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Subjective knowledge, attitude to money and investment decisions: New insights for the farmland market

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1. Motivation

- The activities of nonagricultural farmland buyers are a focal point in recent research
- Farmland transaction data has given valuable insights about their market share and pricing (Deiningner, 2011; Noland et al., 2011; Painter, 2011)
- A huge share of those nonagricultural buyers are private persons who buy small parcels
- In Germany, nonagricultural persons own 30-40 % of the agricultural land (Meißner & Mußhoff, 2022; Tietz et al., 2021)
- From a scientific point of view, little is known about the motives of those private persons and potential factors which drive them to buy farmland
- We aim to address this point and answer the question which factors might drive non-agricultural persons' willingness to invest in farmland.
- Concentration upon four factor groups: Key investment information, attitude to money, subjective knowledge of finance and sociodemographic characteristics

2. Research question

- Which factors might drive non-agricultural persons' willingness to invest in farmland?

Key investment
information

Subjective
knowledge of
finance

Attitude to money

Sociodemographic
characteristics

- **Key investment information** is a very important determinant of investment decisions
- Also **subjective knowledge of finance** is statistically significant, in line with Hadar et al. (2013)
- Several variables describing **the attitude to money** were significant
- Also, a number of **socio-demographic characteristics** were statistically significant
- Calculation of marginal effects for a more detailed interpretation

2. Research question: Groups of Factors

Group and Factors	Variables
Key investment information	
Risk	Volatility of the returns
Returns	Returns
Asset Type	Arable Land, Building land, etc.
Subjective knowledge of finance	
Subjective knowledge	Knowledge of finance
Attitude to money	
Financial security	Household Budget
Impulsive buying	Living in here and now, money spending behavior
Attitude toward savings	Financial goals, compare prices
Socio-demographic characteristics	
Age	
Education	
Gender	
Income	

- Key investment information is derived from KIIDs (Key investor information document), which is used by funds (Blackrock, 2022; de Goeij et al., 2018)
- Subjective knowledge is asked directly, similar to Hadar et al. (2013)
- Attitude to money is profiled based on items defined by Keller and Siegrist (2006a)
- The questions for determining the attitude to money are closely related to parts of the OECD questionnaire “Measuring financial literacy” (International Network on Financial Education, 2011).

3. Data



The Data consists of two components:

- **A Discrete Choice Experiment (DCE)**
- **A Survey**

- The data has been collected with respondi in 2021 (now: bildendi respondi)
- 639 Participants answered 12 choice sets: Data has a panel structure with 7668 choices and 23004 data points
- The data is representative for Germany in terms of several socio-demographic characteristics: Gender, age, income, federal state
- Also, all levels of education are represented
- Within the dataset, profiles of each participant are generated within a questionnaire
- This profile contains information about the participant-specific investigated factors: Attitude to money, subjective knowledge of finance and sociodemographic characteristics

3. Data

- The DCE has 3 alternatives, 2 alternative-specific constants and 4 attributes

Alternative	Financial Market Investment	Farmland Investment	No investment (bank account)
Description	Investment in a financial portfolio	Purchase contract for agricultural land in your county. A rent agreement for the area is in place.	The money is in a checking account at a bank with a good credit rating. It does not earn interest and can be withdrawn in full at any time. There are no account management fees.
Alternative-specific constants	Transaction costs (one-off costs, are included in the investment amount)	1% of the investment amount (order fees) ; Time commitment: 1 day per year	10% of the investment sum (agent, real estate transfer tax, notary), time required: 5 days per year
	Possibility to sell	At any time; Time required 2 hours, liquidity after one day	At any time; Time required from several days to weeks, liquidity 1 month after sale
	Investment amount	40.000 €	40.000 €
Attributes	Type	Stocks	Arable land, good quality (50 soil points)
	Expected returns	2,9%	1,3%
	Risk (Volatility of returns)		
	Choice	<input type="radio"/>	<input type="radio"/>

3. Method: Mixed logit model

- The empirical model is a **mixed logit model** with four components:

$$U_{iat} = x_{iat}\beta_i + w_{iat}\alpha + z_{it}\delta_a + \varepsilon_{iat}$$

- With the **utility** U_{iat} which an individual i receives out of alternative a at time t
- the vectors of **alternative-specific variables** x_{iat} and w_{iat} vary over alternatives, cases and individuals.
- The vector of **case-specific variables** z_{it} varies over cases and individuals but is constant across alternatives for a given time and individual
- β_i are random coefficients which are varying over individuals
- α are fixed coefficients on w_{iat}
- δ_a are fixed alternative-specific coefficients on z_{it}
- ε_{iat} is the error term

3. Method: Mixed logit model

$$U_{iat} = x_{iat}\beta_i + w_{iat}\alpha + z_{it}\delta_a + \varepsilon_{iat}$$



Case-specific variable with fixed alternative-specific coefficient:

- Varies over cases and individuals
- Are for example characteristics like age, income or gender

Alternative-specific variable with fixed coefficient:

- Varies over cases, individuals and alternatives
- Preferences for this variable are homogenous and are modeled with a fixed coefficient

Alternative-specific variable with random coefficient:

- Varies over cases, individuals and alternatives
- Preferences for this variable might be heterogenous and are modeled with a random coefficient

4. Selected results

- Reduced model, bank is the base alternative
- * indicates $p \leq .10$; ** indicates $p \leq .05$; *** indicates $p \leq .01$
- Results are shown only for the case-specific variables for farmland and the alternative-specific variables

choice	Coef.	Std. Err.
Alternative-specific variables		
Returns	.373***	.021
Arable land	-.128***	.040
Building land	.113***	.041
Real estate fund share	-.217***	.047
Fintech	.074	.046
Investment amount	.000	.000
Risk	-.654***	.052
Random effect		
sd(risk)	1.076	.048
Farmland		
Gender (base: man)	-.520***	.159
University degree (base: no university degree)	.779***	.165
Self-assessed financial knowledge	.208***	.055
Attitude to investment value development security	.560***	.084
Compare prices	.158*	.087
Money spending behavior	-.346***	.091
Constant	.845	.597
Bank	(base alternative)	

4. Interpretation of the results

- For interpreting the results, the predictive margins and their contrasts have been calculated
- They describe the expected choice probabilities and the difference in these average probabilities

Variable	Alternative	Contrast	Std. Error
Self-assessed financial knowledge	Financial product	.111	.015
	Farmland	-.056	.013
	Bank	-.056	.013
Attitude to investment value development security	Financial product	-.126	.031
	Farmland	.282	.026
	Bank	-.157	.030
Money spending behavior	Financial product	-.054	.030
	Farmland	-.051	.028
	Bank	.105	.028
Compare prices	Financial product	-.036	.032
	Farmland	.080	.028
	Bank	-.044	.029

- A value of 5 instead of 1 on the Likert scale (higher subjective knowledge) means an increased probability of 0.111 of choosing a financial product as an investment.
- The probabilities to invest in farmland (-0.056) and to leave the money on the bank (-0.056) are reduced with increased subjective knowledge.

5. Conclusion

- **Which factors might drive non-agricultural persons' willingness to invest in farmland?**
- Several variables within the four factor groups are statistically significant for explaining investment behavior when **farmland** is included:
- **Key investment information:** Risk, returns, type of asset
- **Subjective Knowledge of finance**
- **Attitude to money:** Investment value development security, compare prices, money spending behavior
- **Sociodemographics:** Gender, education

- The consideration of more factors could be of interest
- The effect of the general economic situation has to be taken into account

Thank you for your attention!

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