Rho		0.65	0.60	0.86	0.78	0.09	0.06
SD (u_i)		2.23	26.09	7871.43	3.38	17.68	23.44
SD ε_{it}		1.63	21.10	3139.23	1.79	55.37	95.47

*** p < .01, ** p < .05, * p < .1

For the *MultiTreat* coefficient (β_4), the effect on ROA becomes statistically significant at the 5 percent level ($p < 0.05$), while the effect on D/E loses significance. The negative effect on LPPS remains statistically significant ($p < 0.01$).

Among control variables, the negative effects of *inflation* (β_6) on ROA and ROE weaken to the 5 percent and 10 percent levels, respectively, while its strong negative effects on D/E and loan growth (*grLoan*) remain statistically significant ($p < 0.01$). The effect of *Interest rates* (β_7) on loan growth becomes weakly significant ($p < 0.10$), while its effect on D/E remains significant ($p < 0.01$). The COVID-19 (*Covid*) dummy (β_9) becomes significant for D/E at 5 percent level, while its negative effect on growth weakens to the 10 percent level.

Finally, and most importantly, the comparative analysis in Table 14 and 15 shows statistically significant DiD interaction terms (β_3) for ROA, LPPS, and the D/E ratio across both tables, and for ROE ($p < 0.10$) in Table 15— at the $p < 0.01$ or $p < 0.05$ levels— providing robust evidence that M&As in the Nepalese microfinance industry improved profitability, efficiency and productivity, and financial sustainability, while having no statistically significant short-run effects on loan or borrower growth.

CHAPTER V

SUMMARY, DISCUSSION, AND IMPLICATIONS

This chapter presents the major summary findings of the study in greater detail. It also provides a detailed discussion of the findings by comparing them with existing and past studies. In addition, the chapter discusses the implications and limitations of the study.

5.1 Summary of the Findings

Form 2020Q1 onwards, Nepalese MFIs experienced rapid consolidation through M&As. This happened, mainly, as the deadline to meet NRB's minimum paid-up capital requirement was closer. The resulting regulatory pressure made M&As a key policy response. This provides a valid reason to measure how M&As affected the financial performance of the Nepalese microfinance sector. Financial performance is measured using ratios across four key dimensions. They include profitability (ROA, ROE), efficiency & productivity (LPPS), sustainability (D/E), and loans portfolio specific growth (grLoan, grBorrower).

The first Quarter of 2020 (2020Q1) is used as a clear cutoff to define two policy periods. Quarters before this cutoff are considered as pre-M&As, and those after as post-M&As. MFIs are also classified into two groups: treatment (merged) and control (non-merged). The interaction term of these treatment groups and periods, in a DiD framework, provides the causal impact of M&As on the financial performance of MFIs. The findings are based on quarterly panel data from 2017Q3 to 2024Q4. The dataset has 1621 observations from 60 retail MFIs. Four wholesale MFIs are excluded from the analysis.

The study followed a step-by-step approach to analyze the data. First, descriptive and correlational analysis were used to identify early patterns and relationships among the

variables. Next, pre-diagnostic tests, including the parallel trend test were performed. This was followed by pre-estimation checks, model selection, estimation, and post-estimation diagnostics. The descriptive results showed noticeable variation across the DiD variables. The correlational results showed weak, with a few moderate, relationships. These patterns indicate associations, but they do not imply causal relationships.

The pre-diagnostics and pre-estimation test, including VIFs and parallel trend tests, allowed to proceed for model selection by ruling out serious multicollinearity ($VIF < 4.5$) and validating the pre-intervention parallel trends of both merged and non-merged MFIs, respectively. For model selection, the Breusch and Pagan (1980) Lagrange Multiplier (LM) test favored the random-effects model over pooled OLS, while the F-test supported the fixed-effects model over pooled OLS. Finally, the Hausman (1978) specification test favored fixed-effects model as the preferred specification, acknowledging the prevalence of MFI-specific heterogeneity.

