Türkiye'de Tarım İşletmelerinin Sosyo-Ekonomik Profili ve Tasarruf Davranışları Arasındaki İlişki: Konya İli Örneği

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ÖZET

Bu çalışmanın temel amacı kırsal alandaki tarımsal hanehalklarının tasarruf davranışlarına etki eden faktörlerin belirlenmesidir. Bu amaca yönelik olarak Türkiye'de Konya ilinde faaliyet gösteren 268 tarım işletmesiyle anket yapılmıştır. Bu doğrultuda anketler sonucunda tarım işletmelerinin sosyo-ekonomik yapıları ve tasarruf miktarları belirlenmiştir. Türkiye gibi birçok ülkede tarım işletmelerinin sahip oldukları sosyo-ekonomik özellikler göz önünde bulundurulduğunda işletmelerin tamamının tasarruf yapamayacağı ihtimali göz önünde bulundurularak tarım işletmelerinde tasarrufları etkileyen faktörlerin belirlenmesinde tobit model kullanılmıştır. Model sonucunda yaş, aile nüfusu, sermaye, tarımsal gelir, işletme büyüklüğü ve tarım dışı gelir ile işletmelerin tasarruf miktarları üzerinde anlamlı ve pozitif etkisi olduğu belirlenmiştir. Fakat eğitim seviyesi, tecrübe ve sosyal güvence, sağlık durumu, işletme maliyetleri, kredi miktarı ve destekleme miktarının tasarruf miktarı üzerinde anlamlı ama negatif bir etkiye sahip olduğu söylenebilir. İşletmede edilen sonuçlara göre ekonomik büyüme için daha fazla tasarrufu harekete geçirmek için farklı gelir seçenekleri için alternatif kaynakların ihtiyacına işaret edilmektedir. Çünkü kent-kır fark etmeksizin yatırım fonların önemli bir kısmı gayrimenkul veya vasıta fonlarına aktarılmaktadır. Bu sebeple alternatif yatırım araçlarının desteklenerek yaygınlaştırılması gerekmekte olup tasarrufların değerlendirilmesine yönelik politika önerileri hazırlanmıştır.

The Relationship Between Socio-Economic Profile and Saving Behavior of Agricultural Enterprises in Turkey: The Case of Konya Province

ABSTRACT

The primary aim of this study is to identify the factors that impact the saving behavior of agricultural households residing in rural regions. To achieve this, a survey was undertaken with 268 agricultural households located in Konya province, Turkey. Accordingly, the socio-economic structures and amount of savings of agricultural households were determined because of the surveys. Considering the socio-economic characteristics of agricultural businesses in numerous countries, including Turkey, we utilized the tobit model to establish the factors that impact savings in agricultural businesses. The analysis showed that age, household size, capital, income from households, and off-farm business ventures have a significant and positive impact on household savings. Conversely, education level, experience, social security, health status, business expenses, loan amount, and level of subsidies have a significant and negative impact on savings. The research has highlighted the requirement for diverse income options to encourage greater savings, leading to economic growth. Due to the transfer of a substantial amount of investment funds to real estate or vehicle funds without regard to urban-rural differences, the promotion and dissemination of alternative

investment instruments is essential. Consequently, policy recommendations have been devised for the deployment of savings.

INTRODUCTION

Significant advances in agricultural technology since 1950 have transformed production patterns and structures. This has resulted in the replacement of manual labor with machinery, leading to a higher need for working capital due to intensive input use. Additionally, a changineo production intensity structures have increased the financial demands of enterprises. The progress in agriculture has stimulated contemplation regarding how and from where households capital necessities will be met. To fulfill these needs in households, internal and external financing sources are employed. Nevertheless, agricultural households are identified by restricted credit access, vulnerability to risk and uncertainty, reliance on climate, and low capital turnover. These economic and structural attributes have decreased households potential revenue, decreasing savings consequently. The poor living conditions and poverty cycle that Agricultural operators face require immediate attention. Therefore, it is crucial to examine savings, which are one of the internal funding sources, to reduce the effects of potential households risks and secure its financial sustainability.

Savings in the agricultural sector refer to the income that is not consumed in the current year and reserved for future investment, consumption, or unforeseen circumstances. Therefore, saving is the ability to control unforeseen risks in the future (Tan ve ark., 2022; Strzelecka ve Zawadzka, 2023; Zeng ve ark., 2023). Therefore, saving is an important economic behavior for households to achieve financial balance. In the world, including Turkey, internal financing programs are needed to increase agricultural production, reduce poverty, prevent income inequality, and provide access to financial services for households (Steinert ve ark., 2018; Abbas, 2022; Karaaslan ve ark., 2022). Savings, the most important internal financing program, can alleviate liquidity constraints in agribusinesses, stabilize consumption, and increase socio-economic welfare. It is emphasized that agribusinesses need to save to invest in health and education, manage household emergencies, and meet other cash needs (Littlefield ve ark., 2003; Yunus, 2006; Morduch, 2009).

