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# Determinants of household financial fragility in Türkiye

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## ARTICLE INFO

## ABSTRACT

The study aims to examine the determinants of household financial fragility in Türkiye. It also demonstrates that household financial fragility is a significant indicator of household economic well-being and hidden poverty. The analysis is based on microdata from the Life in Transition Survey (LiTS) IV, carried out by the European Bank for Reconstruction and Development (EBRD) and the World Bank (WB) in 2022-2023. The study defines households' financial fragility as a household's inability to meet unexpected expenditures, while households that can meet them are considered financially resilient. Due to the binary nature of the dependent variable, a logistic regression model is used in the study. Descriptive statistics indicate that 52.54% of households are financially fragile. The results of the logistic regression analysis reveal that economic and sociodemographic factors, including income level, employment status, borrowing ability, current financial situation, home ownership, age, marital status, education level, and the presence of elderly household members in need of care, determine household financial fragility. Accordingly, higher levels of education, higher income, borrowing ability, employment status, home ownership, being married, being between the ages of 25 and 34, and being debt-free reduce the likelihood of household financial fragility. On the other hand, the presence of elderly individuals in need of care in the household and individuals with secondary education or below increases the household's financial fragility. The significant impact of socioeconomic factors, such as low income and low levels of education, suggests that financial fragility reflects deeper structural poverty and inequality.

## Türkiye'de hanehalkı finansal kırılganlığının belirleyicileri

## MAKALE BİLGİSİ

## ÖZ

Bu çalışma, Türkiye'de hanehalkı finansal kırılganlığının belirleyicilerini araştırmayı amaçlamaktadır. Ayrıca, hanehalkı finansal kırılganlığının hanehalkı ekonomik refahı ve gizli yoksulluğun önemli bir göstergesi olduğunu ortaya koymaktadır. Analiz, Avrupa İmar ve Kalkınma Bankası (AİKB) ve Dünya Bankası (DB) tarafından 2022-

2023 yıllarında yürütülen Geçiş Dönemi Yaşam Araştırması IV'den elde edilen mikro verilere dayanmaktadır. Çalışmada, hanehalkı finansal kırılganlığı, bir hanehalkının beklenmedik harcamaları karşılayamaması olarak tanımlanırken, beklenmedik harcamaları karşılayabilen hanehalkları ise finansal olarak dirençli kabul edilmektedir. Bağımlı değişkenin ikili yapısı nedeniyle, çalışmada lojistik regresyon modeli kullanılmıştır. Betimsel istatistikler, hanehalklarının %52,54'ünün finansal olarak kırılgan olduğunu göstermektedir. Lojistik regresyon analizinin sonuçları, gelir düzeyi, istihdam durumu, borç alabilme durumu, mevcut finansal durum, ev sahipliği, yaş, medeni durum, eğitim düzeyi ve hanede bakıma muhtaç yaşlı bireylerin varlığı gibi ekonomik ve sosyodemografik faktörlerin hanehalkı finansal kırılganlığını belirlediğini ortaya koymaktadır. Buna göre yüksek eğitim düzeyi, yüksek gelir düzeyi, borçlanma kabiliyeti, istihdamda olma durumu, ev sahibi olmak, evli olmak, 25 ve 34 yaş arasında olmak ve borçsuz olmak hanehalkı finansal kırılganlık olasılığını azaltmaktadır. Diğer yandan, hanede bakıma muhtaç yaşlı bireylerin bulunması ve bireylerin ortaokul ve altı düzeyde eğitime sahip olması hanehalkının finansal kırılganlığını arttırmaktadır. Düşük gelir ve düşük eğitim düzeyi gibi sosyoekonomik faktörlerin önemli etkisi, finansal kırılganlığın daha derin yapısal yoksulluk ve eşitsizliği yansıttığını göstermektedir.

