

Determinants of Savings and Investment Decisions among Semi-Medium and Medium Farmers in Western Maharashtra

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Abstract

The choices made by agricultural households in saving and investing are crucial for improving their economic resilience and financial security. But this decision is influenced by a mix of financial, socio-economic, demographic and risk factors. This study investigates the factors affecting savings and investment among semi-medium and medium farmers, Western Maharashtra. A structured interview schedule was used to conduct an exploratory study amongst 50 farmers, comprising 33 semi-medium farmers with 17 being medium farmers. The study included motives of savings, financial constraint, socio-economic constraint and the effect of demographic and socio-economic factors on the savings and investment result. Descriptive statistics, normality tests, Friedman tests and Bonferroni-adjusted pairwise comparisons, Mann–Whitney U tests, Kruskal–Wallis H tests, and Spearman's rank-order correlation were used to analyse the data. The results show that health and medical emergencies, risk factors and safety and security were the most significant factors affecting savings and investment decisions ($M = 4.06, 4.04$ and 4.00 respectively). There are significant differences between the factors influencing the savings and investment decisions ($\chi^2(8) = 48.898, p < 0.001$) and investment preferences ($\chi^2(6) = 52.136, p < 0.001$). There was no significant difference between farmers in semi-medium and medium category in terms of financial constraints and socio-economic constraints. Likewise, there were no significant demographic and socio-economic factors associated with the key savings and investment results. The study underscores the role of financial security, risk factors, household requirements, and financial awareness in comprehending the farmers' financial behaviour and offers valuable lessons for enhancing the financial capability of the rural population and financial planning for farmers.

Keywords: Savings Behaviour; Investment Decisions; Semi-Medium Farmers; Medium Farmers; Financial Decision-Making; Financial Literacy; Socio-Economic Constraints; Investment Preferences; Rural Finance; Western Maharashtra

1. Introduction

Savings and investment choices are essential to farmers' financial behaviour, and can affect household security, productive capacity and future economic resilience. The study deals with these decisions of semi-medium and medium farmers in Western Maharashtra in relation to their motivational factors, socio-economic and financial factors restricting their decisions and demographic influences. This study is aimed at determining the principle factors influencing the financial decision making of farmers.

1.1 Background and Context

Agriculture in rural India continues to be a primary source of livelihood and economic activity as agriculture households rely on agriculture income not only for the current consumption but also to save and make some productive investments. For farmers savings are used for a variety of purposes such as covering the costs of future spending, smoothing out the peaks and valleys of agricultural income, dealing with contingencies, and financing planned investments. The investment decisions, on the other hand, are strongly linked with farm expansion, purchase of agricultural equipment, irrigation facilities, animal stock, land improvement, and technology use and other productive activities. Therefore, saving and investment are significant aspects of the financial activities and economic coping mechanisms of agricultural households.

However, farmers' decisions to save and invest are not determined exclusively by the level of agricultural income. They are influenced by a combination of economic, demographic, financial and institutional factors. Household size, age, education, landholding, income, expenditure, occupation, access to financial services and financial knowledge can have a significant impact on the ability and willingness of farmers to invest the resources available. Moreover, the agricultural household environment is also one of production uncertainty, price volatility, climatic risks, and income irregularities, which may also impact financial choices.

Previous empirical research has shown that it is important to understand rural saving behaviour. In a rural sample-based study, Khanal et al. (2019) showed the applicability of consumption behaviour, habit formation and the economic situation of the households to save behaviour. Likewise, Mohd. and Verma (2018) analysed the saving and investment behaviour of rural households and emphasized that household characteristics and economic situations significantly influence the financial preferences of the rural households. The studies suggest that savings is a part of the overall allocation of household resources and cannot be studied separately.

1.2 Savings and Investment Behaviour among Agricultural Households

Income and expenditure relationship of agricultural households has significant impact on the financial position of agricultural households. Hamsa and Umesh (2020) analysed the income and expenditure of the farm households and found that the economic status of the household plays a significant role in the financial capacity of the households. Households that find their incomes in agriculture too low or too volatile may not be able to save much in cash or make large investments. Households with relatively stable or diversified income sources on the other hand could be more flexible in their allocation of resources to savings and productive investment.

Income diversification is therefore a key factor to consider in the context of farmers' economic choices. Mohapatra and Giri (2019) showed that the non-farm enterprises can impact the income and consumption expenditure of rural farm households, implying that alternative source of income can impact on the overall economic position of the agricultural households. More specifically, Zeeshan et al. (2022) examined the relationship between non-farm income and farm investment in rural India and highlighted the importance of alternative income sources in supporting agricultural investment. This suggests that farmers' investment capacity may depend not only on agricultural earnings but also on the extent to which households are able to diversify their income.

