RISK ESTIMATION IN MITIGATING POVERTY WITH A CASE STUDY

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This study investigates the impact of comprehensive livelihood risks on poverty vulnerability among rural farm households in China, emphasizing the mediating roles of subjective social status and economic confidence. Utilizing data from 4414 households and employing quantile regression and instrumental variable analysis, the research is grounded in Amartya Sen's capability approach and the Sustainable Livelihoods Framework. The findings reveal that comprehensive livelihood risks significantly elevate poverty vulnerability, with subjective social status and economic confidence acting as crucial mediators.

Keywords: Risk Estimation, Mitigating Poverty, instrumental variable analysis

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1. Introduction

Despite the nation's remarkable economic growth, poverty continues to pose a significant challenge in rural China. Farm households, in particular, face formidable challenges as they rely on agriculture for their livelihoods and cope with various environmental and economic risks (Strupczewski, 2021). These households, often engaged in subsistence farming or small-scale agricultural activities, confront a unique set of obstacles, exacerbating their vulnerability to poverty (Kuchimanchi et al., 2021).

The volatility of agricultural income stands out as a primary factor contributing to the economic fragility of farm households. Unpredictable weather patterns, natural disasters, and fluctuating market prices profoundly impact household incomes and financial stability (Rao et al., 2020).Moreover, the lack of diversified income sources and limited off-farm employment opportunities

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heighten the vulnerability of farm households, leaving them exposed to economic shocks and disruptions (Kuo et al., 2015). While existing literature sheds light on various aspects of rural poverty and vulnerability, significant gaps remain that need to be addressed. These gaps include the need for a comprehensive understanding of the interconnected dynamics of poverty and vulnerability within farm households and the role of psychological factors in mitigating vulnerability (Kuo et al., 2015). This study aims to fill these gaps by providing empirical evidence and insights into how integrated livelihood risks affect farm household vulnerability and how farmer aspirations mediate this relationship (Aring et al., 2021; Rao et al., 2020). Therefore, the objectives of this research are twofold. Firstly, it aims to empirically evaluate the impact of integrated livelihood risks on farm households' vulnerability levels, identifying and estimating different risk factors affecting varying levels of susceptibility experienced by rural households. Secondly, it seeks to understand the role of farmer aspirations as a mediator between integrated livelihood risks and vulnerability. Through these objectives, this research intends to provide evidence-based insights capable of informing rural policies and enhancing the resilience of farming communities.

2. **Theoretical Analysis and Research Hypotheses**

The theoretical underpinning of this research is deeply rooted in several key concepts and frameworks, from poverty alleviation to vulnerability analysis and psychology. A pivotal theoretical framework is Amartya Sen's capability approach.This framework illuminates the multidimensional nature of poverty and vulnerability, emphasizing that it is not just about lack of income but also about the inability to access resources and opportunities necessary for well-being (Gressel et al., 2020).

The (Sustainable Livelihoods Framework)SLF offers a comprehensive framework for understanding the intricate interplay between various assets, livelihood strategies, and external factors that shape vulnerability (Natarajan et al., 2023). The research applies the SLF lens to analyze the vulnerability's dynamic and interconnected nature in rural contexts. This theoretical foundation not only aids in framing the research questions but also guides the analysis of the empirical data within a broader conceptual framework, potentially tangibly informing policy and practice.

2.1. **Research Hypotheses**

Based on the comprehensive analysis of the factors contributing to the relative poverty of farmers, including both economic and non-economic risks, two primary hypotheses are formulated to guide the research:

Hypothesis H1: Comprehensive livelihood risks faced by farm households are positively related to their vulnerability, and comprehensive livelihood risks will significantly increase their vulnerability.