**Anahtar Kelimeler:**
hanehalkı finansal kırılganlığı, yoksulluk, lojistik regresyon, Türkiye.

## 1. Introduction

The notion of household financial fragility first gained prominence following the financial crisis in the United States in 2007–2008 (Demertzis, Domínguez-Jiménez and Lusardi, 2020, p. 2). The economic uncertainty that emerged after the crisis increased financial vulnerability, making it a popular research topic. Large-scale crises can have a severe impact on families' economic stability, making it harder for them to meet financial obligations such as debt repayments, rent and utility bills. Consequently, households become more financially vulnerable and less able to handle unexpected expenses. The related literature defines financial fragility in various ways, most commonly describing it as the inability to cover unexpected expenditures or the capacity to deal with unexpected financial shocks (Lusardi, Schneider, and Tufano, 2011; Dushku, 2023), the inability to settle financial debts (Jappelli, Pagano, and Di Maggio, 2010), and the failure to balance the budget or meet monthly expenditures (McCarthy 2011; Anderloni, Bacchiocchi, and Vandone, 2012). Considering these various perspectives, this paper aims to evaluate household financial fragility by examining a household's capacity to handle unforeseen expenditures. In this context, financial fragility implies the inability of individuals to deal with unexpected events such as job loss, changes in loan interest rates, reduction in salaries and working hours, etc. In other words, financial fragility refers to the level of resilience of households to sudden economic shocks.

Since household vulnerability is primarily a result of macro-level fragility, increased attention to micro-level vulnerability has also enhanced interest in broader macro-level vulnerability. A household's vulnerability depends on how large a risk it faces (shock), how open it is to that risk (exposure), and how effectively it can weather that risk (resilience) (Guillaumont, 2009, pp. 194-195). Shocks are sudden events that reduce well-being and are classified as economic shocks, natural disasters, or idiosyncratic shocks. Economic shocks affect the entire society, while idiosyncratic shocks such as job loss and illness affect only individuals or households. The concept of vulnerability is described as the tendency to be exposed to negative shocks and the degree to which one is exposed to external threats, including economic shocks and natural disasters (Feeny, McDonald, Miller-Dawkins, Donahue, and Posso, 2013, p. 1). The concept of "vulnerability" is used by various disciplines. This concept has a multifaceted meaning that varies according to different objectives and perspectives (Modica, Reggiani, and Nijkamp, 2018, p. 3). Vulnerability has no single definition and is a complex and multidimensional concept. Yet, vulnerability is generally recognised as an ex-ante or forward-looking measure of welfare.

This characteristic distinguishes it from the notion of poverty, which evaluates the current state of welfare.

Vulnerability, at the household level, is frequently described as the likelihood or risk of becoming impoverished or descending into poverty in the future. Namely, vulnerability measures the likelihood that a household will be driven into poverty in the face of a future shock, rather than reflecting its current impoverished status. Because poverty is measured in various ways, vulnerability is also conceptualised differently. Vulnerability relies on both the character of shocks or risks and a household's capacity to respond. It also involves relational factors: the dynamics among women and men, youth and the elderly, people with diverse abilities, and various ethnic or social groups. Also, since a household's vulnerability is influenced by its capacity to recover from shocks, it cannot be separated from resilience. These concepts are closely interconnected (Feeny et al., 2013, p. 1). The vulnerability focuses on socioeconomic status changes of individuals, while poverty relates to their current socioeconomic status. The literature on vulnerability and poverty primarily highlights groups that are already impoverished and more susceptible to declines in their socioeconomic status below the mean (Glewwe and Hall, 1998, p. 182).

The definition of financial fragility measures not only the current status of poverty but also future financial risk. The vulnerability measure serves as an early indicator of future financial difficulties, demonstrating that it captures households currently positioned above the poverty line but whose financial condition suggests a high likelihood of experiencing economic and financial challenges in the near term. In other words, vulnerability stems from a household's lack of sufficient liquid assets (cash) (Brunetti, Giarda, and Torricelli, 2016, p. 20). These findings indicate that financial fragility acts as a precursor, heightening vulnerability to poverty. Dushku (2023) applied the methodology of Lusardi et al. (2011) to evaluate whether households can meet unexpected expenses up to the international poverty line. This approach directly addresses financial vulnerability, potentially allowing for a lower poverty line.

The financial fragility of households is determined by various sociodemographic and economic indicators that influence individuals' and families' resilience to economic shocks. Previous studies will be examined to identify which variables impact financial fragility. In the existing literature, the income level, borrowing tendencies, saving habits, and demographic variables stand out as the key determinants of the household financial fragility (Yusof, Rokis, and Jusoh, 2015; Anderloni et al., 2012; Hasler and Lusardi, 2019; Lusardi et al., 2011; Daud, Marzuki, Ahmad, and Kefeli, 2019; Dushku, 2023). Analysing household financial fragility is important for developing policies that enhance households' financial resilience and stability.