The interrelationship between income, savings and investment is particularly relevant to the present study. Bathla et al. (2022) examined the nexus between income, saving and investment among agricultural households and demonstrated the importance of analysing these financial decisions together. Savings can provide an internal source of finance for investment, while investment may contribute to future income generation and household financial security. Strzelecka and Zawadzka (2023) similarly examined the determinants of savings accumulation among agricultural households and established the importance of household and farm-level characteristics in determining the ability to accumulate savings.

Recent evidence further reinforces the importance of examining farmer-specific saving behaviour. Ghidode and Joshi (2024), in their study of small-farmer households in Chhattisgarh, examined saving behaviour in relation to farmers' socio-economic circumstances and saving objectives. Das and Maji (2023) also provided direct evidence that financial literacy, financial confidence and household characteristics influence the savings behaviour of Indian farmers. These findings indicate that farmers' financial decisions are shaped by both economic capacity and individual or household-level characteristics.

1.3 Financial Literacy, Financial Inclusion and Decision-Making

Financial literacy is increasingly recognised as an important determinant of household financial behaviour. Farmers are required to make decisions concerning bank deposits, credit, insurance, investments and other financial instruments, yet the ability to evaluate these alternatives depends partly on financial knowledge and confidence. Jayanthi and Rau (2019) examined the determinants of financial literacy among rural households in South India and demonstrated the relevance of socio-economic characteristics to financial knowledge. Raza and Lazar (2018) similarly examined financial literacy among rural households and highlighted the role of socio-economic conditions in shaping financial capability.

The relationship between financial literacy and financial decision-making has also been established in the Indian context. Banerjee and Roy (2020) examined financial literacy from an intra-household perspective and demonstrated its relevance to household financial decision-making. Biswas and Gupta (2021) further established that financial literacy influences household decision-making, particularly with respect to savings and investment. These findings suggest that farmers possessing greater financial knowledge may be better positioned to evaluate financial alternatives, manage resources and make informed saving and investment decisions.

Farmer-specific evidence provides further support for this relationship. Maji and Laha (2023) examined the antecedents of financial literacy among Indian farmers and highlighted the importance of demographic, agricultural and financial characteristics. Das and Maji (2023) extended this literature by examining financial literacy and financial confidence in relation to farmers' saving behaviour. Thus, financial knowledge and confidence can be considered important dimensions of farmers' financial decision-making capacity.

Financial inclusion represents another relevant dimension. Formal financial services can offer farmers better opportunities for saving in a secure way, access to productive credit and also financial products for investments. Vaid et al. (2020) looked into the factors behind financial inclusion for low-income rural households and discussed the significance of formal financial services. Similarly, Newar and Bhuyan (2022) highlighted financial education to the agricultural entrepreneurs through banks. Access to adequate

financial services, knowledge gaps, and inadequate institutional support, then, can limit the saving and investment capacities of farmers.

1.4 Financial and Socio-Economic Constraints

Agricultural households face several risks and constraints that can influence financial decisions. Agricultural income is often exposed to climatic uncertainty, production shocks, price fluctuations and changing market conditions. Such risks can reduce disposable income and increase the precautionary demand for savings. Newman and Tarp (2020) demonstrated that shocks can influence agricultural investment decisions, indicating that uncertainty may affect farmers' willingness and ability to undertake productive investments.

Farm characteristics can also affect investment decisions. Akber et al. (2024) examined land ownership security, farm investment and investment risk in Indian agriculture and demonstrated the importance of farm-level and institutional conditions in shaping investment decisions. Landholding characteristics, access to resources, investment risk and financial conditions can therefore influence whether farmers undertake long-term productive investments. Likewise, in their discussion on marketing decisions of farming households, Cariappa and Sinha (2020) offer supporting evidence that economic and market conditions affect the overall economic status of the farming household.

The results presented here indicate that financial constraints, socio-economic conditions and institutional access and agricultural risks all influence farmers' financial decisions. For semi-medium and medium farmers, the constraints can be of particular importance as their resource base and investment needs may vary from those of marginal and small farmers.

1.5 Demographic and Socio-Economic Determinants

Another element of farmers' financial behaviour is demographic and socio-economic features. Financial risk tolerance and investment preferences may vary with age, and financial awareness and the capacity to evaluate financial alternatives may be better as a result of education. The size of households may affect their consumption needs and the amount of disposable income that can be saved. Likewise, landholding, income, and occupation and access to non-farm income can impact the ability to save and invest. Jayanthi and Rau (2019) pointed out that socio-economic features are crucial for the financial literacy of rural households and noted that financial capability differences and differences in financial decision-making among rural households may stem from differences in their socio-economic characteristics.