After estimating the DiD fixed-effects (within) model, the post-estimation diagnostics—including the Breusch–Pagan/Cook–Weisberg test for heteroskedasticity, the Modified Wald test for groupwise heteroskedasticity in fixed-effects regression, the Wooldridge test for autocorrelation in panel data, and Pesaran's test for cross-sectional independence—were conducted. These tests confirmed the presence of heteroskedasticity, serial autocorrelation, and cross-sectional dependence, rendering the initial DiD estimates inefficient. Consequently, Driscoll and Kraay (1998) standard errors, which are robust to these violations, were reported for the final analysis.

The main DiD variable, the interaction term- *Interaction* (β_3)—shows the causal impact of M&As. It was significant for several financial performance measures: ROA and LPPS were significant at the 1 percent level. D/E was significant at 5 percent level. ROE was significant at the 10 percent level. These results show that M&As, among MFIs, in

Nepal had a positive impact. Profitability (ROA, ROE), efficiency & productivity (LPPS), and sustainability (D/E) all improved after M&As.

5.2 Discussions

This study measured financial performance using four key thematic dimensions. Profitability was measured by ROA and ROE. Efficiency & productivity were measured by LPPS. Sustainability was measured by D/E. Loan portfolio specific growth were measured by grLoan, and grBorrower. The results show a clear pattern. The first three dimension, namely profitability, efficiency & productivity, and sustainability showed significant positive effects after M&As. But loan portfolio specific growth variables were insignificant. Both grLoan and grBorrower showed a slight decline after M&As. As most financial performance dimensions, 3 out of 4, showed a positive impact, our findings support the efficiency theory of M&As. This theory suggests that M&As are done to realize synergies, economies of scale, and improved managerial efficiency (Trautwein, 1990).

Empirical evidence on the effects of M&As on MFIs is still limited. Studies using a DiD framework are especially rare. Most existing literature focuses on BFIs or a few MFIs. The results are mixed and mostly inconclusive. They also rely on methods other than DiD. For instance, Adhikari, Kavanagh, and Hampson (2023) find improvements in profitability (ROA, ROE) but not significant effects on sustainability (D/E). Similarly, Zuhri et al. (2020) show significant effects on sustainability but no change in profitability outcomes (ROE). Ansari et al. (2021) report no significant effects on either profitability or sustainability. Also, Variables like LPPS and loan portfolio specific growth variables (grLoan, grBorrower) are recognized as indicators of financial performance (Kharti, 2014; Richardson, 2019). However, empirical studies using these variables, in a DiD framework, are mostly absent. This makes the present study a useful benchmark for future research. It

adds evidence not only for Nepalese MFIs but also for a broader set of (financial) institutions.

The study now discusses the key findings on financial performance, followed by an analysis of the MFI-specific and macroeconomic control variables (Table 14 and 15).

Profitability (ROA, ROE): The interaction term (β_3) is positive and significant for both ROA and ROE. This shows that merged MFIs became more profitable after M&As compared to non-merged MFIs. The post-merger time dummy (β_1) is insignificant for both ROA or ROE. This means the improvement, in profitability, was not due to general economic or MFIs' industry-wide changes. The treatment dummy (β_2) shows weak or mixed effects. This suggests that MFIs that later merged were not more profitable than others before the M&As. It supports the idea that the M&As itself caused the improvement in profit gains. Likewise, the *MultiTreat* coefficient (β_4) for ROA remains positive and significant. This shows that MFIs taking part in multiple M&As gained added profitability over time. The effect, of *MultiTreat*, on ROE is weaker and not significant. This implies that such gains were limited by changes in the capital structure after M&As.

Efficiency and productivity (LPPS): The interaction term (β_3) is found to be strongly positive and highly significant. This shows that merged MFIs experienced significant improvement in LPPS. It suggests that M&As help strengthen internal systems, enhance monitoring, and diversify portfolio. Conversely, the negative treatment dummy (β_2), *Treat*, shows that MFIs that later merged had weaker portfolio performance before M&As. This again supports the benefits of M&As. The negative coefficient (β_4) for *MultiTreat* signals that MFIs involved in multiple M&As need careful planning. Overall, these findings suggest that MFIs should focus on policies that maintain efficiency & productivity over time.

