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Determinants of Financial Inclusion among Smallholder Farmers in Zimbabwe

[1*] Authur Masuka, [2] Tanyaradzwa Rukasha, [3] Simbarashe Tatsvarei

[1*] PhD student, Department of Agribusiness and Management, Marondera University of Agricultural Science and Technology, P.O. Box 35, Marondera, Zimbabwe

[2] Department of Agribusiness and Management, Marondera University of Agricultural Science and Technology, P.O. Box 35, Marondera, Zimbabwe

3 Department of Agricultural Business Development and Economics, University of Zimbabwe, P.O. Box MP167 Mt Pleasant, Harare, Zimbabwe

https://orcid.org/0009-0007-9488-8598

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Abstract

Purpose: Financial inclusion is critical for improving rural livelihoods, yet many farmers remain excluded due to various socioeconomic and systemic barriers. This study examines the factors influencing financial inclusion among smallholder farmers in Zimbabwe, focusing on access to formal financial services.

Methodology: The study employs a binary logistic regression model to analyze data collected from smallholder farmers, assessing the impact of financial literacy, education, age, gender, household size, and farm characteristics on financial participation. Results indicate that while 94.4% of farmers achieve basic financial inclusion, only 25.6% access multiple financial services.

Findings: Financial literacy emerges as the most significant determinant, with limited education, large household sizes, and gender disparities having a negative effect. Systemic barriers, including high transaction costs and inadequate rural banking infrastructure, further hinder inclusion. The study highlights the importance of targeted financial literacy programs, gender-sensitive financial products, and improved rural financial infrastructure.

Unique Contribution to Theory, Policy and Practice: Policy recommendations include expanding mobile banking services, reducing transaction costs, and fostering collaboration between financial institutions and policymakers. Future research should assess the long-term impact of financial literacy initiatives and effectiveness of digital financial services in enhancing inclusion. Strengthening financial access can improve the resilience of smallholder farmers, thereby contributing to sustainable agricultural development and economic growth in Zimbabwe.

Keywords: *Financial Access, Comprehensive Inclusion, Financial Inclusion, Smallholder Farmers, Zimbabwe Agriculture*

1. Introduction

Financial inclusion is widely acknowledged as a key driver of economic development, particularly in low- and middle-income countries. It encompasses three critical dimensions access, usage, and quality that collectively define the availability of affordable and appropriate financial products and services for individuals and enterprises of all sizes (World Bank, 2024). Access refers to both the presence and affordability of financial services, usage involves the consistent and meaningful engagement with these services, and quality ensures that financial offerings meet the diverse needs of users (Hasan, Dowla, & Tarannum, 2024). Together, these components contribute to financial stability and inclusive economic growth, particularly within the agricultural sector, where smallholder farmers represent a significant portion of the workforce in developing economies.

Smallholder agriculture plays a crucial role in food security and economic resilience in many developing nations. Enhancing financial inclusion in this sector can provide farmers with access to essential financial services, including credit, savings, transactions, insurance, and payment systems (Chikweche, Chaora, & Cross, 2023). These services enable farmers to manage their resources effectively, invest in productivity-enhancing activities, and mitigate risks associated with climate change and market fluctuations. Given its role in enhancing resilience and productivity, expanding financial access in the agricultural sector remains a priority.

The concept of financial inclusion gained global attention in 2006 when Muhammad Yunus, founder of Grameen Bank, received the Nobel Peace Prize for pioneering microfinance (Matsvai, 2024). Since then, financial inclusion has become a central focus of global development, aligning with the United Nations' Sustainable Development Goals (SDGs) and the G20's High-Level Principles for Digital Financial Inclusion (World Bank, 2024). These initiatives emphasize financial access as a catalyst for economic growth and poverty alleviation. Despite progress, financial disparities persist. The World Bank's Global Findex Report (2021) indicates that 76% of adults worldwide now have access to financial services, up from 51% in 2011. However, regional gaps remain sub-Saharan Africa's financial inclusion rate is 55%, while that for Zimbabwe stands at 50% (FinMark, 2022). Barriers, including a lack of collateral, high transaction costs, weak financial infrastructure, and limited literacy, hinder access to financial services for rural and agricultural communities (Matsvai, 2024).

