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A Study on Impact of Consolidation on the Profitability of Regional Rural Banks in India

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Abstract: Consolidation in the form of mergers or amalgamation has always seemed to be an option to revive loss-making and inefficient banks or firms. Consolidation supporters argue that minimizing surplus capacity in banking will eliminate the industry of inefficient operating financial institutions. The present study aimed to empirically analyse the effect of amalgamation on the performance of regional rural banks (RRBs) in India. A paired t-test (univariate analysis) has been employed to evaluate pre- and post-amalgamation comparisons of various profitability proxies. The results revealed that return on equity increased significantly in the post-merger period. In the second stage of analysis, panel regression has been employed; the results confirmed the findings of univariate analysis and revealed a significant increase in ROE in the post amalgamation period. Hence, supporting the theories of value creation of mergers and acquisitions (M &As), the present research states that the profitability performance of regional rural banks in India has increased marginally after the M&As exercise.

1. Introduction

Continual finance is an integral part of agriculture and supplementary activities associated with agriculture as a majority of the population depends on agriculture for their livelihood in India. Traditional banking services cater primarily to the needs of the urban population; however, the authorities in India recognized the need for a separate banking institution that caters specifically to the financial needs of the rural population. The Narasimhan Committee recommended establishing an institution to address the problems and needs of the rural poor. On October 2, 1975, the Government of India established the first regional rural bank in India, intending to ensure adequate institutional finance for agriculture and its allied sectors. Regional rural banks pool funds from rural and peri-urban areas to provide credit facilities to agricultural labourers, small or marginal farmers, and rural artisans (Ibrahim, 2016). Regional rural banks (RRBs) are owned in the ratio of 50:15:35 by the Central Government, the relevant state

government, and the sponsor bank (Kumar, 2018). Over the years, regional rural banks have shown significant growth in terms of branch expansion and district coverage, but since its inception, the operational performance of RRBs has always remained under scrutiny.

Following nationalization, regional rural banks in India were projected to accelerate their branch growth, collect deposits, and offer loans to rural communities. Their motto was 'social banking,' and they paid little attention to bank efficiency and profitability. After nearly a decade of operation, regional rural banks' operational performance has pique the interest of Government and authorities. RRBs' major issues include their economic insolvency, lack of funds to mobilize, limited interest revenue, and fierce competition from commercial banks in rural finance as part of priority sector lending (Suresh, 2015). As a result, many committees were formed to gauge and improve the working of RRBs; therefore, the Indian Government, on the recommendations of Reserve Bank of India, had formed several committees from time to time to look after the problems concerned with the functioning of regional rural banks.

For improving the functioning of RRBs in India, The Vyas Committee II, an advisory committee on credit flow to agriculture and related operations, advocated two separate models in 2004: a zonal bank for RRBs in the North-East and state-level rural banks for the rest of the country and suggested the restructuring of RRBs in two phases. In the first stage, amalgamation should be done of all RRBs of the same sponsor banks to create a single unit in the state, and in the second stage, RRBs of different sponsor banks should be amalgamated. Need-based and efficient customer services were expected from amalgamated RRBs due to improved banking joint publicity/marketing efforts, branch mechanization, infrastructure, computerization, and optimum utilization of available trained and experienced workforce. It may also reap the benefits of a vast operating area [economy of scale], improved mobilization of financial resources and credit deployment, and the provision of a broader range of banking services (Kumar, 2018). In September 2005, the decision to amalgamate regional rural banks in India was taken to make them a profitable, efficient, and consolidated rural banking institution.

1.1. Rationale Behind Consolidation

Consolidation is among the most significant facets of finance and strategy research. Mergers are defined as merging two or more distinct entities into a single entity; the resulting firm might adopt any identity, such as an acquirer identity or a completely new identity (Hitt *et al.*, 2000). Acquisition, absorption, and formation into a new entity are the three types of bank consolidations (Okazaki and Sawada, 2007). When the participating banks' strength is almost equal, they are more likely to merge to form a new bank, whereas if one bank dominates the other banks, acquisition or absorption is usually a preferred route (Okazaki and Sawada, 2007). The fundamental goal of any merger, whether via purchase or consolidation, is for the amalgamated entity's total advantages to be greater than the sum of the two independent premerger banks (Pilloff, 1998). Hence, the aggregate value of the new entity must be higher than the sum of their separate combining entities. If the banks undergoing consolidation do not have a sound and leading bank, the government urges them to merge into a new consolidated bank. Consolidation supporters argue that minimizing overcapacity in banking will eliminate the industry

of inefficiently operating credit institutions, and it is seen as a critical way to achieve operational synergies. However, in the banking industry, consolidation is beneficial up to a certain size and scale (Amel *et al.*, 2004). In addition, synergies are contingent on the possibility of economies of scale and scope (Vennet, 1996). In India, regional rural banks were consolidated into a larger entity that serves a larger target audience and achieves operational synergies as well. In the Indian context, especially in the RRBs amalgamation scenario, the achievement of operational synergies has been considered a research problem. So, the present study tried to evaluate the impact of amalgamation on the profitability performance of RRBs through both univariate and multivariate analysis.