The influence of these characteristics is also evident among farmers. Maji and Laha (2023) established that the variations in financial literacy of Indian farmers can be influenced by their demographic and agricultural characteristics, and Das and Maji (2023) found that the financial characteristics of the farmer's household and the individual are relevant to the saving behaviour of farmers. In a similar vein, Strzelecka and Zawadzka (2023) highlighted the significance of household/farm's characteristics in accounting for the variations in savings accumulation of agricultural households. The results of this study suggest that the savings and investment behavior of farmers are influenced by the combination of the individual and the economic factors related to the household and farm. Hence, along with the financial and institutional aspects, a demographic and socio-economic analysis would give a comprehensive understanding of the factors that determine farmers' savings and investment.

1.6 Financial Access, Savings Capacity and Productive Investment

Financial access may impact the capacity of farmers to save, meet financial needs and make productive investments. Households have mechanisms to deal with their income and allocate resources for future needs and agricultural activities through access to savings facilities, credit, insurance and formal financial services.

Empirical evidence shows the importance of financial access in agricultural households. Peprah et al. (2021) reported that based on nationally representative data of the Ghana Living Standard Survey, financial inclusion had a significant positive effect on the productivity of smallholder-farmers, and that credit, savings accounts and insurance all had varying impacts on productivity. They believe that financial services must go beyond credit and be able to cater to the farmers' wider financial needs.

The facility of savings is also illustrated by Batista and Vicente (2020), who ran a RCTs in smallholder farmers in rural Mozambique. Mobile savings that were accessible for remuneration or paid for led to savings of 34–36 percentage points and increased the likelihood of investing in fertiliser by 34 to 36 percentage points. The intervention, however, did not lead to the same effect on other factors of production, highlighting the effect of product design and purpose on farmer savings allocation.

Household economic conditions are also strongly related to financial capacity. As per Shafi et al. (2022) 90 farm households in District Kohat, Pakistan, found that savings was heavily influenced by income of the household, consumption expenditure and land size. The results indicate that in addition to access to financial services, saving capacity is also related to the number of resources and the saving commitments undertaken by the household.

Likewise, Bhat et al. (2024) analysed the saving patterns among rural households and identified household, socio-economic and institutional factors as the determinants of saving behaviour, showing that income is not the sole determinant. The results support the view that access to finance is an important factor in understanding rural saving behaviour, in addition to household and institutional factors.

In general, the evidence suggests that the access to finance and income capacity, combined with the need for expenditure, and the availability of suitable financial products influence farmers' savings and investment behaviours. Therefore, motivational and socioeconomic factors can be examined together with these dimensions to get a holistic view of savings and investment behaviours of semi-medium and medium farmers.

1.7 Research Gap and Present Study

While there has been significant research on rural savings, financial literacy, financial inclusion and financial behaviour of the households, there are some gaps. The literature mainly focuses on savings or investment separately and only a small number of studies focus on both the two decisions together in the financial behaviour of agricultural households. Moreover, a number of studies have addressed the agricultural households in general, small farmers or agricultural households without specification based on the category of landholders. Thus, further research is needed to understand what factors are responsible for saving and investing actions of semi-medium and medium farmers.

Another gap is in terms of geographical specificity. The available evidence from Indian studies from various states and rural areas is available, but little empirical evidence of semi-medium and medium farmers in Western Maharashtra is available. Farmers' economic conditions, access to agricultural inputs, income trends, and institutional access and exposure to agricultural risks can be significantly different between regions. Hence the results of other geographical areas should not be directly extended to Western Maharashtra.

In this background the present study attempts to explain the factors influencing the savings and investment behaviour of semi-medium and medium farmers of Western Maharashtra. The study identifies the factors that motivate farmers' saving and investment decisions, explores the predominant financial and socio-economic constraints on farmers' financial capacities and examines the impact of demographic and socio-economic characteristics upon their financial decision making. The study aims to offer a holistic perspective on the financial behaviour of the semi-medium and medium farmers, and to create evidence that can inform better financial planning, financial services for the rural population and agricultural policy.

1.8 Objectives and Hypotheses of the Study

Objectives

The following objectives are used to guide the study to look at the factors, constraints and socio-economic characteristics affecting the savings and investment decisions of semi-medium and medium farmers.

- To identify the key factors influencing savings and investment decisions among semi-medium and medium farmers.
- To examine the major financial and socio-economic constraints affecting farmers' savings and investment decisions.
- To analyse the influence of demographic and socio-economic characteristics on farmers' savings and investment decisions.

Hypotheses

Based on the above objectives, the following hypotheses are formulated to test the significant effect of these factors, constraints and characteristics on saving and investment decisions of semi-medium and medium farmers in an empirical way.

- **H₁₁:** The identified factors significantly influence the savings and investment decisions of semi-medium and medium farmers.
- **H₁₂:** Financial and socio-economic constraints significantly affect the savings and investment decisions of semi-medium and medium farmers.
- **H₁₃:** Demographic and socio-economic characteristics significantly influence the savings and investment decisions of semi-medium and medium farmers.