In smallholder agriculture, financial exclusion is influenced by infrastructure gaps, limited access to agricultural credit, and systemic risks such as climate change and price volatility (Chimanga & Kawimbe, 2024). Gender disparities, low education, and financial illiteracy further restrict access (Matsvai, 2024). Overcoming these challenges requires targeted interventions, including enhanced financial education, expanded rural banking, and innovative financial solutions specifically designed for farmers.

This study examines financial inclusion among Zimbabwean smallholder farmers by assessing their access to essential services, including credit, savings, insurance, and payment systems. Farmers are classified into five levels of financial inclusion, which are full, comprehensive, partial, basic and complete exclusion. Findings will provide policymakers and development practitioners

with insights to design strategies that enhance agricultural sustainability and financial resilience. By identifying key barriers and drivers, the study aims to inform policies that enhance financial access and promote economic development in Zimbabwe's agricultural sector.

2. Overview of Financial Inclusion in Zimbabwe

Zimbabwe has made progress in financial inclusion, with the Reserve Bank of Zimbabwe (RBZ) reporting that, by 2022, 83% of adults were accessing financial services, while 12% remained excluded (RBZ, 2025). Mobile money has significantly improved access, especially in rural areas, yet only 46% of adults use traditional banking services (FinMark, 2022). Gender parity has improved, with equal exclusion rates for men and women (RBZ, 2025); however, smallholder farmers and rural populations continue to face significant barriers, including limited financial literacy, inadequate infrastructure, and restricted access to credit. Less than 40% of smallholder farmers utilize formal financial services, instead relying on informal savings groups and money lenders (World Bank, 2024). Zimbabwe's financial sector comprises formal institutions regulated by the RBZ, mobile financial services under the purview of the Postal and Telecommunications Regulatory Authority of Zimbabwe (POTRAZ), and informal mechanisms overseen by the Ministry of Women Affairs, Community, Small and Medium Enterprises Development (RBZ, 2025). Expanding financial inclusion requires coordinated efforts among regulators, financial providers, and policymakers to bridge existing gaps.

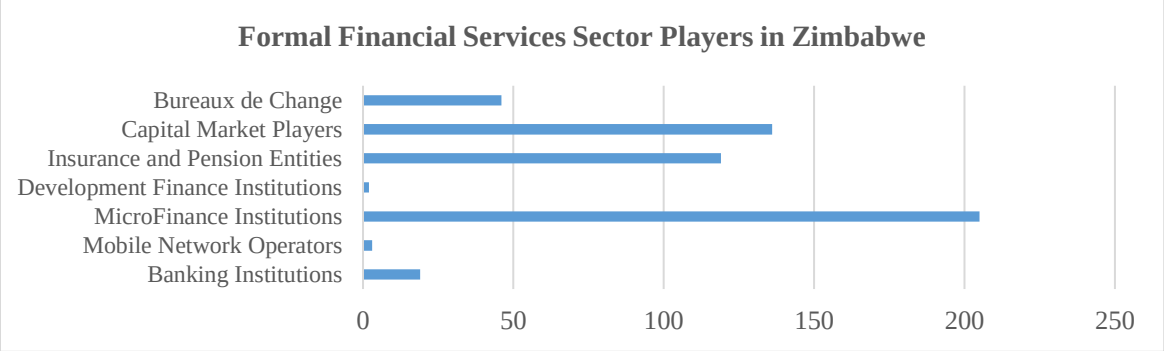

Figure 1: Zimbabwe's Financial Services Outlook (RBZ 2025)

3. Methodology

3.1 Data

The study was conducted in nine rural districts of Mashonaland East province in Zimbabwe. A systematic questionnaire was developed to collect quantitative data for the research. The Research Ethics Committee of the Agribusiness and Management Department at Marondera University of Agricultural Sciences and Technology (MUAST) approved the structured questionnaire used in this study (Approval Number: MUAST 03/24) in accordance with the MUAST Research Ethics Policy (2020). The primary data sources for this study were smallholder farming households. Data were collected from a sample of 445 households through face-to-face interviews using a structured questionnaire the first part of the questionnaire aimed to identify the socio-demographic

characteristics of the respondents' households. The second part included questions on several broad categories: agricultural status, financial services and products, financial literacy, and household income estimation. The sample unit consisted of household heads who were farmers, aged 18 or older, and engaged either in the official financial market or not. The sample size for the household survey was calculated using a derivative of Yamane's formula for calculating sample size when population size is finite (Sorzano, 2022). The strategy for sampling respondents involved random selection of villages within each ward, followed by systematic sampling. The study primarily relied on the Lot Quality Assurance Sampling (LQAS) technique (Kamau, Majiwa, Otieno, & Kabuage, 2024). Using the LQAS, 24 wards were selected to represent the various agro-ecological zones in the province for the study.