2. Review of Literature

The fundamental motivation for bank consolidation, according to industry practitioners, is improved revenues and cost reduction. As a result, much of the empirical work examining the benefits of mergers focuses on profitability and efficiency. In the Indian scenario, especially in regional rural banks, Kumar (2018) evaluated the impact of the merger on net profits and accumulated losses of RRBs in Bihar and inferred a positive impact of the merger on net profits and accumulated losses. Kumar *et al.* (2017) examined progress and changes that took place in the performance of regional rural banks in India during the pre and post-merger period and concluded that the performance of RRBs had improved after amalgamation. Das (2014) analysed the performance of the regional rural banks in the pre and post-merger period and concluded that the RRBs are performing better in the post-merger period. Gagandeep (2015) evaluated the performance of regional rural banks in Himachal Pradesh and revealed that the performance of RRBs in Himachal Pradesh had shown remarkable growth in post amalgamation years in branch expansion, deposits, loans and advances, recovery performance, and profitability growth. Chakrabarti (2013) evaluated the profit and loss of RRBs in Bihar for twelve years from 2000-01 to 2011-12 and concluded an improvement in net profits after amalgamation. Mishra (2006) investigated the RRBs performance and concluded that performance of RRBs was affected by the geographical location and sponsor bank. In addition, investments have a positive influence on the performance of profit-making RRBs.

In a dissimilar institutional environment of the Nigerian banking industry, Ajao and Emmanuel (2013) analysed the level of profitability and observed an increase in profitability from the pre to post-consolidation period. On contrary, Joshua (2010) evaluated the influence of M & As (mergers and acquisitions) on the financial efficiency of banks in Nigeria. He deduced no significant difference between the pre and post mergers and acquisitions period regarding net assets, profit after tax, and gross earnings. Kemal (2011) evaluated the effect of the merger on the profitability ratios of two banks(Royal Bank of Scotland (RBS) and ABNAMRO Bank) from 2006-to 2009 and concluded a decrease in profitability performance after the merger. Kalhoefer and Badreldin (2009) examined the performance of Egyptian banks that underwent mergers or acquisitions between 2002 and 2007, finding mixed outcomes in terms of enhanced profitability following banking reforms (mergers and acquisitions).

Occidental scholars such as Havrylchyk (2004) analysed mergers and acquisitions in Poland between 1997 and 2001 and inferred that the majority of the mergers (five out of seven cases) exhibited increased profitability. On similar lines, Rhoades (1997) stated that the consolidation resulted in considerable

cost savings, an increase in ROA, and a favourable stock price reaction. Campa and Hernando (2006) analysed the influence of merger on the performance of the European banking industry and observed significant improvements in the target banks' performance after the merger. Cornett *et al.* (2006) examined the long-term operating performance of publicly and non-publicly traded bank mergers from 1990 to 2000 and found that return on equity, assets, and net interest margin increased significantly following the merger.

On the contrary, Linder and Crane (1992) analysed the performance of all mergers of commercial banks from1982-1987 in the New England region and observed that acquired entities or banks have difficulty increasing their profitability after mergers. Vennet (1996) examined the performance effects of acquisitions and mergers between E.C. credit institutions from 1988-to 1993 and observed insignificant changes in efficiency and profitability post-merger era. In the Japanese banking industry, Okazaki and Sawada (2007) measured the influence of consolidation of banks directed by Government policy and concluded that consolidations had a substantial positive impact on the growth of deposits and a negative impact on profitability.