This hypothesis suggests that the various risks encountered by farm households, encompassing both static and dynamic economic and non-economic factors, contribute to increased vulnerability among these households (Pham et al., 2021). Risk events impact farmers' short-term welfare and hamper their long-term development prospects. When faced with risks such as natural disasters, economic crises, health issues, or changes in household structure, farmers may experience a reduction in their well-being (Prime et al., 2020). Such events often lead to increased consumption expenditure in the short term, depleting resources and limiting long-term development potential. Consequently, the vulnerability of farm households to poverty is heightened.

Hypothesis H2: Comprehensive livelihood risk increases the vulnerability of farm households by reducing their psychological resilience.

This hypothesis focuses on the psychological aspect of vulnerability, specifically how comprehensive livelihood risks affect the "will" or psychological capital of farmers, thereby exacerbating their vulnerability to poverty (Li et al., 2020). Poverty alleviation efforts often prioritize enhancing the psychological resilience and confidence of individuals. However, when faced with various risks over an extended period, farmers may experience a decline in their psychological capital. For instance, health shocks or prolonged periods of relative poverty can erode economic confidence and self-efficacy among farmers. This decline in psychological capital directly affects farmers' vulnerability and influences their subjective social status. As a result, the ability of poor groups to improve their social standing becomes compromised, perpetuating a cycle of vulnerability and poverty. Elaborating on Hypothesis H2:

Hypothesis H2a: Comprehensive livelihood risk increases the vulnerability of farm households by reducing subjective social status.

This sub-hypothesis posits that comprehensive livelihood risks diminish farmers' subjective social status, exacerbating their vulnerability to poverty (Zeng et al., 2021). Prolonged exposure to poverty and economic insecurity can lead to a negative perception of one's social standing, further eroding confidence and resilience.

Hypothesis H2b: Comprehensive livelihood risk increases the vulnerability of farm households by decreasing economic confidence.

This sub-hypothesis suggests that comprehensive livelihood risks, such as economic downturns or income instability, diminish economic confidence

among farmers. This reduction in confidence hampers their ability to invest in long-term development strategies and exacerbates their vulnerability to poverty (Birkmann et al., 2022).

3. **Research Design**

The research design proposed for investigating the relationship between integrated livelihood risk, psychological capital, and vulnerability to poverty among farm households in rural China is structured to offer a comprehensive understanding of poverty dynamics in these contexts. This approach enables the examination of how various risk factors impact the economic well-being of farm households while also considering the mediating role of psychological resources (Huang et al., 2023).

3.1. **Data Source**

The data for this research was sourced from the China Comprehensive Social Survey (CSS) database, which employs probability sampling across 31 provinces/autonomous regions/municipalities directly under the central government, excluding Hong Kong, Macao, and Taiwan. Given China's shift towards relative poverty alleviation since 2021, the survey data from this year is particularly relevant to capture evolving dynamics. Specifically, the research focuses on farm households within the CSS database, ensuring a representative sample of rural communities. To ensure data integrity, rigorous cleaning procedures were applied. Invalid samples with missing or inaccurate information were removed, and outliers beyond the 1% and 99% percentiles were adjusted. These steps resulted in a final sample size of 4414 data points, providing a robust foundation for analysis.

3.2. **Variable Measurement**

3.**2**.1. *Explained Variables.* The Vulnerability Measurement meticulously outlines the methodology employed to calculate poverty vulnerability among farm households using the Expectation Poverty (VEP) method. The VEP method's conceptual framework defines poverty vulnerability as the probability of a household falling below the poverty line in a future period, with future consumption as a crucial indicator of welfare. The model specification elucidates the mathematical expressions utilized to quantify vulnerability, accounting for both observed characteristics of farmers/individuals and unobserved individual effects (Das & Maji, 2023). The proposed estimation method involves a three-stage feasible generalized least squares (FGLS) approach, which aims to meticulously mitigate heteroscedasticity and provide precise vulnerability estimates.

$$Vul_{i,t} = \Pr(Y_{i,t+1} < Z) \tag{1}$$

where $Vul_{i,t}$ represents the poverty vulnerability of farm household i in period t, the probability of falling into poverty in the future; $Y_{i,t+1}$ represents the welfare level of farm householdis i in period $t+1$ (generally average household income or consumption, which is mainly referred to in this paper), and Z represents the poverty discrimination criterion, which is commonly known as the poverty line.