3.2 Methods of Analysis

This study employs quantitative methods, including descriptive analysis, inferential statistics, and binary logistic regression, to investigate the factors influencing smallholder farmers' access to financial services. The analysis models financial inclusion or exclusion based on four main variables: agricultural credit, savings accounts, insurance and mobile money wallets.

3.3 Model Specification

The binary logistic regression model is chosen due to the dichotomous nature of the dependent variable. Financial inclusion is assigned a value of 1 (included), and financial exclusion is assigned a value of 0 (excluded). This method assumes the dependent variable follows a Bernoulli distribution dependent on predictor variables (Fritz & Berger, 2015). Let P_j represent the probability that the j^{th} farmer is formally financially included, and assuming that P_j is a Bernoulli random variable and its distribution depends on the predictor vector X, then:

$$P_j(X) = \frac{e^{\alpha+\beta X}}{1+e^{\alpha+\beta X}} \quad (4.1)$$

The logit function to be estimated is then expressed as:

$$\ln\left(\frac{P_j}{1-P_j}\right) = \alpha + \sum I\beta_i X_{ij} \quad (4.2)$$

Where the logit variable $\ln\left(\frac{P_j}{1-P_j}\right)$ represents the natural logarithm of the odds favouring a farmer being formally financially included. The coefficient estimates of β indicate the change in the log-odds (the logarithm of relative probabilities) of the outcome, here equal to 1, for a one-unit increase in the independent variable, while holding all other independent variables constant. Logit regressions are calculated using Maximum Likelihood Estimation (MLE) instead of Ordinary Least Squares (OLS) (Vaibhav, 2023). MLE computes coefficient estimates that maximize the likelihood of the sample data set being observed.

The binary logistic regression model is specified as follows:

$$C_{ij} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k + \varepsilon_{ij} \quad (4.3)$$

Where,

- C_{ij} is the probability of financial inclusion (Dummy = 1 if a farmer is formally financially included, and 0 if financially excluded).
- β_0 is the intercept and β_1- β_{15} are the coefficients for the independent variables X_1 - X_{15}.
- X_1 - X_{15} are the independent variables (Age of the household head, Gender of the household head, Household head's level of education, Household head's employment status, Annual income, Smartphone ownership, Financial literacy, Access to financial services, Financial market proximity, ICT device ownership, Mobile network connectivity, Internet access, Attitude towards risk, Extension Contact, and Membership in farmer organization).
- ε_{ij} is the stochastic error term.

3.4 Definition of variables

The binary logistic model includes one dependent variable (financial inclusion) and multiple independent variables categorized as demographic, socio-economic, geographic, behavioral, and institutional factors. Financial inclusion is categorized as follows: *fully included* (4)- access to credit, savings, insurance, and mobile money; *comprehensively included* (3)- access to three of the four services; *partially included* (2)- access to two services; *basic inclusion* (1)- access to one service; and *excluded* (0)- no access to formal financial services.

4. Empirical Results and Discussion

This study examines the factors influencing financial inclusion among Zimbabwean smallholder farmers, with a particular focus on their access to formal financial services. Data from 445 farmers in Mashonaland East were analyzed using various statistical methods to identify key predictors of financial inclusion.

4.1 Descriptive Statistics

Table 1 displays the descriptive statistics for the independent variables utilized in this study.