Prior research seems to be sceptical about the influence of mergers and acquisitions on profitability. The performance after merger majorly depends on the sample period, institutional environment, and performance of merging entities in the pre-merger period. In addition, Government intervention possessed a significant role in the fate of a merger. In India, especially in the rural banking setting, the government decided the route of the merger of regional rural banks with a motive to revive them from financial trouble. Hence, the present study primarily explores the relationship between mergers and the profitability of RRBs in India. Previous studies evaluated the impact of amalgamation on regional rural banks on a micro-level, taking few banks or focusing on a particular region. In addition, the majority of the studies taking variables to evaluate the impact of amalgamation of RRBs were confined to geographical coverage, branches, deposits, and credit. Few studies, such as Kumar (2018), Das (2014), Gagandeep (2015), and Chakrabarti (2013) measured net profits only as a proxy for the profitability of regional rural banks in the post-merger period**.** Therefore, the present study adds to the existing limited body of knowledge by evaluating the effect of amalgamation of RRBs on profitability performance under selected proxies, especially at the macro level. However, it is also likely among the few studies that assessed the impact of amalgamation using multivariate analysis, taking into account the majority of RRBs that amalgamated between 2005 and 2014.

3. Conceptual Framework and Hypotheses Development

To compare the profitability performance of amalgamated RRBs before and after amalgamation, various performance indicators are presented in Table 1, extracted from relevant amalgamation literature. Symbols A and B in the following table represent after and before amalgamation in the hypothesized outcomes column respectively.

Conventional pre-post amalgamation comparisons do not account for various bank-specific control variables, even though some control variables affect the bank's profitability performance and amalgamation. Therefore, the present study attempt to evaluate the impact of amalgamation on the profitability of merged RRBs while adjusting for the influence of other bank-specific factors, as mentioned below:

Table 1: Proxies used for Measuring Profitability Performance

Performance Indicators	*Measurement*	*Null Hypotheses*
Return on Assets (ROA)	Net Income or Profit/Total Assets	$ROA_A = ROA_B$
Return on Equity (ROE)	Net Income or Profit/ Total Equity	$ROE_A = ROE_B$
Net Interest Margin (NIM)	Net Interest Revenue/ Total Assets	$NIM_A = NIM_B$
Net Financial Margin (NFM)	Net Interest Revenue / Total Earning Assets	$NFM_A = NFM_B$
Net Margin (NM)	Net Operating Income / Total revenue	$NM_A = NM_B$

Sources: Authors' Own Compilation

Table 2: List of Variables used in Multivariate Analysis

Variables	*Description*
Dependent variable	
Profitability	Profitability includes ratios such as return on assets and return on equity.
Independent and control variables	
Amalgamation	Represented by Dummy variable which consider the value of zero(0) for period prior amalgamation and one(1) for the years after amalgamation.
Risk	Measured by dividing loans and advances from total assets,
Diversification	Calculated by dividing non-interest income or other income by total assets
Size	Natural logarithm of total assets
Efficiency	Represented by cost to income ratio (CTIR)
Liquidity	Measured by dividing liquid assets by total assets
Capitalisation	Measured by dividing total capital by total assets.

Sources: Authors' Own Compilation

3.1. Conceptual Framework

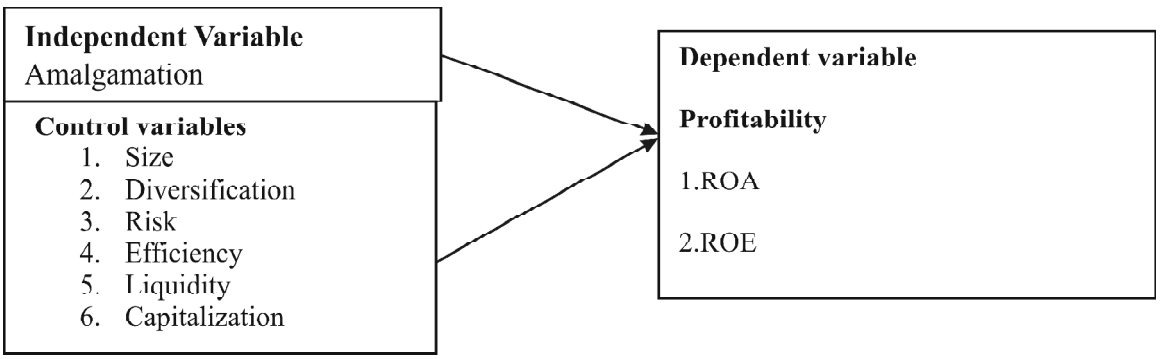

Figure 1: Research Framework of the impact of amalgamation on the profitability performance of amalgamated RRBs controlling the influence of Bank specific variables.

Source: Authors' Own Compilation

Figure 1 demonstrates the relation between amalgamation and the profitability performance of amalgamated RRBs to comprehend the interaction between the dependent and independent variables. The predicted direction of the link between dependent and independent variables is outlined below based on previous research findings.