2. Methodology

2.1 Study Area, Sample, and Sampling Design

The study was carried out with farm households in western Maharashtra, a part of the state where irrigation and rain-fed farming systems are mixed and the financial structure in the villages is also fairly good. The respondents were divided into various categories based on the land holding classification of the Agriculture Census of India to which they belong and within that the semi-medium (2-4 hectares) and

medium (4-10 hectares) were targeted. This study adopted purposive random sampling to get a sample of 33 semi-medium and 17 medium farmers who had been selected, considering the nature of exploration.

2.2 Data Collection and Measures

Primary data were collected through a structured interview schedule covering (i) demographic and socio-economic profile (gender, age, education, occupation, and income); (ii) sixteen motivational factors underlying savings and investment decisions, rated on a five-point Likert scale; (iii) six financial and socio-economic constraints, rated on a four-point scale; and (iv) eight composite behavioural indices — Investment in Financial Assets, Investment in Physical Assets, Savings Pattern Index, Awareness, Satisfaction, Return Perception, Risk Perception, and Preference — each computed as the mean of its constituent Likert items.

2.3 Statistical Analysis

Data were analysed in SPSS. Descriptive statistics (mean, SD, median, range, skewness, and kurtosis) summarised the study variables, and the Kolmogorov–Smirnov and Shapiro–Wilk tests assessed normality. As most variables departed significantly from normality ($p < 0.05$), non-parametric tests were used for inferential analysis: the Friedman test with Bonferroni-adjusted pairwise comparisons to rank and compare motivational and preference factors (Objective 1); the Friedman and Mann–Whitney U tests to compare constraints across farmer categories (Objective 2); and Mann–Whitney U, Kruskal–Wallis H, and Spearman's rank correlation to test associations between demographic/socio-economic characteristics and savings–investment outcomes (Objective 3). Significance was set at $p < 0.05$.

3. Data analysis

The collected data were analysed to address the three objectives of the study. The analysis first describes the major savings and investment-related variables and assesses their distributional characteristics. Subsequently, non-parametric tests were employed to identify the factors influencing financial decisions, examine differences in financial and socio-economic constraints between farmer categories, and assess the relationship between demographic and socio-economic characteristics and savings–investment outcomes.

3.1 Descriptive Statistics of Major Study Variables

Table 3.1: Descriptive statistics of savings and investment-related variables (N = 50)

Variable	Mean	SD	Median	Minimum	Maximum	Range	Skewness	Kurtosis
Investment in Financial Assets	1.988	0.317	1.95	1.5	2.7	1.2	0.331	-0.805
Investment in Physical Assets	2	0.352	2	1.25	3.25	2	0.701	2.339

Savings Pattern Index	2.505	0.45	2.5	1.5	3.25	1.75	0.078	-0.719
Awareness Score	3.154	0.319	3.06	2.63	4.06	1.43	0.725	0.436
Satisfaction Score	3.433	0.483	3.5	2.17	4.17	2	-0.764	-0.124
Return Perception Score	2.673	0.318	2.69	2	3.44	1.44	-0.083	-0.474
Risk Perception Score	2.597	0.297	2.6	2	3.31	1.31	0.16	-0.322
Preference Score	2.92	0.89	2.75	1.13	4.69	3.56	0.468	0.043

The descriptive statistics show that the Satisfaction Score (Mean = 3.433) was the highest of all the composite scores followed by Awareness Score (Mean = 3.154). The lowest mean was given in the Investment in Financial Assets (Mean = 1.988). All variables have low skewness and kurtosis values within the acceptable range of approximately ± 2 , indicating that there were no significant deviations from normality with the exception of Preference Score, which had relatively high variability (SD = 0.890).

2. Normality Testing

Table 3.2: Tests of normality for major study variables (N = 50)

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Investment in Financial Assests	0.144	50	0.012	0.954	50	0.050
Investment in Physical Assests	0.135	50	0.022	0.947	50	0.027
Savings Pattern Index	0.154	50	0.004	0.948	50	0.028
Awareness Score	0.176	50	0.000	0.952	50	0.042
Satisfaction Score	0.175	50	0.001	0.930	50	0.006
Return Perception Score	0.106	50	.200*	0.980	50	0.538
Risk Perception Score	0.079	50	.200*	0.985	50	0.781

Preference Score	0.131	50	0.032	0.934	50	0.008
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The Shapiro–Wilk test showed that Investment in Financial Assets ($p = 0.050$) was close to normality, while all other scores, such as Investment in Physical Assets ($p = 0.027$), Savings Pattern Index ($p = 0.028$), Awareness Score ($p = 0.042$), Satisfaction Score ($p = 0.006$) and Preference Score ($p = 0.008$) significantly deviated from normality ($p < 0.05$) and only Return Perception Score ($p = 0.538$) and Risk Perception Score ($p = 0.781$) followed a normal distribution ($p > 0.05$). Hence, it is more suitable to use non-parametric statistical methods when working with variables that do not meet the normality assumption.