Three traditional theories have been widely used in empirical studies on saving formation. These theories are the Life Cycle Hypothesis (LCH) proposed by

Modigliani (1970), the Absolute Income Hypothesis (IHH) proposed by Keynes (1936), and the Permanent Income Hypothesis (PIH) proposed by Friedman (1957). The LIH, it is aimed at maximizing the optimal utility that the individual will obtain throughout life rather than the current period, and it is known that they will consume and save according to their past and future income. Keynesian theory has identified absolute disposable income as an important determinant of saving. It defines saving as the amount remaining after subtracting the cost of consumption expenditures from the disposable income earned in each period. Friedman states that capital has a significant effect on consumption according to the SGH theory and that saving rates may vary as income varies from year to year. The implication of these theories is that income and expenditures have an effect on savings over time, the marginal benefit of saving is higher when income is low, and the marginal benefit of saving is lower when income is high. These theories have been the subject of many empirical studies and studies on saving have been conducted so far. Empirical studies have examined the behavior of entrepreneurs towards savings (Léon ve Rainelli, 1976; Spence ve Mapp, 1976; Hamaker ve Patrick, 1996; Mapesa, 2015), the relationship between income and capital accumulation and consumption and savings (Jensen ve Pope, 2004), the savings instruments used by the rural population (Horioka ve Wan, 2007; Subhashree ve ark., 2016) and the factors affecting savings in households (Gedela, 2012; Alessie ve ark., 2013; Chamon ve ark., 2013; Fletschner ve Kenney, 2014; Karlan ve ark., 2014; Komal ve Abbas, 2015; Zhou ve ark., 2019). Studies have established that saving behaviors are prevalent in agriculture in developed countries. Climatic conditions, natural disasters, and uncertainty in agricultural markets force agricultural operators to save more than operators in other sectors; there is a significant relationship between savings in the agricultural sector and income; high marginal consumption and low marginal saving tendencies prevail in low-income agriculture. In addition, studies have also found that income growth supports the life cycle hypothesis (Horioka ve Wan, 2007) and that savings rates depend on seasonal income rather than regular income (Kulikov ve ark., 2007). Studies on savings in Turkey have mainly focused on household savings, which are considered the most significant aspect of domestic

savings. In these studies, which were conducted without sectoral distinction, the reasons why household savings are low and the factors affecting it were determined (Bozkuş ve Üçdoğruk, 2007; Erdem, 2017; Zengin ve ark., 2018). In these studies, in which the main factor affecting savings is income, saving tendencies differ according to household income levels. This situation has been the subject of many studies and studies measuring saving behavior according to different household incomes have been conducted (Çiçek, 2000; Çelik, 2009; Çolak ve Öztürkler, 2012). While Cafrı (2009) found a high correlation between poverty and savings in Adana province in Turkey, other studies have revealed that the most important factors affecting savings other than income are age, education level, and social opportunities (Karataş ve Gavcar, 2001; Bozkuş ve Üçdoğruk, 2007; Çelik, 2009; Aktas ve ark., 2010). Accordingly, in parallel with the increase in the education level of households, there is an increase in their savings rates (Hayta, 2008; Kanık ve Dinç, 2017). In addition, there are studies that conclude that savings will increase with an increase in labor force participation (Ceritoğlu ve Eren, 2013). As can be seen, household saving surveys conducted in Turkey have been analyzed with macro data without considering sectoral breakdown (Çiçek, 2000; Bozkuş ve Üçdoğruk, 2007; Hayta, 2008; Çelik, 2009; Aktas ve ark., 2010; Çolak ve Öztürkler, 2012; Ceritoğlu ve Eren, 2013; Erdem, 2017; Zengin ve ark., 2018) and there is limited sectoral and area-based information. As a matter of fact, saving behavior differs even among national, regional, and local households. In macro analyses, factors such as social, economic, demographic, geographical, etc. among households are analyzed assuming that these data are constant. In addition, due to the structural and economic differences of households by sectors, in empirical studies to be conducted with savings theories, households in each sector should be analyzed with their dynamics (Kutlu, 2016; Akın, 2018). For this reason, the factors affecting the savings in the agricultural sector with their dynamics were determined in this study.

MATERIAL and METHOD
Sampling Method
The Konya province, selected as the research area, shows the highest level of capital movements in land, livestock, and equipment machinery. A stratified random sampling method was employed to select a sample of 106,833 farmers from the total population of the region, with 268 farms to be surveyed (Table 1). According to the stratified random sampling method, the number of samples to be studied was calculated using the formula below. In determining the number of samples drawn from the main mass, 5% error and 99% confidence limits were used (Yamane, 1967).

$$n = \frac{(\Sigma\, Nh.\, Sh)^2}{N^2.\, D^2 \; + \; \Sigma\, (Nh.\, Sh^2)} \qquad\qquad D^2 = d^2/z^2$$

n= Number of samples
Nh= h. Number of units in the layer
Sh= h. Standard deviation in the stratum
N= Total number of observations
D=d/z
d= Deviation from the mean at a certain rate
Z=If the number of units is above 30, z value is used in the t distribution.