3.2. Variables Definition and Model Specification

In banking literature, the most common proxies to evaluate profitability performance in multivariate analysis (Panel regression) are return on assets (ROA) and return on equity (ROE). ROA and ROE are taken as dependent variables based on their significance and frequent use as a proxy of profitability in recent times in order to evaluate the impact of mergers and acquisitions. Hence the present study, following the work done by various authors in the same domain, took ROA and ROE as a dependent variables to evaluate the impact of amalgamation on the same. In addition, to facilitate the comparison with previous studies, the ROA and ROE have been employed in the present study as a proxy for profitability. Following are the description and lists of various authors who have taken ROA and ROE as a proxy for profitability.

Return on Assets (ROA)

The return on assets (ROA) has been used to measure a bank's profitability. It depicts a company's earnings in relation to its assets. The higher the value of this ratio, the better the bank's performance. Studies such as Okazaki and Sawada (2007), Kolapo *et al.* (2016), Bernad *et al.* (2013) used ROA as a dependent variable for measuring profitability. Mishra (2006), Bhattacharya, and Dutta (2016) used ROA as an indicator of the profitability of Regional Rural Banks, denoted it as Net income to Total Assets (NITA). Goenka (2017) has taken ROA as a profitability indicator of regional rural banks in Rajasthan.

Return on Equity (ROE)

Return on Equity (ROE) is income earned by banking institutions concerning shareholders' equity. It is represented by net income divided by total equity. ROE demonstrates how well a bank's management uses shareholder funds. Studies such as Campa and Hernando (2006), Soyemi *et al.* (2013), Altunbas and Marques (2008) used ROE as a dependent variable to measure profitability.

3.2.1. Independent and Bank-specific Control Variables

Amalgamation and Profitability: The relationship between profitability and amalgamation has been empirically tested by various authors, researchers and scholars such as Bhattacharya and Dutta (2016) who observed improved performance of RRBs in West Bengal after amalgamation concluded that one of the possible reasons for improvement after amalgamation was greater recovery and low disbursal of farm credit. Bernad *et al.* (2013) found that profit improvements following the merger are largely reliant on the identities of the merging firms. Altunbas and Marques (2008), noted that in inter-border mergers and acquisitions, wide commonalities among merging entities are favourable to enhanced performance, while variations in deposit strategies, loan and earnings can be detrimental to performance

in domestic mergers but differences intechnology, capitalization, and innovation strategies have been proven to enhanced performance. Cornett *et al.* (2006) observed that better performance following the merger was a result of the merging firms' revenue enhancement and cost-cutting initiatives. Havrylchyk (2004) reported that five out of seven acquisitions boosted profitability through cost reduction, total factor productivity increases, or greater market power. Rhoades (1997) stated that cost-cutting due to efficient operations and efficient acquiring firm are likely to be major determinants to a merger having a positive influence on efficiency and profitability. Okazaki and Sawada (2007) observed the negative impact of consolidation on profitability due to a lack of a strategic vision for the new organisation and higher coordination costs in the case of mergers of equals due to the absence of a dominating participant. Vennet (1996) found that scale economies following the merger are the most likely explanation for enhanced operational efficiency and profit level. Linder and Crane (1992) reported a negative or insignificant impact of the merger on profitability due to low income of business when compared to competitors and integrating an different institutions with incompatible policies of management and operating processes. The researchers always seem to be dubious yet have a positive outlook about the impact of consolidation on profitability performance, so accordingly, the hypothesis has been developed.

H_{01}: There is a positive and significant impact of amalgamation on the Return on Assets of amalgamated RRBs.

H_{02}: There is a positive and significant impact of amalgamation on the Return on Equity of amalgamated RRBs.

3.2.2. Bank-specific Variables

Diversification: Bank Diversification helps financial institutions and banks to diversify their revenue sources to reduce risks or dependence on one source of income. During the 1990s financial sector reforms, RRBs were also permitted to do various non-fund business operations because the conventional financial intermediation was not lucrative for them. However, after amalgamation, RRBs were expected to extend to new geographic locations, which eventually helped them diversify their revenue operations rather than traditional intermediation. Diversification is represented by non-interest income, which includes commission, fees, and service charges divided by total assets. Goenka (2017) observed a positive and significant impact of bank diversification on RRBs' profitability in Rajasthan.

