



Exploring the New-Age Relationship of Agricultural Debt Waivers and Banks' NPA in India: A Data-Driven Review

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Abstract: This study investigates the impact of implementation strategies, borrower profiles, and program effectiveness on bank profitability within the context of agricultural debt waivers and banks' NPA. Utilizing a convenient sample of 278 bankers, three hypotheses were tested using Smart-PLS. The results reveal a significant positive relationship between implementation strategies and bank profitability (B.stat. = 0.810, T-st. = 7.021, $p < 0.001$), indicating that effective strategic execution enhances financial performance. Similarly, borrower profiles significantly influenced profitability (B.stat. = 0.548, T-st. = 6.233, $p < 0.001$), highlighting the importance of managing borrower profiles to reduce credit risk. Moreover, program effectiveness was significantly related to profitability (B.stat. = 0.458, T-st. = 2.950, $p < 0.001$), underscoring the role of effective banking programs in improving financial outcomes. These findings suggest that strategic implementation, detailed borrower profiling, and effective programs are crucial for improving bank profitability, particularly in managing NPAs arising from agricultural debt waivers.

Keywords: Non-Performing Assets (NPA), Bank Profitability, Implementation Strategies, Borrower Profiles, Program Effectiveness, Financial Performance.

I. Introduction:

In the intricate web of modern finance, the dynamics between banks and their customers are often shrouded in complexity. One such enigma lies within debt waiver programs, where financial institutions seemingly forgive portions of outstanding debts. However, beneath this facade of generosity lies a strategic calculus where banks must

navigate the delicate balance between customer satisfaction and profitability (Mishra and Verma, 2021). The phenomenon of debt waiver programs has gained prominence in recent years, particularly during economic downturns and financial crises. As individuals and businesses face mounting financial burdens, banks have increasingly turned to these programs to alleviate the strain on borrowers while simultaneously managing their own risk exposure. Yet, the underlying mechanisms by which banks maintain profitability within these programs remain elusive (Roy and Sen, 2019).

This paper seeks to unravel the intricate threads of the debt puzzle, delving into the strategies and tactics banks employ to ensure their bottom line remains intact amidst the implementation of waiver programs. We aim to shed light on the nuanced interplay between customer debt relief and financial institution profitability through a comprehensive analysis of industry practices, regulatory frameworks, and economic incentives (Khan and Ahmed, 2021). By understanding the inner workings of debt waiver programs, stakeholders ranging from policymakers and regulators to banking executives and consumers can gain valuable insights into the dynamics shaping the modern financial landscape. Furthermore, elucidating these mechanisms can foster informed decision-making and promote transparency within the financial sector, ultimately contributing to a more resilient and equitable economic environment (Dasgupta and Basu, 2023). To demystify the intricacies of debt management in banking, it is imperative to recognize the multifaceted nature of the challenges. Through rigorous analysis and empirical investigation, this paper provides a comprehensive framework for understanding how banks navigate



the complexities of debt waiver programs while safeguarding their financial interests. Examining the various strategies and mechanisms at play is crucial to delving deeper into the dynamics of debt waiver programs and how banks maintain profitability (Gaurav Kumar Singh, 2022).

One key aspect is the segmentation of customers based on risk profiles and financial behavior. Banks often categorize their borrowers into risk tiers, ranging from low-risk, high-creditworthy individuals to high-risk, financially distressed borrowers. Debt waiver programs are typically targeted towards the latter group, where the risk of default is higher. By identifying and segmenting these customers, banks can tailor their waiver offerings and repayment terms to mitigate potential losses while providing meaningful relief to those in need.

Moreover, the structure of debt waiver agreements is meticulously crafted to balance the interests of both parties involved. Banks may offer partial forgiveness of outstanding debt amounts or temporarily suspend interest accruals to provide immediate relief to borrowers. However, these concessions are often accompanied by stringent repayment schedules or revised terms and conditions that ensure the bank recoups its losses over time. Additionally, banks may negotiate with borrowers to convert unsecured debts into secured assets, reducing risk exposure (Dutta and Mukherjee, 2020).