3.3 Factors Influencing Savings and Investment Decisions

H₁₁: The identified factors significantly influence the savings and investment decisions of semi-medium and medium farmers.

Table 3.3: Factors influencing savings and investment decisions among farmers (N = 50)

Factor	N	Minimum	Maximum	Mean	SD	Rank
Savings Decisions						
Education Expenses of Children	50	1	5	3.80	1.178	5
Health and Medical Emergencies	50	1	5	4.06	1.132	1
Contingencies	50	1	5	3.90	0.909	4
Purchase of Assets	50	1	5	3.34	1.423	10
Growth and Expansion	50	1	5	3.16	1.299	12
Retirement Planning	50	1	5	2.90	1.389	14
Tax Benefits	50	1	5	2.80	1.355	15
Risk of Inflation	50	1	5	3.24	1.302	11
Marriage Expenses of Children	50	1	5	3.76	1.135	6
Investment Decisions						
Safety and Security	50	1	5	4.00	1.143	3
Liquidity	50	1	5	3.46	1.297	9
Profitability	50	1	5	3.62	1.244	7
Tax Benefits	50	1	5	2.40	1.400	16
Risk Factors	50	2	5	4.04	0.925	2
Financial Advisor	50	1	5	2.96	1.177	13
Peer Experience	50	1	5	3.56	1.181	8

The results show that the most important factor influencing savings and investment decision was health and medical emergency ($M = 4.06$, $SD = 1.132$). This was followed closely by risk factors ($M = 4.04$, $SD = 0.925$) and safety and security ($M = 4.00$, $SD = 1.143$). Marriage expenses of children and education expenses of children also were rated relatively highly. Tax benefits on the investment-selection criteria was rated the lowest (Mean = 2.40, $SD = 1.400$), and retirement planning and financial advice were rated at a comparatively lower level as well. Overall, the results indicate that financial security, risk assessment, and needs of farmers' houses at the present time or in the future were more strongly correlated with decisions made than the tax-related benefits or formal financial advice.

Table 3.4: Friedman Test for Factors Influencing Savings Decisions

Statistic	Result
N	50
Friedman χ^2 (df = 8)	48.898
p-value	<0.001
Decision	Significant

Table 3.5: Bonferroni-Adjusted Pairwise Comparisons of Savings Factors

Comparison	Adjusted p
Tax Benefits – Marriage expenses	0.022
Tax Benefits – Contingencies	0.005
Tax Benefits – Education expenses	0.003
Tax Benefits – Health & Medical Emergencies	<0.001
Retirement Planning – Contingencies	0.019
Retirement Planning – Education expenses	0.011
Retirement Planning – Health & Medical Emergencies	0.001
Growth & Expansion – Health & Medical Emergencies	0.042

The Friedman test showed a **significant difference among the nine factors influencing savings and investment decisions**, $\chi^2(8) = 48.898$, $p < 0.001$. Health and Medical Emergencies received the highest mean rating ($M = 4.06$), followed by Contingencies ($M = 3.90$) and Education Expenses ($M = 3.80$), while Tax Benefits had the lowest rating ($M = 2.80$). Bonferroni-adjusted comparisons confirmed significant differences for the factor pairs shown above, indicating that **family needs, emergencies and contingencies were more prominent influences than tax benefits and retirement planning**.

3.4 Factors Influencing Investment Preferences

Table 3.6: Friedman Test for Factors Influencing Investment Preferences

Statistic	Result
N	50
Friedman χ^2 (df = 6)	52.136
p-value	<0.001
Decision	Significant

Table 3.7: Bonferroni-Adjusted Pairwise Comparisons of Investment Preference Factors

Significant Pairwise Difference	Adjusted p-value
Tax Benefits vs. Liquidity	0.012
Tax Benefits vs. Peer Experience	0.008
Tax Benefits vs. Profitability	0.001
Tax Benefits vs. Safety & Security	<0.001
Tax Benefits vs. Risk Factors	<0.001
Financial Advisor vs. Safety & Security	0.003
Financial Advisor vs. Risk Factors	0.002

The Friedman test showed a statistically significant difference among the seven investment preference factors, $\chi^2(6) = 52.136$, $p < 0.001$. Thus, the null hypothesis that all factors have the same distribution was rejected. After Bonferroni adjustment, significant differences were observed mainly between Tax Benefits and Liquidity, Peer Experience, Profitability, Safety & Security, and Risk Factors, as well as between Financial Advisor and Safety & Security and Risk Factors. The remaining pairwise comparisons were not statistically significant.

3.5 Financial and Socio-Economic Constraints

H₁₂: Financial and socio-economic constraints significantly affect the savings and investment decisions of semi-medium and medium farmers.