After determining the number of samples, the Neyman method was used to determine a single sample volume for all strata by considering the weights of the mean and variance of each stratum, and this method aimed to increase the efficiency of sampling. The formula used to distribute the sample volume determined according to the Neyman method according to the strata is shown below.

$$n = \frac{N_h\, S_h * n}{\Sigma\, N_h\, S_h}$$

Table 1. Number of Sample Enterprises according to Enterprise Size Groups (number)
Çizelge 1. İşletme Büyüklük Gruplarına Göre Örnek İşletme Sayısı (adet)

Enterprises Size (ha)	Nh	Sh	Mean	CV	Nh*Sh	Nh*(Sh)2	n
0-5	18.888,00	9.94	3.2	31.05	187.654,98	1.864.379	18
5.1-15	28.873,00	28.47	9.15	31.09	821.892,08	23.395.788	78
15.1-50	18.900,00	81.42	24.70	32.95	1.538.797,84	125.285.651	145
50.1-+	1.477,00	195.27	60.55	32.25	288.409,85	56.317.021	27
Total	68.138,00				2.836.754,75	206.862.839,00	268

Statistical Analysis
The tobit model is widely used when there are unobservable values in the dependent variable. As a matter of fact, in recent years, it has been stated in the international literature that the model that should be used in determining the factors affecting the savings of households is tobit (Obayelu, 2013; Mapesa, 2015; Sallawu ve ark., 2016; Lidi ve ark., 2017). The tobit regression model, developed by Tobin (1958), was originally used to investigate the connection between income levels and household spending. In cases where households do not exceed a particular income threshold, their expenses were assumed to be zero. In the study, unobservable variables were either excluded

or assigned a zero value. The present inquiry aims to employ the tobit model in elucidating the factors that affect farm savings. Certain agricultural practices may not generate savings due to insufficient income. Therefore, the study used the left-censored regression (Tobit) approach to account for situations where dependent variables are not observable and take a value of zero while corresponding independent variables are observable. The study identified that 94 farmers were unable to generate savings, resulting in the savings data being incorporated into the model as "censored data."

Restricted dependent variables are estimated using both the tobit and probit models. Nonetheless, the parameters derived from the tobit model are more efficient than those from the probit model (Üçdoğruk ve ark., 2001). For this reason, the tobit model was used in this study and the general representation of this model is as follows (Greene, 2003).

$$Y_i^* = X_i\beta + \mu_i , \quad i = 1,2,\dots n$$
$$Y_i = Y_i^* \qquad if \ \ Y_i^* > 0$$
$$Y_i = 0 \qquad if \ \ Y_i^* \le 0$$

Y_i: the observed amount of household savings

Y_i^* is the latent variable which is not observed

β is the Vector of unknown parameters

X_i is the vector of independent variables affecting household savings.

In the equation, Y* is the unobservable (latent) variable, b is the (k x k) dimensional parameter vector, X is the (k x k) dimensional vector of independent variables, m is the error term and Y is the observable variables (Akgüngör ve ark., 1999). In the equation to be prepared within the scope of the Tobit model, the amount of savings is taken as the dependent variable and the independent variables are age, education, experience, social security, household size, health status, capital, agricultural income, operating costs, land size, non-agricultural income, loan amount, subsidy amount and household consumption. In this study, which examines how the saving behavior of the operator changes according to demographic, financial, and environmental factors, in particular, the effects of these resources on savings were investigated since there are studies in the literature (Mishra ve Chang, 2009) that the amount of support provided not only reduces their profitability by reducing their savings opportunities but also reduces the level of social welfare. Among the demographic factors included in the model, variables such as age, education, gender, marital status, social security status, and health status will be obtained through surveys, and the capital structure of household, the value of movable

and immovable assets, annual operating results, land size, subsidy amount, loan utilization amount and household consumption expenditures are included in the model.

The Tobit model is formulated in a manner analogous to that of a standard regression model. However, in this case, the observability of the dependent variable is controlled by a limiting mechanism. In the Tobit model, the limiting mechanism causes the observed dependent variable to remain below or above a certain threshold. This necessitates the utilization of specific methodologies for the estimation and analysis of the model. Censoring is typically classified into two principal categories: left censoring and right censoring. Left censoring occurs when the dependent variable is situated below a predefined threshold value, whereas right censoring occurs when the dependent variable is positioned above the specified threshold value. In this context, the Tobit model with left censoring is employed and expressed as follows:

If the observed y_i;

$$\begin{cases} Y_i^* \ if \quad L \ < \ y_i^* \ < U \\ \quad L \ \ if \ y_i^* \ \ge L \\ \quad U \ \ if \ y_i^* \ \ge U \end{cases}$$

In this context, *L* represents the lower bound and U the upper bound. Once the bounds have been established, the tobit model is estimated using the maximum likelihood method. This method is designed to identify the values of the model parameters that maximize the probability density function. The probability density function (PDF) and log-likelihood function of the Tobit model are defined as follows.

$$L\left(\beta, \sigma \mid y\right) = \prod_{i=1}^{n} \left[\Phi\left(\frac{\beta' x_i}{\sigma}\right)\right]^{1-d_i} \left[\frac{1}{\sigma}\emptyset\left(\frac{y_i - \beta' x_i}{\sigma}\right)\right]^{d_i}$$

In this context, Φ represents the cumulative distribution function of the normal distribution, whereas ∅ denotes the density function of the normal distribution. d_i serves as an indicator of whether the observations are restricted. The maximum likelihood method estimates the parameters by maximizing this log-likelihood function. This method is employed to estimate the parameters of the model with greater accuracy and to consider the effects of the restricted data. The log-likelihood value, AIC, and BIC criteria, and p-values are utilized to ascertain the performance of the model.