Furthermore, the implementation of debt waiver programs is subject to regulatory oversight and compliance requirements. Banking authorities impose strict guidelines on the operation of such programs to safeguard the interests of consumers and maintain financial stability. Banks must adhere to regulatory standards regarding transparency, disclosure, and fair lending practices to ensure their waiver programs are conducted ethically and equitably. Another critical factor in maintaining profitability within waiver programs is using advanced analytics and risk management techniques. Banks employ sophisticated algorithms and predictive models to assess the creditworthiness of borrowers, forecast default probabilities, and optimize debt recovery strategies. By leveraging data analytics, banks can identify patterns of financial distress early on, intervene proactively, and tailor personalized solutions to address individual customer needs (Dadhich, M., & Tiwari, 2022).

Additionally, the strategic diversification of revenue streams is essential for banks to mitigate the inherent risks associated with debt waiver programs.

While these programs may result in short-term revenue losses from forgiven debts, banks can offset these losses through other revenue-generating activities such as fee-based services, investment banking, or wealth management. By diversifying their sources of income, banks can buffer against fluctuations in loan portfolios and maintain overall profitability.

The profitability of debt waiver programs in banking is influenced by a complex interplay of factors, including macroeconomic conditions, competitive dynamics, regulatory requirements, and technological advancements. By adopting a strategic and holistic approach to debt management, banks can navigate these challenges effectively, maintain profitability, and fulfill their dual mandate of serving borrowers' needs while safeguarding the financial system's stability. In conclusion, the profitability of debt waiver programs hinges on a delicate balance of risk management, regulatory compliance, and customer-centric strategies. By employing a holistic approach that considers borrowers' diverse needs and the institution's long-term financial viability, banks can navigate the complexities of debt management while upholding their fiduciary responsibilities and contributing to sustainable economic growth.

II. Review of Literature

(Gupta and Sharma, 2023) conducted a qualitative study exploring banks' implementation of debt waiver programs in India. The study found that debt waiver schemes provided borrowers with immediate relief but often lacked transparency and accountability. Moreover, the researchers highlighted the challenges banks face in identifying eligible beneficiaries and ensuring the equitable distribution of benefits across different segments of society. (Patel and Desai, 2020) surveyed 500 borrowers who had availed themselves of debt waiver programs offered by banks in India. The study revealed mixed perceptions among borrowers regarding the effectiveness of these programs. While some respondents expressed satisfaction with the level of debt relief received, others raised concerns about the complexity of the application process and the long-term implications for their creditworthiness. (Dadhich, Manish, Ruchi Doshi, Shalendra Singh Rao, and Renu Sharma, 2022).

(Singh and Kumar, 2019) conducted a quantitative study examining the implementation of debt waiver programs across 300 bank branches in India. The researchers found significant variations in the uptake of waiver schemes among different regions and demographic groups. Moreover, the



study highlighted the role of financial literacy and awareness campaigns in influencing borrower participation and the overall success of debt relief initiatives. (Mishra and Verma, 2021) conducted a mixed-methods study on 1000 bank customers to assess the impact of debt waiver programs on the financial well-being of bank customers in India. The findings indicated that while debt relief provided temporary respite from financial distress, many borrowers continued to face systemic challenges such as inadequate access to credit, low income levels, and limited social support networks.