To estimate $Vul_{i,t}$, it is necessary to predict future consumption $Y_{i,t+1}$ and its consumption distribution. And future consumption $Y_{i,t+1}$ usually depends on individual characteristics at the current stage, i.e.:

$$Y_{i,t+1} = f(X_i, \alpha_t, e_i) \tag{2}$$

where X_i represents the characteristic variables related to farmers or individuals; α_t is a non-time-varying individual effect, expressed as a regional dummy variable and e_i is a random error term, then equation (1) can be varied as:

$$Vul_{i,t} = P(Y_{i,t+1} = f(X_i, \alpha_t, e_i) \leq Z) \tag{3}$$

In general, $Y_{i,t+1}$ obeys a lognormal distribution, for which it is only necessary to estimate the mean and standard deviation of future consumption to find the poverty vulnerability of the farm household in period t. In this paper, drawing on Chaudhuri et al. (2002), we use Amemiya's (1977) three-stage feasible generalized least squares(FGLS) method of estimation with the following steps.

First, the logarithm of per capita consumption is regressed (Eq.(4)); to eliminate the effect of individual heterogeneity, Eq. (4) also controls for a dummy variable for the region in which the sample is located. According to Eq. (4), the predicted value of current consumption $\hat{Y} = Y_{i,t}$, and the residual $\sigma_{e,i}$, are obtained.

$$LnY_{i,t} = \alpha_i X_{i,t} + e_i \tag{4}$$

Using the regressed residuals squared $\sigma_{e,i}$ as consumption fluctuations, the expected value (Eq. (6)) and variance (Eq. (7)) of the logarithmic consumption can be obtained by constructing the weight matrix used to deal with heteroscedasticity and regressing with OLS again (Eq. (5)).

$$\sigma_{e,i}^2 = X_i\theta \tag{5}$$

$$\hat{E}(\ln c_i \mid X_i) = X_i\hat{\beta} \tag{6}$$

$$\hat{V}ul(\ln c_i \mid X_i) = \hat{\sigma}_{e,i}^2 = X_i\hat{\theta} \tag{7}$$

Finally, under the assumption that the logarithm of income follows a normal distribution, the poverty vulnerability can be calculated as:

$$\hat{V}ul_i = \hat{P}(\ln Y_i < \ln Z \mid X_i) = \phi\left[\frac{\ln Z - X_i\hat{\beta}}{\sqrt{X_i\hat{\theta}}}\right] \tag{8}$$

3.**2**.2. *Core Explanatory Variables.* The Integrated Livelihood Risk Measurement section outlines the methodology employed to quantify the comprehensive risks farm households face. The research endeavors to encapsulate a broad spectrum of risks within a single index, denoted as 'W,' aiming for a holistic representation of livelihood vulnerability. This measurement approach entails a single survey question prompting farmers to recall various life situations encountered over the past year, Each item is dichotomously scored based on the farmer's response, simplifying data collection and analysis. The integrated livelihood risk for each household is then computed by aggregating scores across all items, following a straightforward summation procedure.

Defining $Risk_{ij}$ as the comprehensive livelihood risk of household i in province j, where W_{ijs} is the value of household i in province j on item s, $s = 1, \cdots, 13$

$$Risk_{ij} = \sum_{s=1}^{13} W_{ijs} \tag{9}$$

Based on the literature on comprehensive livelihood risk, the risk attributes corresponding to the following life situations are categorized here, and "other stresses and difficulties in other aspects of life" is recorded as other risks.

3.**2**.3. *Mediating variables.* The "subjective social status" and "economic confidence" of farmers serve as proxy variables for measuring psychological capital, denoted as "Chi." Subjective social status is assessed through a questionnaire asking farmers to evaluate their current socioeconomic status relative to others in the local area. At the same time, economic confidence is gauged by inquiring about their expectations regarding their family's financial situation five years from now. Table 2 provides specific assignments for these variables.