Sustainability (D/E): The findings show that the interaction term (β_3) is positive and significant. This result indicates that merged MFIs took on more debt compared to non-merged MFIs after M&As. This may be true because M&As improved MFIs' credibility with lenders and donors, making it easier to get external funds. Another influential variable, treatment dummy (β_2) is not significant. This means merged MFIs were not more leveraged before M&As. To conclude, the post-merger rise in D/E after the M&As seems like a strategic move. Merged MFIs likely used M&As to grow and meet NRB's capital requirements, not just stick to old ways.

Growth (grLoan, grBorrower): The interaction terms (β_3) for both indicators are negative and statistically insignificant. This shows that M&As did not immediately increase lending or the client base compared to non-merged MFIs. The slowdown, however, may be temporary. It could be caused by branch restructuring, aligning lending policies, or stricter credit rules (like NRB loan limits in MFIs). Merged MFIs may also prioritize financial stability rather than rapid growth. This is true in Nepalese scenario, where the market is crowded and competition among MFIs is high.

Building on the findings from the aforementioned four financial performance dimensions, the study now proceeds with the discussion of MFIs-specific and macroeconomic control variables.

MultiTreat (β_4): Being involved in multiple M&As has a clear positive effect on ROA. This means MFIs involved in more than one M&As earn slightly higher ROA. This could be because of the learning and efficiency from past M&As experience. On the other hand, it has a negative and significant effect on LPPS. This shows that handling multiple M&As can temporarily reduce efficiency & productivity. This could be due to the added operational complexity. The effects on ROE, D/E, grLoan, and grBorrower are not significant, suggesting no clear impact on these variables.

Age (β_5): Age has a positive and significant effect on ROA, ROE, and LPPS. This shows that older MFIs have slightly higher profitability, and better efficiency & productivity. Their experience and institutional maturity might help improve management skills and staff efficiency & productivity. On the other hand, *Age* has a negative effect on D/E, loan growth, and borrower growth. This suggests that older MFIs tend to adopt more conservative financial and growth strategies, focusing on stability rather than expansion.

Inflation (β_6): Higher inflation has clear negative impact on ROA, ROE, D/E, grLoan, and grBorrower. This shows that rising inflation reduce MFIs' profitability and slow lending. Likely reasons are higher operating costs and weaker repayment capacity among borrowers. The effect on LPPS is slightly positive but not significant. This suggests that inflation does not meaningfully improve efficiency & productivity. The small rise may reflect nominal increases rather than real efficiency gains.

Interest Rate (β_7): Higher interest rates are negatively associated with D/E and grLoan. This shows that MFIs borrow and lend less when interest rates go up. The associations with ROA, ROE, LPPS, and grBorrower is mostly negative but not statistically significant. This indicates that MFIs struggle to maintain profits, sustainability, efficiency & productivity, or client growth when interest rate change.

Remittances or *Remit* (β_8): Higher remittance inflows are negatively associated with ROA, ROE, and D/E. This shows that MFIs earn slightly less profit and rely less on debt when households use remittance income instead of borrowing for short-term needs. At the same time, remittances (*Remit*) have a positive and significant effect on LPPS. This means that borrowers repay loans more reliably, which improves efficiency & productivity per staff (LPPS). The effects on loan growth and borrower growth are not statistically significant. This suggests remittances do not clearly affect lending expansion or client outreach.

Covid or COVID-19 (β_9): The *Covid* dummy shows a positive and significant association with ROA, ROE, and LPPS. This shows that profitability, and efficiency & productivity improved during the pandemic. In Nepalese context, this is likely because of NRB actions like loan restructuring, maturity extensions, and relief packages for BFIs and MFIs. These steps eased repayment pressures and temporarily stabilized financial indicators. At the same time, COVID-19 is negatively associated with D/E, grLoan, and grBorrower. This shows that MFIs acted cautiously amid higher uncertainty and risk.

Constant Term (β_0): The constant is positive and statistically significant for all financial performance measures. It represents the average baseline performance of non-merged MFIs before M&As, holding other factors constant. This shows that MFIs already had positive profitability, efficiency & productivity, D/E, and growth (grLoan, grBorrower) even without M&As, macroeconomic factors (controls), or institutional characteristics (MFIs fixed effects). The constant provides a baseline for interpreting all other effects in the model.