Risk: RRBs are scheduled commercial banks whose primary sources of revenue are lending and investing (Misra, 2006). Risk is represented by total credit in loans and advances by total assets; a higher level of risk entails a higher amount of profit (Cebenoyan and Strahan, 2004). As a result, the model contains a risk variable that describes the firm's operations. Misra (2006) observed positive and significant relation (FE) between advances and profitability of RRBs between 1993-and 2003. Bernad *et al.* (2013) found that the risk adopted by each savings bank in Spain improved profitability.

Size: The size of any bank, including RRBs, affects its profitability because larger banks can benefit from economies of scale. It is represented by the natural logarithm of total assets; therefore, it is expected to capture economies of scale. The structural consolidation of RRBs was also aimed to take benefits of economics of scale. Studies such by Okazaki and Sawada (2007) found a positive

relationship between size and profitability. On the other hand, Kolapo *et al.* (2016) observed an inverse relationship between the size and profitability of the bank.

Efficiency: The effectiveness of RRBs in expenditure management is an internal element that may have a major impact on their financial health (Mishra, 2006). The efficiency is represented by cost to income ratio (CTIR). While rising operational expenses are necessary to support increased company activities, rising operating costs compared to net income cause worry and show inadequate expenditure management. Hence, the cost to income ratio (CIR) is expected to negatively affect the profitability of RRBs. Mishra (2006) observed a negative influence of efficiency on the profitability of RRBs.

Liquidity: Lower rates of return are closely attributed to liquid assets. It is anticipated that increased liquidity often attracts low profitability (Molyneux and Thornton, 1992). The liquidity is represented through the liquid assets of the RRBs as a proportion of their assets. Misra (2006) observed an insignificant impact of liquidity on the profitability of RRBs.

Capitalization: A well-capitalized bank offers greater strength to function through financial crises and enhanced depositor safety under uncertain macroeconomic situations (Soyemi *et al.*, 2013). The RRB recapitalization program, which was initially implemented in 1994-95, has had an impact on profitability. The capital ratio is regarded as an essential tool for assessing a bank's safety and soundness. According to Mbizi (2012), a higher degree of capital adequacy positively impacts a bank's overall performance. Hence positive effect on profitability is expected.

To evaluate the impact of amalgamation and control the influence of bank-specific variables on the profitability of RRBs, the following regression equations have been drafted. Profitability is measured by two measures return on assets (ROA) and return on equity (ROE).

$$ROA_{it} = \alpha + \beta 1(amalgamation) + \beta 2\ (Bank\ specific\ control\ variables) + \varepsilon_{it} \qquad (1)$$

$$ROE_{it} = \alpha + \beta 1(amalgamation) + \beta 2\ (Bank\ specific\ control\ variables) + \varepsilon_{it} \qquad (2)$$

According to equations (1) & (2), the positive coefficient and sign of amalgamation exhibit a positive impact of post amalgamation dummy variable on the profitability performance of amalgamated RRBs.

4. Research Methodology

4.1. Sample and Data Collection

The sample units used in the study consist of regional rural banks established after amalgamation during 2005 to 2014. There were seventy- five merger cases between 2005-06 to 2013-2014, but after excluding remerger cases[1] , thirty- nine cases were chosen for the study(Appendix A). The analysis is based on secondary data that was manually collected from yearly financial statements of regional rural banks in India provided by the National Bank for Agriculture and Rural Development (NABARD) and the Reserve Bank of India's official website.

4.2. Tools and Techniques

Univariate tests of performance comparison have been applied to the sample units to obtain the most authentic and credible empirical results. To check if there exists any significant difference in performance

variables, consolidated premerger (pro forma) figures of merging banks are compared to the post-merger profitability of the consolidated entity. For ten years (i.e., 5 years before through 5 years after amalgamation), ratio analysis has been employed to measure different ratios for individual RRB, and amalgamation year has been considered 0. After that, the mean values of different variables for each RRB over the pre and post amalgamation windows (–5 to –1 and +1 to +5) are calculated, excluding the year of amalgamation between the pre-and post-merger periods, a paired t-test has been used. The rationale behind five years pre and post-merger is that a more extended period permits averaging the unusual expense items. In addition, to the distance from the time of the merger, it has been observed that it becomes difficult to establish a causal relationship between the merger and its consequences (Bernad *et al.,* 2013). Hence, the post-merger period of 5 years seems adequate to capture the impact of the merger on the performance of RRBs.

Further, the impact of amalgamation on the profitability performance of amalgamated sample banks was evaluated by applying panel data estimation approaches while adjusting for the impact of other bank-specific control variables. We have taken regional rural banks formed after amalgamation from 2005 to 2014. The data was analysed from a provincial panel spanning six years premerger to 5 years post-merger. The period of study is from 2000-01 to 2018-19.