3.**2**.4. *Control variables.* This paper screens respondents' individual and household characteristics by drawing from relevant studies on poverty vulnerability and considering data availability. Individual traits include marital status, online presence, participation in pension insurance, social engagement, and trust levels. At the same time, household features comprise family size, children count, land contracts, property ownership, income, expenditures, medical and support costs, and discretionary spending. These variables, defined in Table 1

3.**3**. **Modeling Design**

3.**3**.1. *Direct Effect Model.* Given that the impact of certain factors on farm households with varying levels of poverty vulnerability can differ, and conventional mean regression may overlook such heterogeneity, a quantile regression model is employed. The quantile regression model is formulated as follows:

$$Vul_{ij} = \alpha_0 + \alpha_1 Risk_{ij} + \alpha_2 X_{ij} + \delta_j + \varepsilon_{ij} \tag{10}$$

TABLE 1. Description of variables

Variable type	Variable name	Interpretation and assignment
Interpreted variable	Poverty Vulnerability	Calculated by VEP theory
Core Explanatory Variables	Composite livelihood risk	Livelihood status assignment
Mediating variables	Subjective social status	Lower = 1, Lower Middle = 2, Middle = 3, Upper Middle = 4, Upper = 5
	Economic confidence	Much worse = 1, worse = 2, no change = 3, better = 4, much better = 5
Individual Characteristics	Marital status	Married = 1, Other = 0
	Internet access	Internet access=1, no Internet access=0
	Pension Insurance Participation	Yes = 1, No = 0
	Social Participation	Number of social activities participation
	Social trust	Very distrustful = 1,... Very trust = 10
Farm household characteristics	Household size	Number of family members
	Number of children	Number of children in the household
	Contracted area	Natural logarithm of the actual contracted area per capita
	Number of Owned Houses	Number of houses owned by the family
	Income and Expenditure	Income less than expenditure=1, Excess of income over expenditure=2, Income more than expenditure=3
	Medical Burden	Per capita health care expenditure takes the natural logarithm
	Maintenance Expenditure	Per capita expenditure on supporting parents takes natural logarithm
	Expenditure on favors	Natural logarithm of per capita expenditure on favors

In this equation, Vul_{ij} represents the poverty vulnerability of farm household i in province j, $Risk_{ij}$ denotes the comprehensive livelihood risk faced by the household, X_{ij} signifies a vector of individual and farm household level control variables, δ_j represents province fixed effects of accounting for unobservable factors varying across regions, and ε_{ij} is the random perturbation term.

Since the impact of the same factors on farm households with different levels of poverty vulnerability can vary, and using only mean regression can only capture information about the average distribution of the data at the aggregate level, a quantile regression model is used to explore the heterogeneity of the impact of comprehensive livelihood risks on the poverty vulnerability of rural farm households at different quantile points. The quantile regression model is as follows:

$$Quant_q(Vul_i \mid X_i) = X_i'\beta_q \tag{11}$$

where $Quant_q(Vul_i \mid X_i)$ represents the conditional quantile function of the quantile q of the poverty vulnerability value Vul_i of rural households given the independent variable X, X_i' is an exogenous vector variable, $0 < q < 1$, and β_q is the q quantile regression coefficient. Quantile regression minimizes the sum of the absolute values of the weighted residuals, i.e.:

$$\min\left\{\sum_{i:Vul_i \geq X_i'\beta_q}^{n} q|Vul_i - X_i'\beta_q| + \sum_{i:Vul_i \geq X_i'\beta_q}^{n} (1-q)|Vul_i - X_i'\beta_q|\right\} \tag{12}$$

This approach not only allows for an exploration of the heterogeneity in the impact of comprehensive livelihood risks on the poverty vulnerability of rural farm households across various quantile points but also provides crucial insights into how these risks affect different levels of vulnerability. This subtle understanding of poverty dynamics in rural areas is of utmost importance for academic researchers and policymakers.