5.3 Conclusions

This study explored how M&As impacted the financial performance of Nepalese microfinance institutions (MFIs). It focused on four key financial performance dimensions, namely profitability, efficiency & productivity, sustainability, and growth. Using a difference-in-differences (DiD) approach, it analyzed quarterly, unbalanced panel, data from 60 retail MFIs. The dataset included 1,621 observations from 2017Q3 to 2024Q4. The findings show how M&As influenced MFIs' financial performance.

The findings show that hypotheses $H_1(1)$, $H_1(2)$, and $H_1(3)$ are supported, while $H_1(4)$ is not supported. M&As led to a noticeable increase in profitability (ROA and ROE). They also improved efficiency & productivity (LPPS). Financial sustainability (D/E) improved as well. These improvements are observed for merged MFIs compared to

non-merged ones. Overall, the results suggest that M&As helps MFIs achieve operational synergies, improve management efficiency, and gain better access to external finance.

These results support the efficiency theory of M&As.

In contrast, the findings also show that growth does not rise immediately after M&As. Loan expansion (grLoan) and borrower outreach (grBorrower) remain insignificant, and even fall slightly after M&As. This suggests that M&As first strengthen internal capacity, rather than expand lending or client numbers. In short, the study shows that M&As clearly improve profitability, efficiency & productivity, and sustainability in Nepalese MFIs. However, these gains may come with a short-term cost, as growth and outreach expansion tend to slow during early post-merger period.

5.4 Implications

5.4.1 Research Implications

Since this study examined how M&As affect the financial performance of Nepalese MFIs, it opens up several directions for future research. This study mainly focused on numerical measures of financial performance, such as profitability, efficiency & productivity, sustainability, and growth. Future studies can include non-numerical aspects as well. They can explore the employee and social sides of M&As to gain deeper insights. Some of the factors could be organizational culture, managerial decisions, staff morale, and client satisfaction. Using qualitative methods could help explain how these factors affect performance and long term sustainability.

The findings showed that, after M&As, MFIs become more profitable, efficient & productive, and financially stable. However, growth in lending and borrower outreach does not improve immediately and may take longer. Future studies can explore these delayed effects over a longer period. They can also look at external factors such as market competition, or borrower behavior, to see how they affect M&As outcomes.

Similarly, this research focused only on retailed MFIs in Nepal, which limits how widely the findings can be applied. Future studies could include other FIs as well. These may include banks, development banks, finance companies, or cooperatives. Doing so would provide a broader picture of M&As effects. Comparative studies across regions or countries could also help identify common patterns and best practices that are useful for other developing economies.

Also, future studies could expand the measures of financial performance. They could look at risk management, client retention, loan repayment quality, and social outreach. This would provide a more complete picture of post-merger success. Using both qualitative and quantitative methods would be valuable. It would show how M&As affect not just financial health, but also social impact and overall organizational well-being.

5.4.2 Practical and Policy Implications

This study offers useful insights for regulators, policymakers, and MFI managers. The findings show how M&As can change the path of Nepalese MFIs. When MFIs merge, they tend to become more profitable (ROA, ROE) and more efficient & productive (LPPS). They also manage resources better and get easier access to external funds (D/E). Regulatory like NRB can use these insights to guide strategic M&As, make effective policies, and monitor merged MFIs to ensure stability (D/E, LPPS) and competitiveness (ROA, ROE). At the same time, the study highlights a trade-off between efficiency & productivity (LPPS) gains and short-term growth (grLoan, grBorrower). While merged MFIs improve in profitability (ROA, ROE), efficiency & productivity (LPPS), and sustainability (D/E), their loan portfolio growth (grLoan) and borrower outreach (grBorrower) may slow down for a while. This slowdown happens as institutions adjust after M&As. Policymakers and managers can support this transition by giving guidance, technical support, or phased plans to balance financial performance with client outreach.

MFI managers can use our findings to improve how they run operations after M&As. In the earlier stages of M&As, they can focus on improving efficiency & productivity (LPPS), and financial sustainability (D/E, ROA, ROE). This helps MFIs stabilize performance. Growth (grLoan) and outreach (grBorrower) can come later, once operations are fully settled. Better efficiency & productivity (LPPS) can guide decisions on staffing, branch operations, management, and resource allocation.