This paper explores the relationship between households' financial fragility and socioeconomic and demographic determinants in Türkiye. Specifically, this study investigates the factors that determine household financial fragility in Türkiye by measuring households' ability to cope with unexpected spending shocks. The existing literature indicates a lack of assessments regarding household financial fragility in Türkiye. Therefore, this study focuses on filling this gap by exploring the relationship between sociodemographic and economic factors and the likelihood of households experiencing financial instability. The paper is organised so that the second chapter covers the literature on financial fragility, while the third chapter includes the methodology and data. The fourth chapter presents the empirical results derived from the logistic model, while the fifth chapter provides an in-depth discussion of these findings.

## 2. Theoretical background of household financial fragility

The notion of household financial fragility is naturally complex and contains multiple dimensions. Households' financial fragility is a dynamic concept shaped by individuals' financial decisions and broader economic conditions, which involves both individual behaviours and external factors. In other words, to effectively measure households' financial fragility, it is essential to consider not only their assets but also their financial behaviours and decision-making patterns (Hasler and Lusardi, 2019; Dushku, 2023, p. 11; Lusardi et al., 2011).

Lusardi et al. (2011) introduced the concept of financial fragility, defined as a household's ability to withstand an unexpected financial shock. The measure offered by Lusardi et al. (2011) is unique because it not only evaluates the levels of assets and liabilities but also assesses households' capacity to manage financial shocks effectively. Their research analysed the capacity of American households to manage financial emergencies, based on data from the 2009 TNS Global Economic Crisis Survey (GECS). The study specifically evaluated household financial fragility by assessing their ability to gather $2,000 within 30 days.

Based on the related literature regarding the factors influencing household financial fragility, it is evident that individuals' economic and sociodemographic characteristics play a significant role in their financial fragility. In this context, sociodemographic factors like marital status, age, gender, and educational level are considered critical determinants. Jamaluddin, Zakaria, and Satar (2024) describe the indicators that determine the financial fragility of a household in their work, as shown in Figure 1. Jamaluddin et al. (2024) assess the issue of household overindebtedness and financial fragility in the context of the financial challenges faced by Malaysian civil servants. According to Jamaluddin et al.'s (2024) study, the framework for evaluating a household's financial fragility incorporates various demographic variables, including marital status, age, educational level, gender and number of dependents. Furthermore, the household's income, overindebtedness, and materialistic values determine its financial fragility. This multidimensional framework helps understand the various factors that influence household financial fragility.
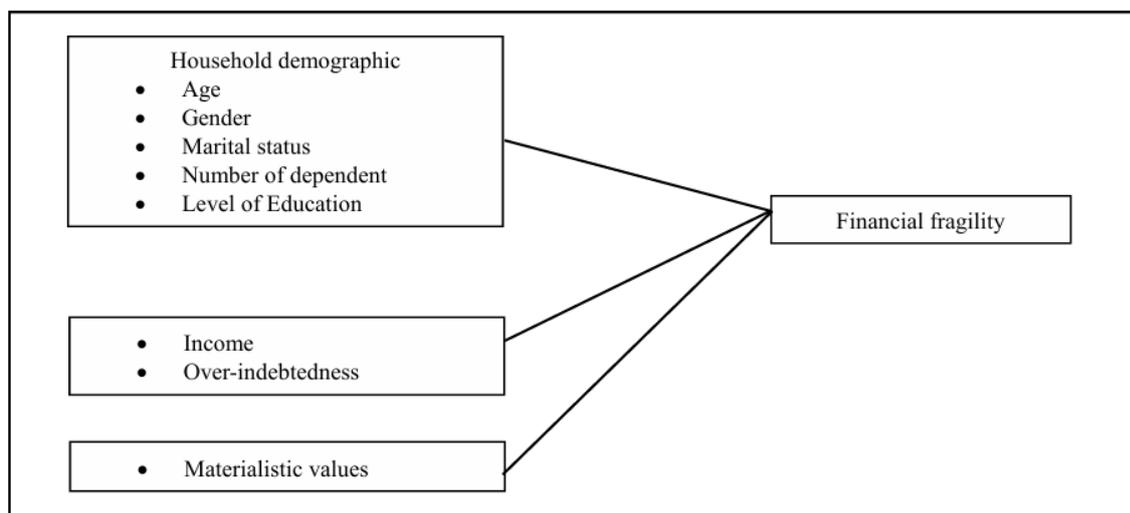


*Figure 1:* Conceptual framework of the household financial fragility. (Source: Jamaluddin et al., 2024, p. 39).