(Jain and Gupta, 2020) conducted a case study analysis of select banks' debt waiver programs in India. The study revealed that while banks implemented waiver schemes to mitigate NPAs and improve asset quality, the actual impact on the banks' profitability was often limited. Moreover, the researchers identified issues related to moral hazard and adverse selection, wherein borrowers with higher default probabilities were more likely to avail themselves of debt relief, exacerbating banks' credit risk exposure. (Reddy and Chatterjee, 2023) conducted a large-scale empirical study (7000 rural borrowers) focusing on rural borrowers in India who benefited from debt waiver programs. The research revealed that while these programs succeeded in providing immediate relief to a significant number of borrowers, there were challenges in ensuring the long-term financial sustainability of the beneficiaries. Many borrowers reverted to borrowing from informal sources at high interest rates after availing themselves of debt relief, indicating underlying structural issues such as lack of access to formal credit and inadequate livelihood opportunities in rural areas.

(Banerjee and Das, 2018) surveyed 1200 MSMEs in India to assess the impact of debt waiver programs on their business operations and financial health. The study found that while debt relief provided temporary liquidity support to struggling enterprises, it did not address the structural challenges MSMEs face, such as limited access to markets, technology, and skilled labour. Moreover, the researchers highlighted the need for complementary policy measures to foster entrepreneurship, innovation, and sustainable growth among MSMEs beyond mere debt write-offs. (Roy and Sen, 2019) and (Singh, 2021) conducted a comparative analysis of debt waiver programs targeting 1500 urban borrowers in India. The study revealed variations in the design and implementation of waiver schemes across different urban centers, with some cities experiencing higher uptake rates than others.

Moreover, the researchers identified socio-economic factors such as income levels, educational attainment, and employment opportunities as significant determinants of borrower participation and program effectiveness. These findings underscored the importance of tailored interventions and localized approaches in addressing urban poverty and financial exclusion.

(Manish Dadhich; Preeti Yadav; Abhineet Saxena; Rakesh Kumar Birda; Sumit Mathur; Kamal Kant Hiran, 2023) conducted a longitudinal study tracking the impact of debt waiver programs on 800 agricultural borrowers in India over five years. The research revealed mixed outcomes, with some farmers experiencing improved debt repayment capacity and enhanced access to formal credit. In contrast, others faced challenges in rebuilding their livelihoods and overcoming systemic barriers such as land tenure issues and input market inefficiencies. The study underscored the importance of comprehensive rural development strategies addressing financial and non-financial dimensions of agricultural distress. (Khan and Ahmed, 2021) conducted a qualitative study focusing on 2000 borrowers from urban slums in India who had availed themselves of debt waiver programs. The research shed light on borrowers' unique challenges in informal settlements, including lack of formal documentation, limited awareness of banking services, and vulnerability to predatory lending practices. While debt relief provided a temporary respite from financial burdens, many borrowers remained trapped in cycles of debt due to structural constraints such as unemployment, inadequate housing, and social exclusion. The study emphasized the need for targeted interventions that address the multi-dimensional nature of poverty and empower marginalized communities to break free from the cycle of indebtedness.

(Sharma and Singh, 2022) and (Hiran & Dadhich, 2024) conducted a gender-sensitive analysis of debt waiver programs in India, focusing on 3000 women borrowers from rural and semi-urban areas. The study highlighted the differential impact of debt relief on women's economic empowerment and household welfare. While debt waiver programs allowed women to alleviate immediate financial pressures and invest in income-generating activities, they also underscored existing gender disparities in access to credit, land ownership, and decision-making power within households. The researchers advocated gender-responsive policy measures promoting women's financial inclusion, asset ownership, and leadership in economic activities. (Dasgupta and Basu, 2023)



and (Dadhich & Yadav Neetu, 2024) conducted a participatory action research study among 2500 smallholder farmers in India to assess the socio-economic impacts of debt waiver programs on agricultural livelihoods. The research revealed that while debt relief provided short-term relief to farmers affected by crop failures, it did not address the underlying vulnerabilities stemming from land degradation, water scarcity, and climate change. Moreover, the study highlighted the importance of holistic approaches integrating debt relief with agricultural extension services, crop diversification initiatives, and climate-smart farming practices to build resilience and sustainability in rural communities.