RESULTS and DISCUSSION
The development and continuity of agriculture rely on the creation of internal resources. Since the employment of external resources is limited and such resources are not adequately developed for high-yield investments, the importance of internal financing

resources increases. In addition, the shallow financial system in the agricultural sector, coupled with low savings levels, further emphasizes the significance of creating internal resources in the agricultural sector of Turkey. The analysis of the elements influencing savings rates and net profit margins in agriculture bestows significant revelations facilitating the formulation of strategies that can augment the sector's potential to create internal wealth. The amelioration of domestic savings can remarkably advance investments, thereby fostering economic growth.

Table 2. Variables in the Prediction Model Used to Determine the Factors Affecting Amount of Savings.
Çizelge 2. Tasarruf Miktarını Etkileyen Faktörleri Belirlemek için Kullanılan Tahmin Modelindeki Değişkenler.

Variable Name	Description	Expected
Age	Year	+/-
Education	(1: Primary School, 2: Middle School, 3: High School, 4: University)	+
Experience	Year	+/-
Social Security	(0: None, 1: SSI, 2: Insured Self-Employed Institution, 3:Retirement Fund, 4:Green Card)	+/-
Household Size	Number	+/-
Health Status	(1: Very Bad, 2: Bad, 3: Fair, 4: Good, 5: Very Good)	-
Capital	$	+
Agricultural İncome	$	+
Operating Cost	$	-
Land Size	ha	+
Non-Agricultural İncome	$	+/-
Loan Amount	$	+
Subsidy Amount	$	+
Household Consumption	$	-

Therefore, to identify appropriate policies that can improve resource availability for development, it is essential to comprehend the objective factors that drive household savings. Thus, the study examined the determinants of savings in the agricultural industry.

Within the study, the analysis of factors that affect savings rates in households is divided into two groups: endogenous and exogenous. The former includes the personal characteristics of operators and economic structures in households, which are examined using micro-level data. The latter, however, is categorized at a macro level and consequently determined to have side effects on operators' savings. The analysis focuses on the personal factors that pertain to the household, particularly the characteristics of the household head. In rural regions, the head of the household holds significant influence in family decision-making and affects a range of familial behaviors, such as saving. The household head's age, gender, education, expectations, socio-cultural background, health status, and psychological state can result in distinct approaches. Empirical studies reveal that savings of household differ depending on these factors (Bozkuş ve Üçdoğruk, 2007; Mishkin, 2007; Özcan ve Günay, 2012; Temel Nalın, 2013; Şengür ve Taban, 2016). The characteristics, desires, and aspirations of households in households are of great importance for expenditure and savings. However, in addition to these, some factors (economic and environmental) have an impact on savings. In this case, determining which other factors besides demographic factors affect savings behavior and formulating policies in this direction are among the first things to be done.

Farm savings are affected by internal factors, including farm income, farm size, working capital, and household average ratios, as well as external financial factors, such as inflation, exchange rates, loan interest rates and utilization, and public savings. Environmental factors such as climate change, technological advancements, risks and uncertainties, population pressure, and market instability can restrict the economic mobility of agricultural practices, resulting in fluctuations in savings and expenditure rates. The macro-level analysis is commonly used to evaluate savings and expenditures, while the influence of financial factors on savings is measured through time-series analysis in micro-level studies. Therefore, this study has identified endogenous factors that impact savings formation and expenditures, playing a crucial role in achieving capital accumulation within the agricultural sector. Recommendations have been prepared for policymakers based on these findings.

The savings behavior of agricultural households is influenced by the demographic, economic and social characteristics of the operator, alongside macroeconomic indicators and environmental factors. To examine the factors that impact savings, we created a Tobit regression model that incorporates these

variables. Descriptive statistics of the variables used for the analysis are given in Table 3. The results of the analysis showed the necessity of using a one-sided Tobit model with left-hand and right-hand censoring.

We have identified twelve farms classified as censored, which report no savings (i.e. savings <= 0). Consequently, the model is one-sided.