Beyond Nepal, these findings are useful to other emerging markets too. MFIs in these countries support economic development (profitable MFIs), entrepreneurship (MFI loans), and women's empowerment (increased borrowers) through financial inclusion (growing MFIs). Governments, international development organizations, and financial inclusion programs can use these insights (stronger MFIs through M&As) to make policies. These policies can strengthen FIs while keeping financial inclusion and their social mission (welfare allocation, poverty reduction, entrepreneurship promotion etc.) intact.

5.5 Limitations of the study

This study has few limitations. The timing of M&As is not same for all MFIs, which might slightly affect the results. Also, matching MFIs observed before 2022Q3 with the 64 MFIs in that quarter could create selection bias. Using secondary data may also bring reporting inconsistencies. Some variables were not rescaled. Remittances were reported in millions instead of billions. MFI age was reported in days instead of years. Inflation was reported in decimals instead of percentages. This led to very small or very high large coefficient values. However, their significance and direction were not affected. Finally, even with the DiD method, unobserved macroeconomic shocks or sector-specific policies could still influence the results. These points should be kept in mind when interpreting the findings, and for future studies.

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ANNEX 1

Number of quarters (observations) across retail MFIs in the panel dataset

MicroFinance Institutions	Quarters	MicroFinance Institutions	Quarters
AChautari	30	Mithila	30
Aatmanirbhar	23	NADEP	30
Adarsha	18	NEPALGGB	30
Adhikhola	22	NERUDE	30
Asha	30	NESDO	24
Aviyan	21	NICA	30
BPW	19	NMB	30
CYC	24	National	30
Chhimek	30	Naya Sarathi	23
Civil	30	Nirdhan	30
DEPROSC	30	Rastra Uththan	17
Dhaulagiri	24	Sabaiko	30
Forward	30	Sadhana	27
GIME	30	Samaj	27
Ganapati	30	Samata	30
Gurans	30	Samudayik	30
Infinity	30	Shrijanshil	24
Jalapa	21	Summit	23
Jana	30	Super	20
Jeevan	24	Support	30
Kalika	30	Suryodaya Womi	30
Khaptad	11	Swabhimani	30
Kisan(NRN)	30	Swastik	24
Laxmi	30	Swawalamban	30
Mahila	25	Sworogjar	30
Mahuli	30	Unique Nepal	30
Manakamana	25	Unnati	30
Manushi	25	Upakar	24
Mero	30	Vijay	30
Mirmire	26	Wean Nepal	30
Total		1,621	

ANNEX 2a

Breusch and Pagan Lagrangian multiplier test for random effects [Pooled OLS vs. RE]

$$\text{depVar}[\text{mfi},t] = Xb + u[\text{mfi}] + e[\text{mfi},t]$$

Test: $\text{Var}(u_{\text{mfi}}) = 0$

	ROA	ROE	LPPS	D/E	grLoan	grBorrow
Df	1.00	1.00	1.00	1.00	1.00	1.00
lm ~ [Chibar2(df)]	1258.58	9.59	8076.57	4634.40	10.28	14.61
Prob > Chibar2	0.00	0.00	0.00	0.00	0.00	0.00

ANNEX 2b

Results of F-Test that all $u_i = 0$ [Pooled OLS vs. FE]

$H_0: u_1 = u_2 = \dots = u_{59} = 0$ i.e. all individual-specific effects are zero

	ROA	ROE	LPPS	D/E	grLoan	grBorrower
DF for absorbed						
effect	59.00	59.00	59.00	59.00	59.00	59.00
Residual DF	1553.00	1553.00	1553.00	1554.00	1493.00	1492.00
F for $H_0: u_i = 0$	15.56	2.13	44.46	27.85	1.83	2.98
p-value for test of u_i						
=0	0.00	0.00	0.00	0.00	0.00	0.00

ANNEX 3

Pooled linear regression results (standard errors in square brackets)