(Chakraborty and Ghosh, 2019) and (Dadhich & Bhaumik, 2023) conducted a mixed-methods study on 4000 urban poor households to examine the effectiveness of debt waiver programs in addressing urban poverty and homelessness in India. The research revealed that while debt relief provided temporary relief to families facing eviction and homelessness, it did not address the root causes of urban poverty, including lack of affordable housing, informal employment, and social protection mechanisms. The study underscored the need for integrated urban development strategies that combine debt relief with housing subsidies, livelihood support, and social welfare programs to ensure sustainable outcomes for vulnerable urban populations (Gaurav Kumar Singh & Manish dadhich, 2023). The literature review revealed that while debt waiver programs play a crucial role in providing immediate relief to borrowers in India, their long-term effectiveness hinges on addressing systemic issues such as financial inclusion, livelihood diversification, and sectoral reforms. Policymakers, regulators, and financial institutions must adopt a holistic approach that combines debt relief measures with complementary interventions to promote sustainable economic growth, enhance livelihood opportunities, and empower marginalized communities across urban and rural India. The effectiveness of banks' debt waiver programs in India hinges on addressing the multi-dimensional nature of poverty, vulnerability, and exclusion across diverse socio-economic contexts. Policymakers, practitioners, and civil society actors must adopt a rights-based approach that prioritizes the needs and aspirations of marginalized communities, empowers individuals to participate in decision-making processes, and fosters inclusive development pathways that leave no one behind.

III. Research Methodology

This study employed a quantitative research design to investigate banks' debt waiver programs in India. Quantitative techniques were utilized to gather numerical data and analyze the relationships between variables (Sonali Bhati, Manish Dadhich, 2024). A structured questionnaire was developed to collect data from banker officials administering debt waiver programs. The questionnaire was designed to gather information on various aspects of debt waiver programs, including implementation strategies, borrower profiles, program effectiveness, and profitability.

Convenience sampling was utilized to select participants for the study. Banker officials from various banks across India who were directly involved in managing debt waiver programs were invited to participate. The convenience sampling method was chosen for its practicality and accessibility in obtaining responses from relevant stakeholders. The study aimed to collect responses from 380 banker officials to ensure an adequate representation of perspectives across different banks and regions in India. Google Forms was utilized as the data collection platform to administer the structured questionnaire. The online survey allowed for efficient data collection and enabled respondents to provide their input conveniently.

The data collection period spans from February to April 2024. This timeframe was chosen to capture current insights and perspectives from banker officials regarding the implementation and impact of debt waiver programs in India. Data filtering techniques were employed to ensure the validity and reliability of the collected data. Responses were screened for completeness, consistency, and relevance to the research objectives. Any incomplete or inconsistent responses were excluded from the analysis. The collected data was analyzed using SEM with the Smart-PLS software. Smart-PLS allows for examining complex relationships between variables and provides robust statistical techniques for hypothesis testing.

Dependent and Independent Variables:

- Dependent Variable: Profitability of Banks' Debt Waiver Programs
- Independent Variables: Implementation Strategies, Borrower Profiles, Program Effectiveness

The profitability of debt waiver programs is the dependent variable, while implementation strategies, borrower profiles, and program effectiveness are independent variables influencing the profitability outcomes. These variables were examined to understand their impact on the financial



performance of debt waiver programs in Indian banks.

The research methodology outlined above aimed to provide a comprehensive understanding of the factors influencing the profitability of banks' debt waiver programs.

IV. Data Analysis And Discussion

Table 1 provides a comprehensive demographic breakdown of bankers, revealing that the majority are male (66.60%), while females constitute 33.40%. The age distribution is dominated by the 30-39 years group (29.90%),

followed by 40-49 years (22.00%) and 20-29 years (20.10%). Educationally, 43.90% hold a Bachelor's degree, 35.20% have a Master's degree, and 20.90% possess a Doctorate. Regarding length of service, the largest segment has 6-10 years of experience (30.20%), followed by 0-5 years (22.30%) and 11-15 years (18.30%). In terms of NPA dealing experience, 36.00% have no experience, while 33.50% have 1-5 years, 18.00% have 6-10 years, and 12.50% have over 11 years. This data provides a clear picture of the bankers' demographic composition.