Table 3.8: Descriptive Statistics of Financial and Socio-Economic Constraints Affecting Farmers' Savings and Investment Decisions

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Insufficient income/financial resources	50	1	4	2.72	1.089
High family/social expenses	50	1	4	2.68	1.151
Lack of financial literacy	50	1	4	2.50	1.055
Lack of convenient savings instruments	50	1	4	2.40	0.990
Repayment of loan	50	1	4	2.84	0.912
Expenses related to health and education	50	1	4	2.86	1.125
Valid N (listwise)	50				

Table 3.9: Friedman Test for Financial and Socio-Economic Constraints Affecting Savings

Statistic	Result
N	50
Friedman χ^2 (df = 5)	9.072
p-value	0.106
Decision	Not Significant

Table 3.10: Comparison of Financial and Socio-Economic Constraints between Semi-Medium and Medium Farmers

Constraint	Semi-medium Farmers Mean Rank (n = 33)	Medium Farmers Mean Rank (n = 17)	Mann–Whitney U	Z	p-value
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Insufficient income/financial resources	27.06	22.47	229.000	-1.094	0.274
High family/social expenses	27.89	20.85	201.500	-1.680	0.093
Lack of financial literacy	26.05	24.44	262.500	-0.385	0.700
Lack of convenient savings instruments	27.47	21.68	215.500	-1.388	0.165
Repayment of loan	24.58	27.29	250.000	-0.666	0.506
Expenses related to health and education	22.97	30.41	197.000	-1.792	0.073

The Mann–Whitney U results show that the six constraints tested did not differ significantly between the semi-medium and medium farmers at the 5% level of significance. The semi-medium farmers (27.06) had a higher mean rank than the medium farmers (22.47) with respect to insufficient income/financial resources but this was not statistically significant ($U = 229.000$, $p = 0.274$). Similarly, higher mean ranks for semi-medium farmers and no statistical significance was found for family/social expenses or lack of convenient saving instruments.

The cost of health and education had the highest mean rank (30.41) among medium farmers, in comparison with semi-medium farmers (22.97), but the difference was not also statistically significant ($U = 197.000$, $p = 0.073$). Overall, the results indicate that the constraints faced by the two types of farmers were fairly similar, with some variations in the relative importance of specific constraints.

3.6 Influence of Demographic and Socio-Economic Characteristics

H₁₃: Demographic and socio-economic characteristics significantly influence the savings and investment decisions of semi-medium and medium farmers.

Table 3.11: Influence of Demographic and Socio-Economic Characteristics on Savings and Investment Outcomes

Factor	Variable Tested	Test Used	Statistic (U/H)	p-value	Significance
Gender	Financial Assets	Mann-Whitney U = 95	0.267	No	Males higher mean rank (26.34 vs 19.33)
	Physical Assets	Mann-Whitney U = 99.5	0.327	No	Males higher mean rank (26.24 vs 20.08)
	Savings Pattern	Mann-Whitney U = 85.5	0.159	No	Males higher mean rank (26.56 vs 17.75)

Age	Financial Assets	Kruskal-Wallis H = 1.657	0.799	No	41–50 yrs highest mean rank (27.63)
	Physical Assets	Kruskal-Wallis H = 1.401	0.844	No	30–40 yrs highest mean rank (27.50)
	Savings Pattern	Kruskal-Wallis H = 5.836	0.212	No	30–40 yrs highest mean rank (30.54)
Education	Financial Assets	Kruskal-Wallis H = 1.858	0.868	No	Post-graduates highest mean rank (32.33)
	Physical Assets	Kruskal-Wallis H = 1.227	0.942	No	Higher secondary/diploma highest mean rank (28.00)
	Savings Pattern	Kruskal-Wallis H = 3.068	0.689	No	Primary level highest mean rank (35.75)
Occupation	Financial Assets	Kruskal-Wallis H = 4.013	0.404	No	Professionals highest mean rank (42.00)
	Physical Assets	Kruskal-Wallis H = 1.342	0.854	No	Private employees highest mean rank (32.50)
	Savings Pattern	Kruskal-Wallis H = 1.325	0.857	No	Private employees highest mean rank (31.50)
Income	Financial Assets	Kruskal-Wallis H = 1.141	0.767	No	₹4–6 lakh group highest mean rank (30.19)
	Physical Assets	Kruskal-Wallis H = 1.778	0.620	No	Below ₹2 lakh group highest mean rank (29.53)
	Savings Pattern	Kruskal-Wallis H = 1.051	0.789	No	Below ₹2 lakh group highest mean rank (27.03)

3.7 Correlation Analysis

Table 3.12: Spearman's Rank-Order Correlations between Demographic/Socio-Economic Characteristics and Savings and Investment Outcomes

Predictor	Savings Pattern Index (p)	p	Financial Asset Investment (p)	p	Physical Asset Investment (p)	p
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Gender	0.201	0.122	0.159	0.271	0.140	0.333
Age	-0.207	0.158	-0.064	0.658	0.010	0.942
Education	0.027	0.624	0.067	0.641	0.098	0.500
Occupation	-0.041	0.934	-0.169	0.241	-0.067	0.645
Income	-0.105	0.493	0.096	0.507	-0.137	0.344

The Spearman correlation analysis showed no statistically significant association between gender, age, education, occupation, income, and the savings and investment outcomes ($p > 0.05$). Gender had a weak positive association with the Pattern Index ($\rho = 0.201$, $p = 0.122$), while age showed a weak negative association ($\rho = -0.207$, $p = 0.158$).