Table 1: Summary statistics for the variables (n=445)

Variable Name	Observations	Mean	Std Deviation	Variance	Skewness	Kurtosis
Financial Inclusion	445	0.950562	0.217025	0.0471	-4.15684	18.27928
Age of the household head	441	45.38209	12.73353	162.1429	0.300476	2.745366
Highest education level	441	4.099773	2.443735	5.971841	0.36687	1.945309
Employment status	441	1.578231	1.030833	1.062616	0.337922	1.733848
Annual income	441	239.3197	414.9766	172205.6	3.448793	17.75139
Financial literacy	445	0.262921	0.811292	0.658194	-0.10808	2.181049
ICT device ownership	441	1.959184	0.198089	0.039239	-4.6414	22.54255
Distance to financial institution	441	41.44898	35.63282	1269.698	8.492423	129.4015
Membership of savings group	445	0.134832	0.341928	0.116915	2.138843	5.572511

Source: Author's estimation

Key demographic and socio-economic factors influencing financial inclusion include education, employment, ICT ownership, and income. Most farmers have basic financial access, but disparities persist. This aligns with the findings of (Hasan, Dowla, & Tarannum, 2024), who reported that mobile banking in rural areas significantly enhances financial inclusion. The average education level is 4.10, indicating that most farmers have an education level of up to secondary school. The positive skewness of 0.37 indicates that most smallholder farmers have primary or secondary education, while the low kurtosis of 1.94 suggests that there are few extreme variations in educational attainment. Informal employment (mean = 1.58) limits access to financial services, as institutions typically require proof of stable income (Osabutey & Jackson, 2024).

ICT device ownership is high (mean = 1.96), indicating near-universal mobile phone usage, presenting an opportunity for mobile banking expansion. However, participation in savings groups remains low (mean = 0.13), which limits the potential for financial inclusion. The average age of household heads is 45.38 years (SD = 12.73), indicating a slight positive skewness (0.30) that suggests a somewhat younger population distribution, with financial literacy generally increasing with age. Younger farmers struggle with access due to limited collateral. Income disparities are pronounced (mean = USD 239.32, SD = USD 414.98, skewness = 3.45), reflecting considerable income inequality, underscoring the need for subsidized credit programs for low-income farmers. The distance to financial institutions (mean = 41.45 km, SD = 1,269.70) highlights accessibility challenges, reinforcing the need for mobile banking. Studies by (Chikweche, Chaora, & Cross, 2023) and (Chandio, et al., 2021) corroborate the role of these variables in enhancing financial inclusion.

4.1.1 Financial services utilization

Table 2 below illustrates the distribution of financial services utilized by smallholder farmers.

Table 2: Distribution of usage of financial services (n=445)

Financial Service	Frequencies	Percentage
Savings	120	26.9
Agricultural credit	90	20.1
Agricultural insurance	60	13.4
Mobile money (Payment systems)	150	33.6
No services accessed	25	5.6

Source: Authors' compilation

Basic access to at least one financial service is high, at 94.4%, with mobile banking leading the adoption, a trend that mirrors those in Mozambique and Kenya (Tiwasing, Addae, Naab, & Naab, 2024). However, only 26.9% engage in formal savings, hindered by low income and distrust of banks (Dzingirai, Chikokol, & Pierre, 2024). Informal savings appear to be the dominant form due to economic, financial, and social considerations. Agricultural credit access is low (20.1%), primarily due to high collateral requirements and risk aversion. This finding is consistent with prior research by (Mushore & Makate, 2022), which identifies credit constraints as a significant obstacle to financial inclusion for smallholder farmers in sub-Saharan Africa. Even fewer farmers (13.4%) use agricultural insurance due to affordability and awareness issues. A small segment (5.6%) remains financially excluded due to economic hardships and distrust, aligning with a study by (Chimwai, 2022), which found that a significant portion of Zimbabwe's informal sector population remains financially excluded. Mobile banking and microfinance could bridge this gap.

4.1.2 Extent of financial inclusion among smallholder farmers

Assessing the depth of financial inclusion provides a clearer understanding of its impact. According to the World Bank (2025), it is not enough for individuals to access a single financial service; they must actively use various services to enhance their livelihoods. This study employs an adaptation of (Sarma, 2016)'s composite financial inclusion index (FI-Index) to categorize farmers into five levels: completely excluded, basic, partial, comprehensive, and full inclusion. Table 3 presents the distribution of basic financial inclusion and complete exclusion.