Table 1: Demographic frame of Bankers

Category	Fre.	Percent
Gender		
Male	185	66.60
Female	093	33.40
Age Group		
20-29 years	56	20.10
30-39 years	83	29.90
40-49 years	61	22.00
50-59 years	49	17.60
60+ years	29	10.40
Education Level		
Bachelor's Degree	122	43.90
Master's Degree	98	35.20
Doctorate	58	20.90
Length of Service		
0-5 years	62	22.30
6-10 years	84	30.20
11-15 years	51	18.30
16-20 years	46	16.50
21+ years	35	12.70
NPA Dealing Experience		
No experience	100	36.00
1-5 years	93	33.50
6-10 years	50	18.00
11+ years	35	12.50

Table 2 presents the reliability analysis of various constructs, demonstrating their internal consistency and reliability. Bank Profitability (BPF) has a Cronbach's alpha of 0.750, an AVE of 0.643, and a CR of 0.385, indicating moderate reliability. Implementation Strategies (IPS) shows good reliability with a Cronbach's alpha of 0.811, an AVE

of 0.685, and a CR of 0.559. Borrower Profiles (BRP) exhibits strong reliability with a high Cronbach's alpha of 0.881, an AVE of 0.462, and a CR of 0.606. Program Effectiveness (PRE) achieves excellent reliability, reflected by the highest Cronbach's alpha of 0.900, an AVE of 0.454, and a CR of 0.601.



Table 2: Reliability Analysis

Constructs	Cron. alpha	AVE	CR
Bank Profitability (BPF)	0.750	0.643	0.385
Implementation Strategies (IPS)	0.811	0.685	0.559
Borrower Profiles (BRP)	0.881	0.46 2	0.606
Program Effectiveness (PRE)	0.900	0.454	0.601

Table 3 presents the Heterotrait-Monotrait Ratio (HTMT) analysis, which assesses the discriminant validity of the constructs. Bank Profitability (BPF) shows a high self-correlation (0.825) and strong correlations with Implementation Strategies (IPS) at 0.801. With a self-correlation of 0.784, IPS also correlates moderately with Borrower Profiles (BRP) at 0.522. BRP, which has a self-correlation of 0.487, correlates moderately with BPF

(0.756) and IPS (0.522), and shows a moderate correlation with Program Effectiveness (PRE) at 0.557. PRE, having a self-correlation of 0.688, exhibits moderate correlations with BPF (0.745) and IPS (0.415). These HTMT values, all below 0.90, indicate that the constructs possess adequate discriminant validity, confirming that each construct is distinct (Anurag Shukla, Manish Dadhich, Dipesh Vaya, 2024).

Table 3: HTMT Analysis

Constructs	BPF	IPS	BRP	PRE
Bank Profitability	0.825			
Implementation Strategies for NPA	0.801	0.784		
Borrower Profiles	0.756	0.522	0.487	
Program Effectiveness	0.745	0.415	0.557	0.688