Table 3. Descriptive Statistics on Factors Affecting Agricultural Savings
Çizelge 3. Tarımsal Tasarrufları Etkileyen Faktörlere İlişkin Tanımlayıcı İstatistikler

Variables	Mean	Mod	Standard Deviation	Minimum	Maximum
Savings Amount	70582.03	-63554.62	647878.56	-63554.62	4460050.78
Age	51.82	65.00	13.40	18.00	77.00
Education	1.76	1.00	0.96	0.00	4.00
Experience	28.76	30.00	13.40	3.00	60.00
Social Security	1.36	1.00	0.55	0.00	3.00
Household Size	3.74	2.00	1.86	1.00	10.00
Health Status	3.46	5.00	1.44	1.00	5.00
Capital	3525309.46	1106000.00	3511417.79	307000.00	35533500.00
Agricultural Income	520084.39	23623.73[a]	695543.76	23623.73	4684962.57
Operating Costs	315454.79	21184.50[a]	296021.52	21184.50	2485979.42
Farming Size	281.64	60.00[a]	354.02	0.00	4200.00
Non-Agricultural Income	24707.99	0.00	47063.23	0.00	521000.00
Loan Amount	172492.54	0.00	322847.38	0.00	3000000.00
Support Amount	35998.93	0.00	129101.32	0.00	1405500.00
Household Consumption	96978.75	42960.00	58453.85	10656.00	272412.00

The operator's age constitutes the initial personal factor in the model, interacting with other factors such as experience, financial status, and goals. Technical term abbreviations are elucidated upon first use. The results of our modeling indicate that age has a notable positive effect on savings, with a statistical significance of $p < 0.15$ (for details, please refer to Table 4). In fact, those anticipating a decrease in their future income tend to save enough to cover their consumption expenses. Conversely, if the expectations for the future are optimistic, they tend to save less. This can account for why the population who are not in employment and especially the elderly who have retired save comparatively less than those who are employed. Although individuals may encounter limitations when saving during their youth and old age, they typically have a higher tendency to save during their working years (Modigliani, 1970). It is therefore anticipated that savings will rise in line with an increase in the proportion of the population engaged in productive work. In other words, savings are likely to grow in tandem with an expansion in the employment rate of the active population. (Lahiri, 1989; Edwards, 1996; Thimann ve Dayal-Gulati, 1997; Loayza ve ark., 2000).

The second most important personal factor affecting savings is "education" (Table 4). In the Tobit model, education has a positive and significant effect on the amount of savings ($p<0.10$). While individuals with higher levels of education are known to save more, savings show a reverse trend as the level of education decreases (Bernheim ve ark., 2001; Qi ve ark., 2004; Cilasun ve Kirdar, 2009; Aktas ve ark., 2010; Özcan ve Günay, 2012; Temel Nalın, 2013; Şengür ve Taban, 2016). In some empirical findings, a negative relationship between savings and the education of the head of the household has been determined and it has been determined that savings decrease as the level of education increases due to higher wages spent on education (Burney ve Khan, 1992; Abid ve Afridi, 2010). Individuals with higher levels of education possess greater financial assets than their less-educated counterparts. As a result, raising the country's overall education level would promote an increase in national savings rates. In essence, the so-called "Theory of Bounded Rationality" and related mindset positing that emotions and thoughts prevent individuals from acting rationally, is not particularly fitting for agricultural operators. It has been revealed that with an increase in the education level of operators, their income tends to increase, leading them to save for specific purposes. Furthermore, higher education is associated with higher income, and the low investment in education by low-income farmers may contribute to transferring income inequality across generations. Therefore, it is necessary to enhance the level of education to develop human capital and increase savings, contributing to the economic growth of the country, region, and agriculture. Additionally, "experience" (Table 4) is another endogenous factor that affects savings in households, referring to the accumulation of experience by agricultural operators, promoting specialization and sustainable production in the agricultural industry. Therefore, experience enhances the potential to produce under market conditions and is a crucial acquisition for building strategies against

hazards and uncertainties. Households with extensive knowledge and proficiency not only in cultivation but also in the market, marketing, economy, consumer behavior, and various other aspects can utilize their

production resources judiciously and shape their socio-cultural existence accordingly. It was discovered in this investigation that expertise enhances the sum of savings (p<0.15).

Table 4. Factors Affecting Agricultural Savings in Farm
Çizelge 4. Çiftlikte Tarımsal Tasarrufları Etkileyen Faktörler

Tobit regression				Total Number of Observations	=	268
				Maximum Likelihood Ratio	=	184.54
				Significance Level > Chi-squared	=	0.0000
Log likelihood function= -3715.202				Coefficient of Determination	=	0.6593

	Coefficient	Standard Error	t	P>|t|	[95% Confidence İnterval]	
Age	783.6879	3383.719	0.23	0.117****	-5880.032	7447.407
Education	59890.82	34967.64	1.71	0.088***	128754.3	8972.625
Experience	4552.032	3235.412	1.41	0.111****	10923.68	1819.619
Social Security	3963.889	54741.87	0.07	0.042**	-103841.9	111769.7
Household Size	-5734.708	16877.16	-0.34	0.034**	-38971.69	27502.28
Health Status	-17688.11	20588.6	-0.86	0.091***	-58234.22	22858.01
Capital	.0098176	.0099717	0.98	0.126****	-.00982	.0294553
Agricultural Income	.4690053	.1104686	4.25	0.000*	.2514543	.6865563
Operating Costs	-.399559	.3350225	-1.19	0.034**	-1.059335	.2602168
Farming Size	731.3031	121.5947	6.01	0.000*	491.8409	970.7652
Non-Agricultural Income	.2595576	.6825522	0.38	0.104****	-1.084625	1.60374
Loan Amount	-.8002965	.1077735	1.11	0.067***	-.2922731	.1322138
Support Amount.	-.1836924	.2442531	-0.75	0.053***	-.6647116	.2973269
Household Consumption.	-.2831779	.5060649	-0.56	0.076***	-1.279796	.7134398
Constant	264194.6	218420.2	1.21	0.028**	-165950.7	694339.9
	468066	20748.64			427204.7	508927.3

p-value: *.000, **.005, ***.010, ****.015
12 Number of left-censored observations
256 Number of uncensored observations
0 Number of right-censored observations