Many studies in the literature for different countries also emphasise that economic and sociodemographic determinants play a significant role in determining household financial fragility. Studies on household financial fragility gained considerable momentum, particularly following the 2007-2009 Financial Crisis. Pioneering studies in this area generally focused on the United States (US). The concept of financial fragility and its core definition were largely introduced to the academic literature by the study conducted by Lusardi et al. (2011), which utilised the TNS GECS. Lusardi et al. (2011) showed that education, cognitive ability, ethnicity and age are influencers of financial fragility. According to their findings, individuals with lower financial literacy and education, families with children, the unemployed, and those who had experienced major wealth losses were more financially fragile. Additionally, individuals in the middle class also perceived themselves as financially fragile. They emphasised that, while financial fragility was more apparent among young individuals, many individuals in elderly age groups also reported struggling to cope with a financial shock. Another study conducted in the United States was analysed by Hasler and Lusardi (2019). They examined the factors impacting the financial vulnerability of middle-income American households. Utilising data from the 2015 National Financial Capability Study (NFCS), the authors analysed the balance sheets and socioeconomic characteristics of households, focusing on their expenditures and debt handling. Their

findings indicated that financial fragility in middle-income households was mainly affected by household size, high debt burdens, and low financial literacy. Larger families must spread their financial resources further, while households with higher incomes tend also to carry more debt and are highly leveraged. These households often use expensive borrowing methods in emergencies. A deficiency in financial literacy increases the difficulty of managing the mix of assets and debts. This fragility has lasting effects, such as a reduced likelihood of retirement planning. Similarly, the study conducted by Clark, Lusardi, and Mitchell (2020) examined the financial fragility of individuals aged 45-75 in the US during the first months of the COVID-19 pandemic and found that approximately one-fifth (18.9%) of households were financially fragile and unable to meet an unexpected emergency expense of $2,000 within a month. The study revealed that demographic and economic variables such as age, ethnicity, household size, marital status, education, and income, as well as financial literacy, are significant determinants of financial fragility.

In this context, another significant study is that of Christelis, Jappelli, Paccagnella, and Weber (2009), which examined the financial fragility of the elderly population in Europe. This paper provided insights into how this fragility differs across various countries, health statuses, age, and other socioeconomic factors. The accumulation of debt, the availability of collateral, the time to maturity, and the ratio of instalment payments to disposable income indicate aspects of the financial fragility of a household. Also, Demertzis et al. (2020) emphasised that financial fragility in Europe was a structural issue even before the COVID-19 pandemic. It revealed that one in three households in the European Union (EU) lacked the capacity to cope with such an unforeseen expenditure. According to the findings of the study, having a dependent child, being in a single-parent household, and being a single woman are the main factors contributing to financial fragility in the EU. Along the same lines, Šubová, Mura and Buleca (2021) investigated the determinants of household financial vulnerability using the Household Finance and Consumption Survey micro-dataset collected by the European Central Bank in the EU countries for three waves (2010/early 2011, 2014 and 2017). According to the research findings, in all three waves, the value of wealth, the number of elderly individuals and the existence of mortgage interest tax statistically significantly affected the fragility. Additionally, an increase in the number of elderly individuals who are over 65 years old in the household, a rise in total wealth, the availability of liquid financial assets, a higher level of education, and a higher number of employed individuals in the household increased the resilience of households to financial shocks, statistically significantly reducing their fragility. Conversely, an increase in the number of dependent children and the rise in the value of real assets, which are generally financed with mortgage debt, were identified as key factors that increase the debt servicing burden on households, thereby triggering financial fragility.

Anderloni et al. (2012), in their study on Italy, concluded that more educated individuals may be more successful in generating income and managing a budget, and that fragility decreases as the duration of education increases. In addition to education, wealth, high monthly income levels, and having an insurance policy reduce financial vulnerability. Also, they emphasised that consumers who act impulsively tend to be more financially fragile. According to the study's findings, being separated, having more children, renting, and adverse shocks increased financial vulnerability. Additionally, Brunetti et al. (2016) conducted a study in Italy that revealed socioeconomic factors such as low income, low wealth, low education, unemployment, and a divorced, widowed, or single household head increase the likelihood of fragility. However, male-headed households were found to be less prone to financial fragility.

Cziriak (2022) analysed German households' ability to deal with unexpected expenditures during the second term of the COVID-19 pandemic by addressing their financial vulnerability. Participants were questioned about their ability to cover an unexpected expenditure of €2,000 within a month. The study found that approximately one-third of German households stated being unable to cover an unexpected expenditure of €2,000 within a month. Socioeconomic groups at higher risk of financial vulnerability included individuals with children, renters, the unemployed or those marginally employed, and people with low income, wealth, or education levels. Furthermore, a greater number of significant income losses since the start of the crisis was associated with a greater likelihood that households would struggle to cover unexpected expenditures. However, financial literacy was ascertained to be

significantly inversely related to financial vulnerability and helped mitigate the negative consequences of income losses.