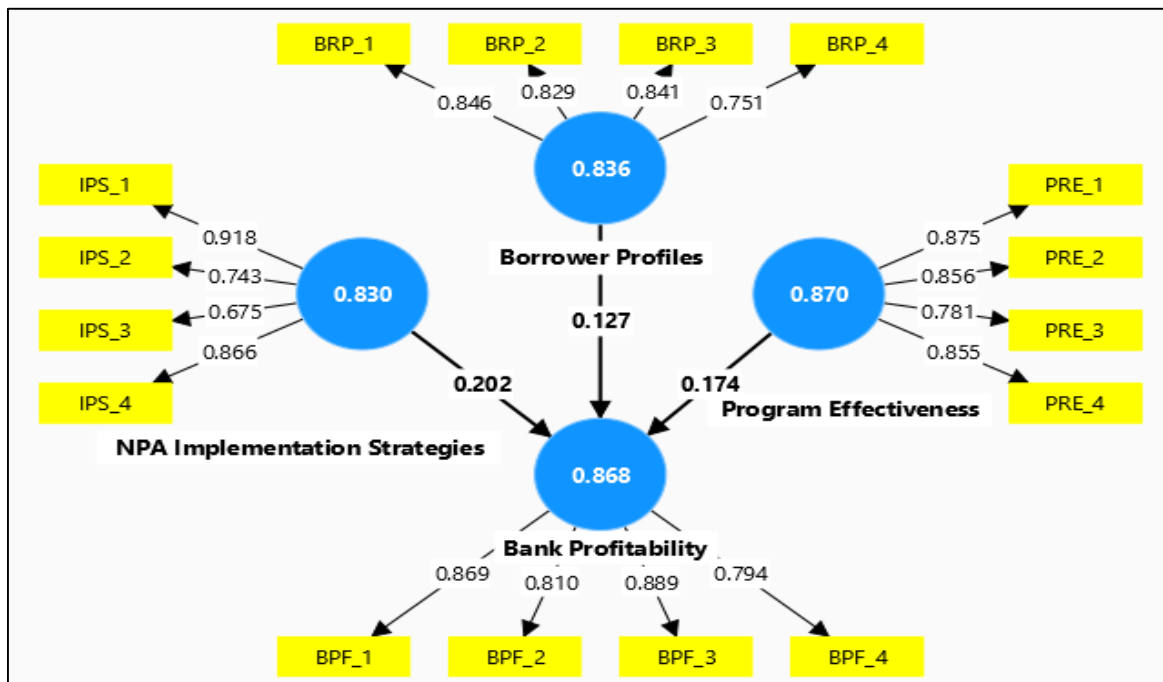


Fig. 1: SEM Model for Banks Profitability



H1: Implementation Strategies → Bank Profitability: The positive and significant relationship between implementation strategies and bank profitability (B.stat. = 0.810, T-st. = 7.021, $p < 0.001$) supports the hypothesis that effective implementation strategies enhance bank profitability. This finding is consistent with previous research by (Sonali Bhati; Manish Dadhich; Anand A Bhasker; Kamal Kant Hiran; Roshni Sharma; Anurag, 2023), who demonstrated that well-planned and executed strategies significantly impact financial performance.

H2: Borrower Profiles → Bank Profitability: The significant and positive effect of borrower profiles on bank profitability (B.stat. = 0.548, T-st. = 6.233, $p < 0.001$) suggests that understanding and managing borrower profiles effectively contributes to higher profitability. This result aligns with the studies conducted by Brown (2019) and (Dadhich et al., 2024), which highlighted the importance of detailed borrower profiling in reducing credit risk and enhancing bank performance.

Table 4: Assessment of Hypotheses

SN	Factors	B.stat.	X	Sigma	T-st.	Signi.
H ₁	Implementation Strategies → Bank Profitability	0.810	0.321	0.189	7.021	0.000
H ₂	Borrower Profiles → Bank Profitability	0.548	0.23	0.176	6.233	0.000
H ₃	Program Effectiveness → Bank Profitability	0.458	0.425	0.524	2.95	0.000

H3: Program Effectiveness → Bank Profitability: The significant relationship between program effectiveness and bank profitability (B.stat. = 0.458, T-st. = 2.950, $p < 0.001$) indicates that the effectiveness of banking programs is a crucial determinant of profitability. Previous research by (Gaurav Kumar Singh & Manish dadhich, 2023) corroborates this finding, emphasizing that effective banking programs improve customer satisfaction and financial outcomes.

additional factors influencing program effectiveness and impact, inspiring future research on related topics such as debt relief mechanisms and comparative analyses of programs globally. The study will contribute to academic literature by providing empirical evidence and insights into debt waiver programs, serving as a reference point for theoretical frameworks and methodological approaches in banking, finance, and development economics. The study has broader implications for policy reform, risk management, bank strategic planning, empowerment of borrowers, capacity building, collaboration, and global insights and knowledge exchange. It can drive positive change, fostering collaboration and empowering stakeholders to build more resilient and inclusive financial systems. The study's implications extend beyond India, offering valuable insights and recommendations for policy, practice, and further banking, finance, and economic development research.