5. Results and Discussion

5.1. Paired T-Test (Univariate Analysis)

Table 3 shows the empirical results obtained using a paired t-test on the sample. Empirical proxies are selected for each performance metric, and mean values are determined twice, first for five years before amalgamation and again for five years following amalgamation. Afterward, the mean values changes of each profitability proxy are presented in the table. Table 3 displays the results of the paired t-test along with p-values for determining if there are significant differences between the mean values of proxies. Since the paired t-test is a parametric test, assumptions of normality and the presence of outliers were checked. It was found that data approaches towards normality and no significant outliers were detected in the data.

Table 3: Results of Paired T-Test for Amalgamated RRBs in India

Profitability Indicators	*N*	*Mean Before Amalgamation*	*Mean After Amalgamation*	*Mean change*	*P-value*
Return on Assets (ROA)	39	1.262	1.331	0.069	0.5988
Return on Equity (ROE)	39	15.948	20.769	4.821	0.0362**
Net Interest Margin (NIM)	39	3.327	3.063	-0.264	0.0552
Net Financial Margin (NFM)	39	3.352	3.212	-0.14	0.2583
Net Margin (NM)	39	14.568	16.646	2.078	0.1358

Source: Authors' Own Calculations

Note: **Significant at 5 %.

The profitability performance of sample RRBs witnessed varied performance after amalgamation. The results of paired t-test (Table 3) reveal that there has been an increase in Return on Assets (ROA), Return on Equity (ROE), and Net margin(NM) by 0.069, 4.821, and 2.078 after amalgamation, whereas Net Interest Margin (NIM) and Net Financial Margin (NFM) has shown a decrease in the post amalgamation period by 0.264, and 0.14 respectively. Although the decrease in NIM and NFM is not statistically significant. Return on equity increased significantly in the post amalgamation period. Although from the above analysis, there is no conclusive evidence that mergers or amalgamation improve profitability because, except for ROE, no other variable showed a significant increase in the post-amalgamation period but an increase in three variables out of five signals marginal improvement of profitability performance after amalgamation.

5.2. Panel Data Analysis

To assess the appropriateness of the models presented in the study, prefatory diagnostic tests have been performed. To determine the variables' stationarity unit-root test has been carried out (Levin *et al.*, 2002). Variables involved in the study are stationary as the p-value for individual factors is inferior to 0.05. All assumptions, including multicollinearity, autocorrelation, and heteroskedasticity, have been examined and modified to ensure that the models provided in the research are appropriate. Clustered robust standard errors were reported to account for heteroskedasticity (Hoechle, 2007).

Table 4: Pairwise Correlation between Variables used in the Study

	Efficiency	*Risk*	*Liquidity*	*Capitalisation*	*Diversification*	*Size*	*Amalgamation*
Efficiency	1.0000						
Risk	-0.1950**	1.0000					
	0.0000						
Liquidity	0.0129	-0.5476**	1.0000				
	0.7893	0.0000					
Capitalisation	-0.1721**	0.1708**	-0.0774	1.0000			
	0.0003	0.0004	0.1093				
Diversification	-0.0415	0.2145**	-0.2884**	0.0308	1.0000		
	0.3908	0.0000	0.0000	0.5245			
Size	-0.1022*	0.2162**	-0.0389	-0.1504**	-0.0595	1.0000	
	0.0343	0.0000	0.4217	0.0018	0.2191		
Amalgamation	-0.1197*	0.2199**	-0.0901	-0.1214*	-0.1558**	0.5176**	1.0000
	0.0131	0.0000	0.0623	0.0119	0.0012	0.0000	
Diagnostics of Multicollinearity							
VIF	1.091	1.658	1.527	1.110	1.151	1.426	1.461

Source: Authors' Own Compilation

Note: Results from Spearman correlation coefficient have been shown in the table.

**Significance exists at 0.01 level.

* Significance exists at 0.05 level.

Table 4 displays a pairwise correlation matrix indicating the robust correlation among the variables. As can be seen from the table, variables do not have a strong correlation with each other. The excess correlation coefficient of explanatory variables above 0.80 signals the problem of multicollinearity (Kennedy, 2003). The models have proven to be devoid of multicollinearity since Variance inflation factors (VIFs) are within acceptable bounds (VIF<10).