"Social security", classified as an endogenous factor impacting savings in agriculture, offers the state guarantee for operators to sustain their livelihoods, primarily in terms of health and income (Table 4). Alongside the growth of insurance frameworks, private insurance businesses furnish substantial future coverage. These insurances are sometimes denominated as precautionary savings, and operators can gain from these insurance processes against possible risks. Although a positive correlation exists between the insurance system and savings in developed countries, a comparable effect was also observed in Turkish households (p<0.05).

Households have embraced the agricultural sector as a way of life and continue its activities as part of a socio-cultural lifestyle. This is particularly evident in small-scale households, were low incomes and lack of socio-cultural infrastructure impact savings. In numerous household situations, socio-cultural needs increase

with household size. Moreover, resources are transferred out of agriculture, which is expected to have a negative impact on agricultural savings. The empirical analysis reveals that agricultural savings are negatively impacted by "Household size" (p<0.05). This outcome concurs with the conclusions drawn from empirical studies (Browning ve Lusardi, 1996; Loayza ve ark., 2000; Abid ve Afridi, 2010; Obayelu, 2013). There is a significant correlation between the "health status" and agricultural savings, with the knowledge that greater savings are made in the case of unexpected future health-related situations (p<0.10). Further analysis has confirmed this and revealed that the health status of the operator indeed has an adverse impact on savings (Table 4).

In the Turkish economy, there is a need for macro policies that will increase income, increase production, and reduce economic vulnerabilities. This is also true for savings, and the second of the endogenous factors

affecting agricultural savings is "economic factors". While economic indicators in the world and in Turkey have a rapid change trend, it is important for savers to adapt to this trend. Increasing "business income", which is the most important among economic factors, affects the financial situation of the household and increases savings. Especially in developing countries, income plays an important role in determining household savings. Indeed, the willingness and ability to save depends on having more resources than those allocated to basic needs.

An increased income results in higher cash inflows for a business, thereby impacting its ability to save and boost its financial stability. Moreover, business owners have more opportunities for savings. By utilizing the additional income, businesses can invest, establish emergency funds, or make long-term savings, ultimately enhancing their financial security and facilitating their expansion and growth prospects. When analyzing the relationship between business income and savings using the Tobit model, it is shown that agricultural income has a positive impact on savings ($p<0.01$). Additionally, it is estimated that increasing the income will also increase the amount of savings, as shown in Table 4.

Working capital is another significant economic factor in the model, with intensive capital being necessary to meet population pressure in agricultural production. Implementing technology requires capital, making it an asset. Productivity can be best achieved through the rational use of capital. The excessive use of fixed capital leads to increased interest and depreciation costs, resulting in higher operating costs. It is crucial to maintain a balance between capital items for the sustainability of the household. Thus, savings are necessary for rationalizing working capital. Within the context of this study, Table 4 shows that a capital increase has a positive effect ($p<0.15$) on savings in the household industry. It is anticipated that a further increase in capital will lead to further savings.

Another factor that affects internal savings in households is the cost of operating. This cost encompasses both fixed and variable expenses resulting from production activities in the household and is projected to negatively impact savings. The study found a negative effect of operating costs on savings ($p<0.05$). Hence, it is anticipated that decreasing operating costs will lead to increased profits and, in turn, result in higher savings (refer to Table 4).

The size of farms is an additional economic factor influencing savings. In fact, 99% of agricultural operations in Turkey are considered small and below the optimum scale, resulting in decreased savings. This study produced a similar outcome, identifying that the size of a farm has a positive effect ($p<0.01$) on the amount of savings (Table 4). Policies that promote household expansion can aid in savings and capital accumulation. However, the household industry faces challenges in auditing, informality, and under-reporting activities, impeding the ability to increase savings. Ultimately, the impact of financial variables on savings hinges on sectoral development.

Within the scope of the study, the impact of exogenous factors on savings is analyzed with the support of the literature by utilizing macro indicators as well as micro indicators. Accordingly, it is observed in the literature that the real exchange rate has a negative effect on savings (Montiel ve Servén, 2008; Hassan ve ark., 2011; Torun ve Karanfil, 2016). Especially in an import-oriented economy, the appreciation of the exchange rate against the value of the national currency causes production to become more expensive, which in turn leads to a decrease in production and loss of income. Therefore, monetary and exchange rate policies are needed to control overvaluation. In addition, policies and measures aimed at limiting rapid credit growth that encourages consumption growth will increase savings.