Table 3: Financial inclusion across demographics and socioeconomic variables

Category	Financially Included (Basic +) (%)	Financially Excluded (%)
Age (18-35)	45.2	54.8
Age (36-60)	55.8	44.2
Age (Above 60)	32.1	67.9
Gender (Male)	60.4	39.6
Gender (Female)	48.7	51.3
Education Level (Primary)	35.6	64.4
Education Level (Secondary)	50.2	49.8
Education Level (Tertiary)	68.4	31.6
Employment Status (Unemployed)	28.9	71.1
Employment Status (Self-employed)	55.1	44.9
Employment Status (Employed)	72.3	27.7
Income Level (Low)	30.5	69.5
Income Level (Medium)	55.7	44.3
Income Level (High)	75.9	24.1

Middle-aged farmers have the highest financial access, while young adults (18-35) and the elderly (60+) struggle due to low income and digital illiteracy (Khan, et al., 2021). Gender disparities

persist, with men experiencing greater financial inclusion due to systemic barriers, including land ownership and literacy gaps. Education has a strong influence on inclusion, increasing from 35.6% (primary) to 68.4% (tertiary). Employment status is also crucial, as unemployed farmers face 71.1% exclusion. Higher-income farmers (75.9%) enjoy greater financial access. These results are consistent with earlier studies conducted across Africa, particularly those by (Gan, Hernandez, & Liu, 2022) and (Ansar, Klapper, & Singer, 2023), which focused on assessments of rural financial inclusion.

The study adapts (Sarma, 2016) metrics to measure financial inclusion across categories: basic, partial, comprehensive, full, and completely excluded. The results are shown in Table 4.

Table 4: Financial inclusion by levels (n=445)

Financial Level	Frequency	Percentage
Completely excluded	25	5.62
Basic	150	33.71
Partial	156	35.06
Comprehensive	88	19.78
Full	26	5.84

Source: Authors' compilation

Overall, atleast basic inclusion is attained by 94.38% of farmers, while only 25.62% achieve meaningful financial inclusion (comprehensive and full), as defined by the G20's Basic Set of Financial Inclusion Indicators (GPFI, 2012). This pattern suggests that, although a notable proportion of smallholder farmers have some access to financial services, many still face obstacles to achieving full integration into the formal financial system. The FinScope Zimbabwe 2022 Consumer Survey supports these findings, reporting that formal financial inclusion increased from 38% in 2011 to 84% in 2022. However, only 27% of rural adults utilized formal financial services, highlighting a substantial reliance on informal financial practices, such as home savings and informal lending sources (FinMark, 2022). This highlights that, despite significant progress in financial inclusion, a large portion of the population, especially smallholder farmers, remains underserved or excluded from the formal financial system. Addressing these issues requires targeted interventions, such as enhancing rural financial infrastructure, reducing transaction costs, and expanding financial literacy programs.

4.2 Econometric Results

4.2.1 Goodness of Fit Measure

Table 5 below summarizes key metrics from the goodness-of-fit test. The logistic regression model's log-likelihood (-51.1589), LR chi-square (25.14, p < 0.0001), and pseudo-R-squared (0.1972) suggest a reasonable explanatory power. Model accuracy is high (94.75%), with strong sensitivity (99.68%) but poor specificity (0.00%), indicating limitations in classifying excluded cases. Addressing data imbalance through infrastructure analysis and inclusive policies could improve specificity.

Table 5: Metrics from the goodness of fit test

Classification confusion matrix and performance metrics				**Goodness-of-fit test**	
Classified	**- True -**		**Total**	**Statistic**	**Value**
	D	**~D**		Number of Observations	324
+	307	16	323	Number of Covariate Patterns	313
-	1	0	1	Pearson Chi-square (chi2(299))	239.90
Total	**308**	**16**	**324**	Prob > chi2	0.9982

Sensitivity	Pr (+| D)	99.68%
Specificity	Pr (-|~D)	0.00%
Positive Predictive Value	Pr (D| +)	95.05%
Negative Predictive Value	Pr (~D|-)	0.00%
False + rate for true ~D	Pr (+|~D)	100.00%
False - rate for true D	Pr (-| D)	0.32%
False + rate for classified +	Pr (~D|+)	4.95%
False - rate for classified -	Pr(D|-)	100.00%
Correctly classified	94.75%	

4.2.2 Determinants of financial inclusion

The regression model in Table 6 estimates the key determinants of financial inclusion. The likelihood ratio chi-square test (LR chi2(5) = 25.14, p < 0.0001) demonstrates that the overall model is statistically significant, indicating that at least one predictor has a significant effect on

financial inclusion. The variable "ICT device ownership" was omitted from the model, as the majority of the values were the same (1), indicating that most respondents owned mobile phones.