3.**3**.2. *Modeling the mechanism of action.* To investigate the mechanism linking comprehensive livelihood risk, farmers' aspiration, and poverty vulnerability, the research adopts the test of mediating effect proposed by Wen Zhonglin

and Ye Baojuan (Wen & Ye, 2014). Here, a stepwise regression mediating effect model is introduced as follows:

$$Vul_{ij} = \alpha_0 + \alpha_1 Risk_{ij} + \alpha_2 X_{ij} + \delta_j + \varepsilon_{ij} \tag{13}$$

$$Spirit_{ij} = \beta_0 + \beta_1 Risk_{ij} + \beta_2 X_{ij} + \delta_j + \theta_{ij} \tag{14}$$

$$Vul_{ij} = \gamma_0 + \gamma_1 Risk_{ij} + \gamma_2 Spirit_{ij} + \gamma_3 X_{ij} + \delta_j + \sigma_{ij} \tag{15}$$

where $Spirit_{ij}$ denotes the psychological capital of farmer i in province j, which is represented by subjective social status and future economic confidence, respectively. These variables are used interchangeably to capture different aspects of psychological capital. $\varepsilon_{ij}, \theta_{ij}, \sigma_{ij}$ represent random disturbance terms in the equations, accounting for unobserved factors and measurement error.

3.4. **Empirical analysis and results test**

3.4.1. *Statistical description of variables.* Calculations show that the average poverty vulnerability of farm households is at a moderate level, but there are significant differences in vulnerability among households, with values ranging from 0 to 0.99 and a standard deviation of 0.34.The mediating variables, subjective social status and economic confidence, show moderate to high scores, indicating varied household perceptions and confidence levels. Control variables shed light on household demographics, social engagement, and financial situations, highlighting areas of potential concern.

The average number of risk shocks experienced by sample farm households in 2020 is a staggering 3.13 per household. Notably, only 722 households, constituting a mere 16.3% of the total sample, reported no comprehensive livelihood risk. The majority of households reported values between 1 and 5, indicating a significant range of risk exposures. However, a subset of households reported values between 5 and 10, underscoring the extensive array of risks faced by farmers. These findings serve as a stark reminder of the multifaceted nature of risk experienced by farm households, suggesting that addressing these challenges requires a comprehensive approach that considers the diverse array of risks rather than focusing on individual shocks in isolation.

3.4.2. *Test of the direct effect of comprehensive livelihood risk on poverty vulnerability.* Table 2 presents the results of ordinary least squares (OLS) regression and quantile regression, examining the direct effect of comprehensive livelihood risk on poverty vulnerability among farm households. The findings reveal a significant positive association between comprehensive livelihood risk and poverty vulnerability, validating hypothesis H1. Interestingly, the quantile regression results indicate that this effect varies across different vulnerability levels, with a more pronounced impact observed among households with higher vulnerability. Specifically, the regression coefficient of comprehensive livelihood risk increases as the quantile level rises, suggesting that its influence

is more substantial for households with greater vulnerability. Notably, while the OLS regression coefficient for comprehensive livelihood risk is significant, its magnitude differs from that observed in quantile regressions, indicating potential limitations in solely relying on OLS regression for explaining poverty vulnerability across the entire sample.