Apart from income and exchange rates, the most important factors affecting savings are "interest rates and inflation". An increase in interest rates increases savings. Empirical studies have shown that interest rates increase saving tendencies in developed countries (Koskela ve Virén, 1982; Balassa, 1992). This is the case in the Turkish economy and especially the decline in interest rates has caused savings to move downwards. When the changes in interest rates between 1998-2018 are analyzed, it is seen that the decline in interest rates and inflation has led to a downward trend in household savings. In countries with high interest rates and inflation, savers prefer different investment channels (Schaefer, 1993). Therefore, following economic trends is important for the evaluation of savings.

In recent years, fluctuations in agricultural incomes have resulted from changes in supply and demand structure, consumption habits, and increased production costs. To offset income shortfalls, farmers often rely on alternative sources of income. Pension, rental income, salary, and profit partnerships are common examples of additional income sources within the agricultural industry. In this study, we incorporated income from non-agricultural sources into the model under the assumption of a positive impact on savings. The results of our analysis, as presented in Table 4, indicate a statistically significant positive effect at the 0.15 level.

The global and Turkish markets have seen a surge in demand for agricultural products, the principal source of essential nutrients, prompting increased production to meet this demand. However, in Turkey, as well as globally, arable land has reached its maximum capacity. The only way to increase agricultural production is by improving productivity per unit area

or animal. Achieving this higher productivity is directly linked to the intensive use of capital. Thus, farmers must rely on their savings to meet this challenge. When farmers utilize external resources for intensive capital utilization, they may require more external resources if the harvest income falls below expectations. This can lead to decreased sustainability of the household. The research conducted revealed that increased credit usage has a negative effect ($p < 0.10$) on savings (refer to Table 4). Consequently, we can conclude that greater credit usage reduces the tendency to save in households.

Other factors that facilitate the shift from agriculture to other industries include the significant reliance on weather patterns in agricultural production, the prevalence of risks and uncertainties, and the instability of prevalent market conditions. These obstacles create disparities in earnings among farmers. As a result, the agricultural sector is sustained to minimize these inequalities and guarantee the acquisition of capital. In Turkey, around 25 billion TL is allocated to the agricultural sector via public subsidies (Kıymaz, 2023). However, there are empirical studies indicating that the amount of support provided to households not only reduces their profitability by reducing their savings opportunities but also reduces the level of social welfare (Mishra ve Chang, 2009). The Tobit model was employed to examine the impact of public subsidies on the savings rates of households. The analysis revealed a negative effect of subsidies on savings ($p<0.10$) (Table 4), indicating that agricultural support measures in Turkey decrease savings. Savings ought to be deemed a risk management instrument, as it stabilizes operators' income, enkindles deposit-taking during times of excess income, and furnishes cash flow during low-income periods. Thus, agricultural households can meet their subsistence and operating expenses by using their savings and can secure their income without relying on state intervention through the creation of a precautionary fund for household managers and their families.

"Consumption expenditures" refers to necessary expenses such as food, healthcare, transportation, communication, social and cultural activities, and so forth, within a year - another factor impacting savings in households. Humans are social beings who aim to satisfy other needs after working for a certain time. Therefore, consumption expenditures are made to enhance individuals' productivity and maintain their livelihood. Despite the known issue of the impact of consumption expenditures on savings, they have been incorporated into the model to assess their strength of influence. Analysis suggests a significant and strong positive impact of consumption expenditures on savings, along with a negative and statistically significant effect ($p<0.05$) (refer to Table 4).

Environmental factors that affect savings in agricultural households were not considered in the model due to the necessity for macro data, and the relevant data set will be treated as a time series. However, climate conditions, soil fertility, water resources, market conditions, and risks and uncertainties do impact the profitability of agricultural household and its ability to save. Developing risk management strategies and making long-term plans are crucial for efficient households. However, in macro analyses, particularly in relation to climatic factors, it is essential to follow pertinent statistics over time. Therefore, evaluating the impact of environmental factors using cross-sectional data is not considered appropriate.

CONCLUSION and RECOMMENDATIONS

An understanding of the factors influencing savings formation in the agricultural sector is of great value in the design of policies that enhance the sector's capacity to generate internal resources. It is anticipated that the findings will provide valuable information that can be utilized in the formulation of effective policies that favor the household community. The objective of this study is to examine the relationship between individual and economic variables and the level of agricultural savings. The Tobit regression analysis indicates that age, household size, capital, agricultural income, farm size, and non-agricultural income exert a significant and positive influence on farm savings. It can therefore be posited that as the age, household size, capital, agricultural income, farm size, and non-farm income of operators increase, savings are expected to increase. Conversely, a decline in educational attainment, coupled with inadequate social security, deteriorating health, rising operating costs, loan values, and subsidies, have a significant and detrimental impact on savings levels. It is noteworthy that lower levels of education are associated with lower levels of savings, and business expenditures lead to an increase in total expenditures, reducing disposable income and causing a decline in total savings.