Table 6: Results of the logistic regression model on determinants of basic financial inclusion

Variable	Coefficient	Std. Error	z-value	P>|z|	95% Confidence Interval
Financial literacy	0.8794	0.198	4.44	0.000	[0.4913, 1.2676]
Age category	0.1882	0.1182	1.59	0.111	[-0.0436, 0.4199]
Financial market proximity (Km)	-0.0283	0.0071	-4.02	0.000	[-0.0422, -0.0145]
Highest education level attained	-0.1052	0.0596	-1.76	0.078	[-0.2221, 0.0117]
Household size	0.1078	0.0618	1.74	0.081	[-0.0133, 0.2290]
Farm size (Ha)	0.0058	0.0037	1.56	0.118	[-0.0015, 0.0130]
ICT device ownership	Omitted	-	-	-	-
Employment status	0.0549	0.1418	0.39	0.698	[-0.2230, 0.3328]
Mobile network connectivity	-0.2176	0.6193	-0.35	0.725	[-1.4315, 0.9963]
Membership of savings group	-0.9024	0.4277	-2.11	0.035	[-1.7407, -0.0641]
Constant (cons)	-0.6431	0.8916	-0.72	0.471	[-2.3905, 1.1044]

Number of observations-311; Log likelihood-158.94504; LR chi2 (9)-77.09; Pseudo R2-0.1952; Prob > chi2-0.0000

The results indicate that financial literacy has a significant positive impact on financial inclusion ($\beta = 1.6612$, $p < 0.01$), aligning with the findings of (Osabutey & Jackson, 2024) and (Matsvai, 2024), who highlighted the role of literacy in enhancing access to credit and owning bank accounts. Targeted financial literacy programs can significantly improve financial inclusion rates for smallholder farmers. Household size has a significant negative effect on financial inclusion ($\beta = -0.2959$, $p < 0.01$), consistent with the findings of (Mpeta, Mutambirwa, & Goredema, 2021) in Tanzania and (Chimanga & Kawimbe, 2024) in Malawi, where larger households tend to prioritize basic needs over financial services. These insights underscore the need for customized financial solutions tailored to the diverse demographics of farmers.

5 Conclusions and Recommendations

Financial inclusion among smallholder farmers in Zimbabwe remains a challenge despite some progress in accessing financial services. This study examines the factors influencing financial inclusion, revealing that while 94.4% of farmers achieve basic financial inclusion, only 25.6% attain meaningful financial inclusion (comprehensive and full), i.e., access to at least three financial services as defined by the G20's Basic Set of Financial Inclusion Indicators. Key predictors include financial literacy and household size, while education, age, and farm size have lesser impacts. Larger households negatively affect financial participation, and gender inequities restrict access, particularly for female-headed households. Systemic barriers, such as high transaction costs and inadequate infrastructure, further hinder inclusion.

To enhance financial inclusion for smallholder farmers, it is crucial to focus on financial literacy initiatives that cover credit terms, savings, and digital platforms. These initiatives should be tailored to meet the needs of farmers, including hands-on training for those with limited educational backgrounds. Financial institutions need to offer flexible repayment plans, lower collateral requirements, and gender-sensitive options for female farmers. Expanding mobile banking and digital services will enhance access to financial services in rural areas. These initiatives should align with key national strategies, such as the National Financial Inclusion Strategy II and the Agriculture and Food Systems Transformation Strategy. The Reserve Bank of Zimbabwe is encouraged to lead these efforts in collaboration with relevant ministries to promote economic development, reduce poverty, and enhance resilience.

In conclusion, future research on financial inclusion for smallholder farmers in Zimbabwe should evaluate the long-term effects of financial literacy programs on farmers' behaviors and resilience. Studies should also assess gender-sensitive financial products and the impact of digital financial services, especially in remote areas. Furthermore, examining policy interventions like reduced transaction costs and rural infrastructure development will provide valuable insights for enhancing financial inclusion strategies.

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