		ROA	ROE	LPPS	D/E	grLoan	grBorrower
PrePost	β_1	-0.12 (0.24)	-4.86 (3.08)	-88.24 (458.93)	-0.96*** (0.26)	-8.67 (8.31)	-11.45 (14.33)
Treat	β_2	-0.05 (0.18)	1.24 (2.31)	454.82 (343.08)	0.66*** (0.20)	1.07 (6.32)	-3.68 (10.90)
Interaction	β_3	0.07 (0.16)	-1.09 (2.03)	863.53*** (302.45)	0.18 (0.17)	-5.29 (5.46)	-11.59 (9.42)
MultiTreat	β_4	4.98*** (0.33)	-0.36 (4.29)	55.04 (638.10)	1.88*** (0.36)	28.82** (11.71)	41.48** (20.19)
Age	β_5	0.00*** (0.00)	0.01*** (0.00)	4.37*** (0.54)	0.00*** (0.00)	-0.01 (0.01)	0.00 (0.02)
Inflation	β_6	-16.64*** (3.06)	-176.29*** (39.60)	-6801.00 (5891.90)	-22.13*** (3.37)	-238.56** (104.95)	-167.35 (181.08)
Interest	β_7	-0.05 (0.04)	-0.78 (0.51)	-328.21*** (75.93)	-0.24*** (0.04)	-1.13 (1.45)	-1.52 (2.50)
Remit	β_8	-0.00*** (0.00)	-0.00*** (0.00)	-0.01*** (0.00)	-0.00*** (0.00)	0.00 (0.00)	-0.00 (0.00)
Covid	β_9	0.67*** (0.17)	6.25*** (2.21)	747.72** (329.27)	-0.30 (0.19)	-7.58 (6.03)	-19.36* (10.39)
Intercept	β_0	-4.56*** (0.92)	66.71*** (11.84)	13561.04*** (1761.04)	10.85*** (1.01)	36.91 (32.22)	52.59 (55.55)
Observations		1620	1620	1620	1621	1560	1559
R-squared		0.44	0.15	0.77	0.56	0.08	0.06
F statistic		137.6	30.55	596.60	225.07	14.92	10.30
Prob > F		0.00	0.00	0.00	0.00	0.00	0.0571

*** p < .01, ** p < .05, * p < .1

ANNEX 4

Random-effects regression model (standard errors in square brackets)

		ROA	ROE	LPPS	D/E	grLoan	grBorrower
PrePost	β_1	0.21 (0.19)	2.87 (2.14)	1347.61*** (376.57)	-0.32 (0.21)	-11.42** (5.58)	-11.80 (9.47)
Treat	β_2	0.04 (0.17)	-1.53 (1.56)	383.64 (337.80)	0.61*** (0.19)	0.64 (3.68)	0.17 (5.95)
Interaction	β_3	0.16 (0.15)	1.87 (1.84)	1126.11*** (300.56)	0.31* (0.17)	-1.89 (4.70)	-3.42 (7.91)
MultiTreat	β_4	0.25 (0.22)	0.23 (1.10)	-307.53 (692.79)	-0.04 (0.30)	1.30 (2.59)	1.93 (4.17)
Age	β_5	0.00*** (0.00)	0.00 (0.00)	1.74*** (0.22)	-0.00 (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Inflation	β_6	-13.76*** (2.88)	-132.65*** (37.08)	3550.26 (5596.83)	-17.52*** (3.18)	-255.77*** (97.98)	-145.11 (168.89)
Interest	β_7	-0.04 (0.04)	-0.40 (0.47)	-312.08*** (76.27)	-0.23*** (0.04)	-1.23 (1.32)	-1.53 (2.23)
Remit	β_8	-0.00*** (0.00)	-0.00*** (0.00)	0.01*** (0.00)	-0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)
Covid	β_9	0.88*** (0.15)	10.02*** (1.95)	1507.32*** (298.73)	0.02 (0.17)	-9.10* (5.32)	-18.18** (9.16)
Intercept	β_0	3.43*** (0.59)	40.84*** (6.73)	6707.86*** (1285.01)	10.41*** (0.68)	58.53*** (18.47)	59.18* (31.32)
Observations		1620.00	1620.00	1620.00	1621.00	1560.00	1559.00
R ² within		0.13	0.09	0.50	0.09	0.03	0.02
R ² between		0.10	0.03	0.28	0.04	0.07	0.05
R ² overall		0.11	0.08	0.37	0.07	0.04	0.02
χ^2		233.51	149.50	1588.97	150.47	55.78	27.76
p-value		0.00	0.00	0.00	0.00	0.00	0.00