TABLE 2. Quantile Regression Results

Variables	OLS	Q10	Q25	Q50	Q75	Q90
Comprehensive livelihood risk	0.009***	0.003**	0.006***	0.008***	0.012***	0.011***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)
Marital status	−0.066***	−0.022***	−0.053***	−0.068***	−0.084***	−0.087***
	(0.013)	(0.009)	(0.012)	(0.018)	(0.021)	(0.031)
Internet access or not	−0.104***	−0.026***	−0.083***	−0.172***	−0.170***	−0.085***
	(0.012)	(0.008)	(0.010)	(0.016)	(0.019)	(0.027)
Pension insurance participant on	0.071***	0.010*	0.036***	0.069***	0.092***	0.053**
	(0.009)	(0.006)	(0.008)	(0.012)	(0.015)	(0.021)
Social participant on	−0.023***	−0.004***	−0.008***	−0.008*** −0.016***	−0.024*** −0.036***	−0.036*** −0.008*** −0.016*** −0.024***
	(0.002)	(0.001)	(0.002)	(0.003)	(0.003)	(0.004)
Social trust	0.003*	0.001	0.002	0.002	0.003	0.004
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)
Household size	0.059***	0.019*	0.049***	0.062***	0.065***	0.055***
	(0.002)	(0.001)	(0.002)	(0.003)	(0.004)	(0.005)
Number of children	0.032***	0.009***	0.013***	0.032***	0.055***	0.047***
	(0.005)	(0.003)	(0.004)	(0.006)	(0.008)	(0.011)
Contracted area	0.019***	0.000	0.010*	0.014	0.032***	0.032**
	(0.006)	(0.004)	(0.006)	(0.009)	(0.010)	(0.015)
Number of owner-occupied dwellings	−0.062***	−0.019***	0.037*** −0.058***	0.058*** −0.060***	−0.060***	−0.056*** −0.057*** −0.058*** −0.060***
	(0.008)	(0.005)	(0.007)	(0.010)	(0.013)	(0.018)
Income and expenditure	−0.047***	−0.007*	−0.021***	−0.040***	−0.049***	−0.059***
	(0.006)	(0.004)	(0.005)	(0.008)	(0.009)	(0.014)
Health care burden	0.002	-0.000	0.000	0.002	0.001	0.006*
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
Maintenance expenditure	−0.010***	-0.001	−0.003***	0.007*** −0.012***	−0.012***	0.012*** −0.020***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
Expenditure on favors	−0.011***	-0.002	−0.005***	−0.010*** −0.013***	−0.013***	−0.012***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.004)
Constant term	0.197***	-0.017	-0.011	0.168**	0.291***	0.472***
	(0.056)	(0.039)	(0.050)	(0.077)	(0.097)	(0.136)
Province fixed effects	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
R2	0.448	0.053	0.159	0.296	0.343	0.260

Note: Each column represents the results under each quantile regression, and the estimates are obtained by iterating the bootstrap method 1000 times; standard errors are in parentheses; , ∗, and ∗∗ represent 10%, 5%, and 1% significance levels, respectively.

The regression analysis of control variables reveals notable findings regarding their impact on poverty vulnerability among farm households. Specifically, marital status, internet access, and social participation significantly mitigate poverty vulnerability. Conversely, larger household sizes and a higher number of children significantly escalate poverty vulnerability, with this effect amplifying as vulnerability levels increase. Interestingly, the number of owned houses and expenditure on favors emerge as factors inversely related to poverty vulnerability. This suggests that more significant physical and social capital households possess are associated with lower vulnerability to poverty. These

results underscore the multifaceted nature of poverty vulnerability, influenced by various individual, household, and socioeconomic factors.

3.4.3. *The mediating effect of psychological capital test.* Table 3 presents the results of the mediation effect test, investigating whether comprehensive livelihood risk influences poverty vulnerability through the mediating mechanisms of subjective social status and economic confidence. In column (1), the primary effect model shows a significant positive relationship between comprehensive livelihood risk and poverty vulnerability, validating the basis for testing mediation. Column (2) examines the impact of livelihood risk on subjective social status, indicating a significant negative association, supporting the first link of the mediation channel. Column (3) includes comprehensive livelihood risk and subjective social status, revealing that subjective social status significantly mitigates poverty vulnerability. This suggests a partial mediating role, with subjective social status explaining 13.30% of the effect. Bootstrap sampling confirms the significance of this finding.