Kowalczyk-Rólczyńska and Rólczyński (2020) carried out a study on Central and Eastern European countries utilising EU-SILC Eurostat household data from 2018. The selected countries were Croatia, Poland, Hungary, and Romania. The study aimed to assess the factors influencing a household's capacity to manage sudden costs and to analyse their impact. In this context, common factors determining financial vulnerability for these countries are total disposable household income, bill arrears, the ability to afford a one-week yearly holiday away from home, tenure status, dwelling type, and the total financial burden of housing costs.

Albacete and Lindner (2013) conducted a study to examine household debt and fragility in Austria. Their study assessed the potential risks to financial stability from the perspective of the banking sector and examined the characteristics of indebted households. According to their findings, low income, low wealth, living in a single-person household, renting, and unemployment increase household vulnerability. Furthermore, vulnerability was notably high among households with domestic currency debt, non-mortgage debt, and fixed-rate mortgage debt.

He and Zhou (2022) analysed the financial vulnerability of rural and urban households in China and identified its determinants. According to the study's findings, household financial vulnerability is higher in rural areas compared to urban areas. Furthermore, demographic factors such as the household head's education level, household size, and labour force participation, as well as disability and severe health shocks, are identified as the most important determinants of financial vulnerability.

In their study on Malaysia, Daud et al. (2019) adapted Anderloni et al.'s (2012) concept of financial vulnerability, defining it as the failure to cover household expenditures, handle unforeseen expenditures, or withstand financial shocks. In line with this definition, financial fragility was evaluated using the Financial Vulnerability Index (FVI), which measures consumers' ability to cover household needs, handle unexpected expenditures, and manage during times of crisis. The analysis found that age, marital status, education level, financial behaviours, and income level related to money management were among the important determinants of financial fragility. It was concluded that the most financially fragile were generally younger individuals, those with low educational levels, and those who exhibited financial behaviours that led to ineffective financial management.

Yusof et al. (2015) explored the capacity of households in urban areas of Malaysia to manage financial shocks and the various factors contributing to financial fragility. In the study, participants were asked about unexpected situations that could hinder their ability to meet household living expenditures. This aimed to understand households' financial vulnerabilities and identify the types of shocks to which they are most susceptible. The study reveals that households in urban areas face financial fragility. According to results, more than 20 per cent of households cannot make ends meet for at least three months in the event of an income cut, while just 10 per cent are resilient to shocks such as physical disability, unemployment, divorce, death or fluctuations in stock markets and interest rates. Also, over 20 per cent of these households lack sufficient savings or alternative sources to raise Ringgit Malaysia (RM) 10,000 when needed. It is emphasised that household income is an important determinant of financial stability, and it indicates that households possessing financial literacy and higher education are less likely to experience asset poverty.

## 3. Data and methodology

This study uses the microdata drawn from the "Life in Transition Survey (LiTS) IV", which was conducted by the World Bank [WB] and the European Bank for Reconstruction and Development [EBRD] in 2022-2023. LiTS IV was completed in 37 economies by interviewing over 37,000 households (EBRD, 2023). The dependent and independent variables utilised in the study were selected based on the related literature review and systematically revised for compatibility with the logistic regression analysis.

There are various measurement methods for household financial fragility. This study assesses households' financial fragility using the methods developed by Lusardi et al. (2011), Brunetti et al. (2016), and Dushku (2023). A household's confidence in its ability to handle unforeseen expenses is

considered a significant indicator of financial fragility. This implies the adequacy of household income and savings levels to meet sudden and unplanned expenses. The methods used to assess financial fragility involve survey questions that evaluate individuals' ability to afford essential expenditures. This approach provides significant knowledge about financial stability within the population.

The question is "Imagine that you have an emergency which needed you to pay [1/20 of GNI per capita in local currency] (around XX euro). The following LiTS IV question was used as the dependent variable in the study to measure household financial fragility "Would you be able to come up with [1/20 of GNI per capita in local currency] (around XX euro) within the next month or not?". This question has two answers: "Yes, would be able to" and "No, would not be able to".