It is therefore recommended that alternative sources of income be investigated with a view to stimulating economic growth by mobilizing greater savings. As the data analysis reveals, a significant proportion of investment capital in Turkey is allocated to real estate or vehicle funds, irrespective of location. It is therefore imperative to provide support and encouragement for alternative investment instruments, rather than relying on property ownership as the sole mechanism for investment. Firstly, it is of great importance to enhance existing incentives, such as those pertaining to housing account contributions, the KKDF, and the BITT, for first-time buyers. Another issue that requires attention is the way tax arrangements, such

as those pertaining to value increase and property tax, are structured. This is with a view to preventing the acceptance of real estate and vehicles as investment instruments if a second real estate asset is owned. Furthermore, it is recommended that practices for opening savings accounts by expenditure items be implemented in agricultural enterprises, considering the amount and the duration of the amount in the account. It would be beneficial for the government to provide state support for the establishment of a small number of aggregated savings accounts, which should then be made widespread. Savings accounts should be established for expenditures on education, health, holidays, culture, etc., especially for consumption goods, and savings accounts should be established with the help of tax deductions, incentives, or other monetary mechanisms.

Upon analysis of the data in Turkey, it becomes evident that a considerable proportion of investment funds are directed towards real estate or vehicle funds, irrespective of whether the location in question is urban or rural. It is therefore necessary to provide support and promote alternative investment instruments, rather than housing ownership as an investment vehicle. One approach to achieving this would be to guarantee existing investment funds. It is also important to ensure the reliability of mutual funds to attract the savings of enterprises into the system. Finally, it would be beneficial to provide guarantees for the funds of agricultural enterprises, which could be secured by supporting appropriate sectoral and non-sectoral investment funds.

It is anticipated that as the level of education within households increases, so too will awareness of the importance of savings and the role of savings institutions. It is, therefore, crucial to prioritize the raising of awareness and the provision of support to households through the implementation of targeted training and awareness programs, which are designed to address the specific needs of agribusinesses. In this context, the dissemination of information using brochures, booklets, educational visual aids, seminars, and training activities to different segments of the population is of paramount importance. The objective is to enhance comprehension of the principles of saving, investment, budgeting, and financial planning. It is essential to promote a range of financial products and services and to facilitate an understanding of the risks associated with financial markets. This will enable individuals to make informed decisions and to apply for assistance when necessary. It is of the utmost importance to implement initiatives that will enhance financial awareness within the community. Seminars, conferences, and TV radio programs can serve as effective platforms for disseminating knowledge on financial literacy. Training modules on fundamental financial concepts, budget planning, credit and debt

management, and saving methods should be developed for agricultural enterprises and farmer organizations. The involvement of all relevant stakeholders, particularly universities, is crucial in the preparation of these training modules.

It is recommended that policy interventions in Turkey prioritize enhancing the accessibility and availability of financial institutions in rural areas, with the objective of fostering household savings. It is important to acknowledge that financial services such as loans and subsidies have a detrimental and pronounced effect on savings. It is, therefore, imperative that loans, grants, incentives, and subsidies be restructured to guarantee the economic sustainability of agriculture and promote diversification. It is recommended that state-supported financial systems be established with the objective of increasing the proportion of savings that are converted into investments. In this context, the promotion of mobile applications and web platforms that facilitate communication between agricultural operators and financial institutions should be encouraged. Such systems must be based on an accurate assessment of credit risks, which can be achieved through the analysis of agribusiness data and the utilization of artificial intelligence-supported credit evaluation systems. Furthermore, efforts should be made to specialize in agricultural loans by establishing local public and private banks and diversifying collateral in financial services, as well as accepting alternative collateral sources. In particular, the bureaucratic obstacles between financial institutions and agricultural operators should be removed and the legislation on agricultural loans should be simplified. Furthermore, the establishment of funds that provide credit guarantees specific to the sector should be supported. Another action to be taken in this area is to reinforce the financial structures of cooperatives and unions. At the level of cooperatives and unions, collective credit should be made available with the objective of reducing the costs associated with buying and selling transactions, as well as the costs borne by members. Professional consultancy services should be made mandatory, and the financial management skills of these organizations should be enhanced. It would be beneficial for these organizations to establish funds in which members can make collective savings, and to encourage the utilization of these savings for joint investments. Another significant issue is the inverse correlation between public subsidies and savings. It is therefore necessary to combine appropriate items by providing subsidies on an enterprise basis and to ensure the traceability of these transfers by providing them to micro-enterprises.

In conclusion, it can be argued that an increase in the financial savings of agricultural operators will support

the sustainability of agricultural production and ensure their economic security. In order to achieve this, a number of strategies should be adopted, including training programs, government support, digitalization, the strengthening of cooperatives, and the improvement of banking services. By implementing these measures, it is possible to increase the level of financial awareness of farmers, thereby enabling them to save and become economically stronger.

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Summary of Researchers' Contribution Rate Declaration

The authors declare that they have contributed equally to the manuscript.

Conflict of Interest Statement

We declare that there is no conflict of interest between us as the article authors.

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