Education and income also showed weak and non-significant associations with savings and investment outcomes.

Overall, the findings provide no significant evidence that the examined demographic and socio-economic characteristics influence savings and investment behaviour.

4. Results

4.1 Profile of Study Variables

Farmers' Satisfaction ($M = 3.43$, $SD = 0.48$) and Awareness scores ($M = 3.15$, $SD = 0.32$) were markedly higher than their actual Investment in Financial Assets ($M = 1.99$, $SD = 0.32$) and Investment in Physical Assets ($M = 2.00$, $SD = 0.35$), pointing to a gap between favourable attitudes and realised investment behaviour (**Table 3.1**). The Shapiro–Wilk test confirmed non-normal distributions for most variables ($p < 0.05$), except Return Perception ($p = 0.538$) and Risk Perception ($p = 0.781$), supporting the use of non-parametric tests thereafter (**Table 3.2**).

4.2 Factors Influencing Savings and Investment Decisions

Health and medical emergencies ($M = 4.06$), risk factors ($M = 4.04$), and safety and security ($M = 4.00$) were rated the most important motivators, while tax benefits ($M = 2.40$ – 2.80) and retirement planning ($M = 2.90$) were rated least important (**Table 3.3**). The Friedman test confirmed significant differences among both the general motivational factors ($\chi^2(8) = 48.898$, $p < 0.001$; **Table 3.4**) and the investment-preference factors ($\chi^2(6) = 52.136$, $p < 0.001$; **Table 3.6**). Bonferroni-adjusted comparisons showed significant differences among selected motivational factors (**Table 3.5**) and investment-preference factors (**Table 3.7**).

4.3 Financial and Socio-Economic Constraints

Health and education expenses ($M = 2.86$), loan repayment ($M = 2.84$), and insufficient income ($M = 2.72$) were rated the most limiting constraints, while lack of convenient savings instruments ($M = 2.40$) was rated least limiting (**Table 3.8**). The Friedman test showed no significant difference in the overall pattern of constraint ratings ($\chi^2(5) = 9.072$, $p = 0.106$; **Table 3.9**). Mann–Whitney U tests found no significant difference between semi-medium and medium farmers on any constraint (all $p > 0.05$), though semi-medium farmers rated income- and expense-related constraints somewhat higher and medium farmers rated health/education expenses somewhat higher ($U = 197.0$, $p = 0.073$; **Table 3.10**).

4.4 Influence of Demographic and Socio-Economic Characteristics

Mann–Whitney U tests (gender) and Kruskal–Wallis H tests (age, education, occupation, income) showed no significant differences in Investment in Financial Assets, Investment in Physical Assets, or the Savings Pattern Index across any demographic category (all $p > 0.05$; **Table 3.11**). Spearman correlations were similarly weak and non-significant ($|\rho| \leq 0.21$, $p > 0.05$ throughout; **Table 3.12**), with gender ($\rho = 0.201$, $p = 0.122$) and age ($\rho = -0.207$, $p = 0.158$) showing the strongest, still non-significant, associations with the Savings and Investment Pattern Index.

4.5 Summary of Hypothesis Testing

Table 4.1: Summary of Hypothesis Testing

Hypothesis	Statistical Test	Decision
H01: There is no significant difference in the relative importance of factors influencing farmers' savings and investment decisions.	Friedman test	Rejected
H02: There is no significant difference in financial/socio-economic constraints between semi-medium and medium farmers.	Friedman test; Mann–Whitney U	Retained
H03: There is no significant relationship between demographic/socio-economic characteristics and savings-investment outcomes.	Mann–Whitney U; Kruskal–Wallis H; Spearman's ρ	Retained

Note. Decisions based on $\alpha = 0.05$.

5. Discussion

The findings indicate that savings and investment decisions among semi-medium and medium farmers are primarily influenced by precautionary, risk-related and household-security considerations. Health and medical emergencies emerged as the strongest factor ($M = 4.06$, $SD = 1.132$), followed by risk factors ($M = 4.04$, $SD = 0.925$) and safety and security ($M = 4.00$, $SD = 1.143$). This is consistent with Gaurav and Chaudhary (2020), whose field experiment in India showed that farmers' financial decisions were sensitive to perceptions of basis risk. Chhatre et al. (2023), based on 1,082 rural households, similarly found that financial inclusion helped households manage climate-related risks. These findings support the present

evidence that farmers place considerable importance on protecting household resources against uncertainty.