Table 3. Results of the Mediation Effect Test

Variables	Dependent Variables				
	(1) Poverty Vulnerability	(2) Subjective Social Status	(3) Poverty Vulnerability	(4) Economic Confidence	(5) Poverty Vulnerability
Comprehensive livelihood risk	0.009***	−0.072***	0.008***	0.008***	0.008***
	(0.002)	(0.006)	(0.002)	(0.005)	(0.002)
Subjective social status			−0.016***		
			(0.005)		
Economic Confidence					−0.023***
					(0.004)
Constant term	0.199***	1.585***	0.225***	3.134***	0.272***
	(0.056)	(0.198)	(0.057)	(0.168)	(0.059)
Bootstrap Confidence interval		[0.0046, 0.0117]		[0.0048, 0.0118]	
Sobel test		Z: 2.869 (p=0.004)		Z: 3.891 (p=0.000)	
R^2	0.448	0.121	0.450	0.151	0.451

Note: All regressions control for province fixed effects, and all control variables are consistent with quantile regressions; Sobel's test p-value is less than 0.05, and the conclusions are consistent with those obtained from Bootstrap sampling 1000 times.

Similarly, column (4) assesses the effect of livelihood risk on economic confidence, showing a significant negative relationship, supporting the first link of the mediation channel. Column (5) includes both variables, demonstrating that economic confidence significantly influences poverty vulnerability, mediating 7.81% of the effect. The Bootstrap method confirms the significance of the indirect effect. These results empirically validate the hypotheses that comprehensive livelihood risk diminishes subjective social status and economic confidence, heightening poverty vulnerability among farm households.

Table 4. Decomposition of Mediating Mechanism

Intermediary effect (Mental capital)	Mediating variable	Path coefficients		Mediating effect value	Mediating effect ratio
		XM	MY		
Subjective social status		-0.072	-0.016	0.0012	13.30%
Economic confidence		-0.031	-0.023	0.0007	7.80%

Table 4 provides a decomposition of the mediating mechanisms involved in the relationship between comprehensive livelihood risk and poverty vulnerability. Focusing on the mechanism of subjective social status, the table illustrates that the mediation effect value is calculated by multiplying the regression coefficients of comprehensive livelihood risk on subjective social status (-0.072) and subjective social status on poverty vulnerability (-0.016), resulting in a value of 0.0012. This implies that changes in subjective social status can explain 13.30% of the total effect of livelihood risk on poverty vulnerability. Similarly, for the mechanism of economic confidence, the mediation effect value is obtained by multiplying the regression coefficients of comprehensive livelihood risk on economic confidence (-0.031) and economic confidence on poverty vulnerability (-0.023), yielding a value of 0.0007. This indicates that economic confidence accounts for 7.80% of the total effect of livelihood risk on poverty vulnerability.

The analysis confirms that subjective social status and economic confidence, which are proxies for farmers' "will," exhibit significant mediation effects in the relationship between comprehensive livelihood risk and poverty vulnerability among farm households. This validates hypothesis H2, indicating that the "will" of farm households plays a substantial mediating role in exacerbating vulnerability to poverty. The findings suggest that enhancing farm households' "will" or psychological resilience can effectively mitigate their vulnerability to poverty.

4. **Discussion**

This study employs the Vulnerability as Expected Poverty (VEP) approach to quantify vulnerability, utilizes quantile regression to investigate the impact of risk on vulnerability, and adopts mediation effect analysis to explore the influence of "Zhi" (will) on vulnerability. The findings reveal that risk exhibits a significant positive effect on vulnerability, while "Zhi" also plays a mediating role in the relationship with vulnerability.

5. **Ideas for Future Research**

Future research in this area could explore longitudinal studies to track changes in poverty vulnerability over time, qualitative methods to identify contextual factors influencing vulnerability, gender analysis to address gender disparities, and the impact of climate change on vulnerability. Evaluating policy interventions, conducting spatial analysis, investigating community-based approaches, and comparative studies across regions could provide valuable insights for addressing poverty and promoting resilience in rural areas.

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