Table 5: Prefatory Test and Model Selection

	ROA		*ROE*	
Breusch–Pagan Test (heteroskedasticity)	χ^2 (7) = 783.49	Prob > χ^2 = 0.00	χ^2 (1) =65.8587	Prob > χ^2 = 0.00
Hausman Test (Fixed Effect or Random Effect)	χ^2 (6) = 55.4411	Prob >χ^2 = 0.00	χ^2 (6) = 8.2652	Prob > χ^2 = 0.219308
Model accepted	Fixed effect		Random effect	

Source: Authors' Own Calculation

The Breusch–Pagan test was used to determine the presence of heteroskedasticity in the model. It can be seen from the results shown in Table 5 that both models have a problem of heteroskedasticity. In order to address the problem of heteroskedasticity, robust standard errors have been reported and interpreted in the study. A Durbin-Watson (D-W) test was performed to assess whether the residuals were uncorrelated. D-W test statistics less than 1 or greater than 3 were considered problematic (Field, 2013; Menard, 2002). In both models, the D-W value lies between the specified range(1-3). It indicates that the previous values of ROA/ROE (i.e., the dependent variables) have no bearing on their future values. Finally, the Hausman test has been employed to confirm the aptness of the fixed effect (FE) or random effect (RE) model. The findings of the Hausman test favour FE for ROA and RE for the ROE model.

The results of panel data analysis (shown in Table 6) indicates a statistically insignificant impact of amalgamation on the return on assets of amalgamated RRBs. While checking the relationship between amalgamation and return on assets, the coefficient of amalgamation shows a positive yet insignificant impact of amalgamation on the return on assets. The results are aligned with the findings of Okazaki and Sawada (2007), Dagogo and Okorie (2014), and Kolapo *et al.* (2016) and contradict Bernad *et al.* (2013). On analysing the relationship between amalgamation and return on equity, the post amalgamation dummy variable remains positive and significant, implying a significant increase in return on equity after amalgamation. Hence, H2 is accepted. The findings are align with the prior studies like Altunbas and Marques (2008) & Campa and Hernando (2006), who observed significant improvements in return on equity after the merger but contrary with the results of Said *et al.* (2008), who observed negative influence of merger on return on equity. The results revealed that the return on equity and return on assets of the amalgamated RRBs had benefitted from restructuring activity (M & As) initiated by the Government of India. This may be attributed to cross-organization sharing of management expertise and proper and structured implementation of the amalgamation

process. Synergies created through overhead cost-cutting may be a reason for successful M & As exercise.

Additional variables such as bank size, diversification, risk, efficiency, liquidity, and capitalization have been included in the regression equation to control the effects of bank-specific variables. Among these variables, bank size has a negative and significant effect on return on equity and return on assets. This implies that elevated assets of banks do not contribute to increasing profitability; instead, it has an adverse effect on them. The findings align with Kolapo *et al.* (2016) and Soyemi *et al.* (2013), which confirm that bank size is inversely related to profitability. Diversification has a significant positive effect on dependent variables, i.e., ROA and ROE, showing that income from other operations along with intermediation activities of banks assist in achieving enhanced profitability. Risk has a positive and significant influence on ROA and ROE. Granting loans and advances proved lucrative for the banks. Aligned with Bernad *et al.* (2013), the results revealed that risk adopted by banks has a positive impact on their profitability. The coefficient of efficiency is negative and significant, impacting ROA and ROE, which implies an increase in cost or inefficiency eventually reduces profitability, which is confirmed by Mishra (2006), who observed a negative and significant impact of efficiency on profitability of RRBs. The liquidity of banks is found to have an insignificant impact on the profitability of RRBs. Misra (2006) observed an insignificant impact of liquidity on the profitability of RRB.

Table 6: Results of Panel Data Analysis

	Dependent Variables			
Independent and Control variables	*Return on Assets(ROA)*		*Return on Equity(ROE)*	
	Coefficient(p-value)	*Robust Standard errors*	*Coefficient (p-value)*	*Robust Standard errors*
Intercept	4.644776 (0.002)***	1.383816	61.34944 (0.001) ***	17.67701
Amalgamation	0.1669875 (0.152)	0.1141282	3.755208 (0.026) **	1.687827
Size	-.2868946 (0.013)**	.1098702	-2.499941(0.006)***	.911073
Diversification	.6089085 (0.000) ***	0.1410192	8.552214 (0.000)***	1.7381
Risk	0.0153933(0.0052)***	00.007678	0.169351 (0.042)**	.0831896
Efficiency	-0.014064(0.006)***	0.0047962	-.2690205 (0.002)***	.0866295
Liquidity	-.0000725(0.985)	0.0037509	.0559255 (0.454)	.0747517
Capitalisation	0.0014326(0.947)	0.0215697	-1.284568 (0.007)***	.4794172
R^2(Within)	0.52		0.54	
Model fit	F(7, 38) = 7.71 Prob > F = 0.0000		Wald χ^2 (7) = 83.63 Prob > χ^2 = 0.0000	

Source: Authors' Own Calculations

Note: Three***, two ** asterisks indicates statistical significance at 1%, 5% and level respectively.