*** p < .01, ** p < .05, * p < .1

ANNEX 5

Merged and non-merged MFIs across quarterly observations (2017Q3 – 2024Q4)

	Control	Treatment	Total		Control	Treatment	Total
AChautari		30	30	Mithila	30		30
Aatmanirbhar	23		23	NADEP	30		30
Adarsha		18	18	NEPALGGB	30		30
Adhikhola		22	22	NERUDE		30	30
Asha		30	30	NESDO	24		24
Aviyan	21		21	NICA		30	30
BPW		19	19	NMB	30		30
CYC		24	24	National		30	30
Chhimek	30		30	Naya Sarathi		23	23
Civil		30	30	Nirdhan	30		30
DEPROSC		30	30	Rastra Uththan		17	17
Dhaulagiri		24	24	Sabaiko		30	30
Forward	30		30	Sadhana		27	27
GIME		30	30	Samaj	27		27
Ganapati	30		30	Samata		30	30
Gurans	30		30	Samudayik		30	30
Infinity		30	30	Shrijanshil	24		24
Jalapa		21	21	Summit		23	23
Jana	30		30	Super	20		20
Jeevan		24	24	Support	30		30
Kalika		30	30	Suryodaya Womi		30	30
Khaptad		11	11	Swabhimani	30		30
Kisan(NRN)		30	30	Swastik	24		24
Laxmi	30		30	Swawalamban	30		30
Mahila	25		25	Sworojgar		30	30
Mahuli		30	30	Unique Nepal		30	30
Manakamana		25	25	Unnati		30	30
Manushi	25		25	Upakar	24		24
Mero	30		30	Vijay		30	30
Mirmire		26	26	Wean Nepal		30	30
Total					687	934	1,621

Note: Control = MFIs neither merged nor acquired; Treatment = MFIs merged or acquired.

ANNEX 6

List of MFIs acquired or merged during the sample period (2017Q3 – 2024Q4)

Sn	Merged/Acquired MFIs	Name after Merger/Acquisition
1	Buddha Jyoti, Nagbeli, Cweda, Mirmire	Mirmire
2	Suryodaya, Grameen Swayemsewak, Trilok, Nagarik, Womi	Suryodaya Womi
3	Ghodighoda, Unique Nepal	Unique Nepal
4	Deurali, Chautari, Aarambha	Aarambha Chautari
5	Nepal Sewa, Wean	Wean Nepal
6	Nepal Agro, Infinity	Infinity
7	Mahila Sahayatra, National	National
8	Sparsha, Reliable, Global IME	Global IME
9	Gharelu, Samata	Samata
10	Shaligram, CYC	CYC
11	Swadeshi, NIC Asia	NIC Asia
12	Nava Kiran, Mahuli	Mahuli
13	Mahila Samudayik, Jalpa	Jalapa
14	Janakpur, Swarojgar	Sworojgar
15	Garibi Nyunikaran, Solve, Jeevan Bikash	Jeevan Bikash
16	Smart, Manakamana	Manakamana
17	Sajeelo, Summit	Summit
18	Naya Nepal, Satyawati, Sarathi	Naya Sarathi
19	Dibya, NRN, Kisan, Rama Roshan, Creative	Kisan(NRN)
20	Sahakarya, Unnati	Unnati
21	Janasewi, Kalika	Kalika
22	Arthik Samriddhi, Sadhana	Sadhana
23	ILFCO, Civil	Civil
24	Adhikhola, CYC	CYC
25	Civil laghubitta name changed to	Himialayan Laghubitta
26	Sarathi, Vijaya	Vijaya
27	Summit, National	National
28	Adarsha, DEPROSC	DEPROSC
29	Rastra Utthan, Asha	Asha
30	Khaptad, Dhaulagiri	Dhaulagiri
31	Mirmire, Nerude	Nerude Mirmire
32	BPW, Samudayik	Samudayik
33	Sabaiko, Sadhana	Sampada
34	Manakamana, Samata gharelu	Samata gharelu
35	Jalpa, Kisan(NRN)	Matribhumi

Source: Author's compilation from various sources