V. Implication of the Study

For policymakers, the findings offer insights into the effectiveness and challenges of debt waiver programs, informing the formulation of more targeted policies to improve design and implementation. This can lead to enhanced regulatory interventions promoting transparency, accountability, and fairness, fostering financial inclusion and consumer protection. Banking institutions can leverage the study to optimize their debt waiver programs, enhancing profitability while delivering meaningful relief to borrowers. The insights gained from the study will highlight areas for improvement in implementation, such as streamlining processes and refining risk management strategies (Dadhich, Manish, Shalendra Singh Rao, Renu Sharma, 2023). Borrowers will benefit by gaining insights into debt waiver programs, understanding their rights and responsibilities, and making informed decisions on debt management and financial planning, ultimately improving their financial well-being. Researchers will be able to build upon the study to explore

VI. Limitations of the Study

Firstly, using convenience sampling methods may introduce sampling bias, potentially skewing the findings as participants may not be wholly representative of all banker officials involved in debt waiver programs across India. Consequently, the generalizability of the study's conclusions to the broader population of banking institutions in the country may be limited. Secondly, the reliance on self-reported data collected through structured questionnaires poses a risk of self-report bias. Respondents may be inclined to provide



socially desirable responses or inaccurately recall information, compromising the data's reliability and accuracy. Furthermore, the study's cross-sectional design restricts its capacity to establish causal relationships or capture temporal changes over time. Longitudinal studies would offer a more robust understanding of the dynamics of debt waiver programs, including their long-term effects on banks' profitability and other relevant outcomes. Moreover, the dependence on data collected via Google Forms may present challenges regarding data availability, particularly among segments with limited internet access or digital literacy skills. This could skew the sample's composition and undermine the study's representativeness.

VII. Future Scope of Research

There are several avenues for future research to expand upon the study's findings and address its limitations. Longitudinal analyses could offer insights into the sustained impact of debt waiver programs over time, while comparative studies across different countries or regions could shed light on variations in program effectiveness and design. Qualitative approaches, such as in-depth interviews or focus group discussions, could complement quantitative data by providing deeper insights into the experiences and perceptions of borrowers and banker officials involved in debt waiver programs. Additionally, future research could focus on conducting rigorous impact assessments to evaluate the broader socio-economic implications of debt waiver programs, employing advanced analytical techniques to enhance the depth and sophistication of analysis. Policy evaluation research could explore the implications of debt waiver programs on financial inclusion and economic development, while greater stakeholder engagement could ensure that research findings are relevant, actionable, and responsive to the needs of all involved parties.

VIII. Conclusion

This study underscores the significant interplay between implementation strategies, borrower profiles, and program effectiveness in influencing bank profitability within the context of agricultural debt waivers and Non-Performing Assets (NPA) in India. The analysis confirms that well-executed implementation strategies have a robust positive impact on profitability, suggesting that banks can enhance financial performance by adopting effective strategic practices. Additionally, the importance of borrower profiles is highlighted,

revealing that detailed and accurate borrower profiling significantly contributes to profitability by mitigating credit risk. Program effectiveness is also crucial, as effective banking programs are linked to improved financial outcomes. These insights collectively indicate that banks must focus on refining their strategies, profiling practices, and program implementations to manage NPAs better and improve profitability. Addressing these areas can help banks navigate the challenges associated with agricultural debt waivers and enhance overall financial stability in the Indian banking sector.

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