6. Conclusion

The present study examines the profitability performance of regional rural banks in India before and after the merger. Through paired t-test and panel data analysis, the study evaluated the effect of amalgamation on the performance represented by the profitability of merged RRBs. The empirical results provided by the univariate analysis exhibited varied performance of RRBs in terms of profitability after the merger. Selected proxies for profitability exhibit insignificant change shown by paired t test except ROE after amalgamation compared to before amalgamation. The panel data methodology signals a positive and significant impact of amalgamation on RRBs profitability (ROE) and reflects that equity return increased significantly in the post- amalgamation period. Return on assets showed positive but insignificant growth in the post-merger period. Hence, the present study supports the theories of value creation of mergers and acquisitions.

On the whole, it can be inferred from the present research that the amalgamation of RRBs, which is initiated and supervised by the Government of India, brings a marginal increase in the profitability performance of banks. The present finding supports that RRBs amalgamation results in improved ROA and ROE. However, it would entirely not be accurate to assume, on the basis of this study, that M&A activities are entirely positive for banks since some parameters show a downward trend after amalgamation. Consequently, based on the current strategy adopted by the Central Government regarding RRBs amalgamation, the study recommends the Government to decide a dominant participant or a leader bank before the amalgamation of regional rural banks. In addition, our results also revealed that diversification and credit risk have a positive and significant relationship with the profitability of RRBs; in contrast, cost inefficiency deteriorated RRBs' profitability.

The scope of this research is restricted to the limited variables that indicate profitability and their influence on mergers and acquisitions. Different proxies of profitability could be used to reconfirm the results. A cross-state analysis is suggested in future studies to validate the current study's findings. Future studies are advised to explore the impact of the second phase of amalgamation on regional rural banks or compare the first phase of amalgamation with the second phase of amalgamation.

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Appendix A

List of Regional Rural Banks formed after amalgamation during 2005-06 to 2013-14

Sr. No	*RRB formed after Amalgamation*	*Year of Amalgamation*
1.	Chaitanya Godavari Gramin Bank	2005-06
2.	Andhra Pradesh GrameenaVikas Bank	2005-06
3.	AssamGramin Vikash Bank	2005-06
4.	Karnataka Vikas GraminBank	2005-06
5.	Kashi Gomti SamyutGraminBank	2005-06
6.	PurvanchalGraminBank	2005-06
7.	SaurashtraGramin Bank	2005-06
8.	TeleganaGraminVikas Bank	2005-06
9.	Madhya Bihar GraminBank	2005-06
10.	Bihar KGB	2005-06
11.	Baroda Gujarat Gramin Bank	2005-06
12.	Dena Gujarat Gramin Bank	2005-06
13.	Haryana Gramin Bank	2005-06
14.	Pragathi GB	2005-06
15.	Vidharbha KGB	2005-06
16.	Kalinga Gramya Bank	2005-06
17.	Punjab Gramin Bank	2005-06
18.	Baroda Rajasthan Gramin Bank	2005-06
19.	Rajasthan Gramin Bank	2005-06
20.	Jaipur Thar Gramin Bank	2005-06
21.	SaptagiriGramin Bank	2006-07
22.	Andhra PragathiGramin Bank	2006-07
23.	Jharkhand Gramin Bank	2006-07
24.	VananchalGramin Bank	2006-07
25.	Pallavan Grama Bank	2006-07
26.	BangiyaGramin Bank	2006-07
27.	Paschim banga Gramin Bank	2006-07
28.	Chhattisgarh Gramin Bank	2006-07
29.	Cauvery KalpatharuGramin Bank	2006-07
30.	Madhya Bharath Gramin Bank	2006-07
31.	Narmada MalwaGramin Bank	2006-07
32.	Utkal Grama Bank	2006-07
33.	Marwar Ganganagar Bikaner Gramin Bank	2006-07
34.	AryavartGramin Bank	2006-07
35.	Shreyas Gramin Bank	2006-07
36.	Uttaranchal Gramin Bank	2006-07
37.	J & K Gramin Bank	2009-10
38.	Himachal Gramin Bank	2012-13
39.	KeralaGramin Bank	2013-14