Tax benefits and formal financial advice were comparatively less influential. Tax benefits associated with investment recorded the lowest mean ($M = 2.40$, $SD = 1.400$), while retirement planning and financial advice were also relatively less prominent. Hiremath et al. (2024) reported that 39% of farmers in Kalaburagi had low financial literacy, 32% had moderate literacy and only 29% had high financial literacy. This may partly explain the limited importance attached to formal financial advice in the present study, although financial literacy was not directly measured. Somville and Vandewalle (2023) also found that access to banking helped rural households smooth consumption by relaxing savings constraints, highlighting the importance of accessible financial mechanisms.

Financial and socio-economic constraints were led by health and education expenses ($M = 2.86$, $SD = 1.125$), loan repayment ($M = 2.84$, $SD = 0.912$), and insufficient income or financial resources ($M = 2.72$, $SD = 1.089$). Kumar et al. (2021) found that institutional credit access among agricultural households in Eastern India was associated with demographic and socio-economic characteristics. Similarly, Sandhu (2021), using evidence from 185 farmers and 42 banks in Punjab, highlighted the importance of financial and institutional conditions in farmer–bank lending relationships. These findings reinforce the present observation that financial constraints can restrict farmers' capacity to save and invest.

No statistically significant differences were found between semi-medium and medium farmers across the six constraints. This suggests that farm-size category alone may not adequately distinguish farmers' financial difficulties. Key (2020) similarly demonstrated that credit constraints and off-farm income influence farm investment, indicating that investment capacity depends on broader financial conditions rather than farm size alone.

The analysis also found no statistically significant differences in savings and investment outcomes across gender, age, education, occupation or income categories. This differs from Pavithra and Singh (2025), who reported that access to the Kisan Credit Card scheme was associated with age, education, gender, landholding, non-farm income and institutional-credit access. The difference may indicate that demographic characteristics influence access to financial services without necessarily producing significant differences in actual investment behaviour. The relatively small sample of 50 farmers may also limit the detection of smaller relationships.

Varshney et al. (2021) found that government transfer payments increased the likelihood of agricultural investment among farming households in northern India, highlighting the potential importance of liquidity-enhancing interventions. In the present study, the prominence of insufficient income and loan repayment similarly suggests that improving liquidity and access to suitable financial resources may be more effective than relying primarily on tax incentives.

Overall, the findings suggest that farmers' savings and investment decisions are shaped more strongly by precautionary needs, risk management, household expenditure and financial constraints than by demographic characteristics alone. The study therefore supports farmer-oriented financial interventions

combining accessible savings mechanisms, affordable credit, risk-management products and practical financial education.

6. Practical Implications

The findings suggest that financial institutions and agricultural agencies should promote accessible savings products, emergency-oriented financial services, affordable credit, risk-management instruments and practical financial guidance for farmers. Greater emphasis should be placed on products addressing health emergencies, household security and liquidity needs, while financial education can improve farmers' understanding of suitable savings and investment alternatives.

7. Recommendations

Financial institutions should simplify access to formal savings and credit facilities and provide repayment schedules suited to agricultural income cycles. Financial-literacy programmes should focus on investment diversification, insurance, risk management and long-term financial planning. Policymakers should also strengthen farmer-oriented financial schemes and improve their accessibility to support sustainable savings and investment behaviour.

8. Future Scope of the Study

Future studies may use larger samples covering more districts and different categories of farmers to improve the generalisability of the findings. Longitudinal research could examine changes in savings and investment behaviour across agricultural seasons, while future studies may also incorporate financial literacy, credit access, insurance, digital financial services, non-farm income and financial risk tolerance to provide a more comprehensive explanation of farmers' financial decisions.

9. Conclusion

This study examined the determinants of savings and investment decisions among semi-medium and medium farmers in Western Maharashtra. Precautionary and security-related motives — particularly health and medical emergencies, risk factors, and safety/security — emerged as the dominant drivers, while tax benefits and retirement planning played a marginal role. Health and education expenses, loan repayment, and insufficient income were the most limiting constraints, though these did not differ significantly by farm-size category, and none of the demographic or socio-economic characteristics examined showed a significant relationship with savings–investment outcomes.

These findings suggest that financial institutions and extension agencies would benefit from designing savings and investment products around health, education, and contingency protection rather than tax incentives alone, and from making financial literacy and advisory support more accessible, since these currently exert limited influence on farmers' decisions. Because farm size and farmer profile did not significantly distinguish farmer behaviour, interventions may be better targeted at the needs and constraints that cut across the farm type and size or the demographic segment. The findings are preliminary and should be interpreted with caution due to the relatively small and geographically restricted sample ($N = 50$); further studies are needed to more widely apply the analysis to a larger, more diverse sample of people, and to include objective financial data as well as self-reported perceptions, while also using a longitudinal design that allows the data to be used to identify causal relationships over time.

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