In the study, the answer "Yes, would be able to" indicates that the household can cover unexpected expenditures using its own resources, whereas a response of "No, would not be able to" indicates that it cannot. In this case, our dependent variable represents individuals' ability or inability to meet these emergency expenditures. Given that the dependent variable is discrete and can take on two values. The most commonly applied regression technique for analysing these data is the logistic regression model. Also, logistic regression is the most widely used method for estimating the relationship between a set of independent variables (x) and a dependent variable (Y). In this model, the conditional mean of Y given x is expressed as $\pi(x) = E(Y|\text{x})$, and the specific form of the model is shown in Equation 1.

$$\pi = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}} \tag{1}$$

The logit transformation of the probability π(x), which is central to the model, represented by g(x), allows us to express it in a linear form.

$$g(x) = \ln\left[\frac{\pi(x)}{1 - \pi(x)}\right] = \beta_0 + \beta_{1x} \tag{2}$$

(g(x)), used as a logit, has many desirable properties of a linear regression model because it is linear in parameters and can vary between $-\infty$ and $+\infty$ (Hosmer, Lemeshow, and Sturdivant, 2013, pp. 1-7).

This linear relationship, established by the logistic transformation, provides a theoretical framework for estimating coefficients. In this analysis, the model expresses Y as the likelihood of household financial fragility and X as the independent predictors. The binary logistic regression model formulated for this analysis is as follows:

$$\ln\left(\frac{\pi(X)}{1 - \pi(X)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k \tag{3}$$

$\pi(x)$ denotes the probability of household financial fragility, and $\beta_0$ is a constant term. $X_i$ represents the independent variables, which are age, gender, borrowing ability, education level, household size, marital status, presence of an elder person requiring care, home ownership status, current financial situation, employment status and household income. These independent variables are selected from the existing literature on household financial fragility.

Table 1 displays the dependent and independent variables incorporated in the model. The dependent variable is defined as the individual's capacity to pay an amount equivalent to 5 per cent of the GNI per capita (in local currency) in the following month, given an emergency and the variable "emergency_exp" indicates the dependent variable in Table 1. Individuals who cannot make payments reflect that they are financially fragile. The explanatory variables in the study consist of continuous and categorical variables. The explanatory variables are gender, age, education level, household size, the presence of an elderly member requiring care, marital status, home ownership status, employment status, borrowing money, income and the financial situation of the household.

The gender variable is categorised as female and male. Age is categorised in six groups, which are "age18_24, age25_34, age35_44, age45_54, age55_64 and age≥65 years". The age 18-24 group is selected as the reference category. In the literature, education level has been used as a significant explanatory variable in many studies (Lusardi et al.,2011; Brunetti et al., 2016). Therefore, individuals

with no educational qualifications and those with primary level education are classified as "primary or less". Furthermore, individuals with lower and upper secondary education are classified as "secondary". Those with tertiary education, including tertiary education (not a university diploma), post-secondary non-tertiary education level, bachelor's degree or more, and also PhD degree or master's degree, are classified as "tertiary". The reference category is individuals who have a tertiary education. Household size is divided into two categories. The first category includes households with fewer than or equal to the mean number of members. The second category includes households with more than the mean number of members. The households with fewer than or equal to the mean number of members are used as the reference category for analysis. The presence of an elderly family member who requires care within the household is another factor influencing financial fragility. The "elder" variable indicates whether there are elderly members requiring care in the household or not. The absence of elderly members requiring care is selected as the reference category. The variable "married" indicates an individual's marital status. The reference category comprises individuals who are unmarried, defined as single, separated, or widowed. The home ownership status indicates whether a household member owns or rents the dwelling. The reference category implies that none of the household members owns the dwelling. The "employment" variable is an indicator of employment status, indicating whether an individual is employed. The employment variable is generated based on the responses to the survey question, "Have you ever worked or are you currently working?". Unemployment is selected as the reference category. The "borrow_money" variable indicates whether individuals have borrowed money from a bank or a formal financial institution, either alone or with someone else, in the last twelve months. The reference variable is the individuals' non-borrowing status. The "Current financial situation" variable describes a household's current financial status. To show its impact clearly, it is divided into eight categories. The reference group includes people in debt. The "financial situation over 40" means a household can save more than 40% of its household income, and the "financial situation 20_40" means they can save between 20% and 40%. The "financial situation 10_20" indicates that a household can save its income between 10% and 20%, and the "financial situation 5_10" indicates that they can save 5% to 10%. The "financial situation less 5" means they save less than 5% of their household income. The "financial situation meets" describes households that are just getting by and cannot save. The "financial situation draws savings" refers to households that must use their savings. The "financialsituationdebt" refers to the situation in which the household is in debt and is the reference category for the current financial situation variable. While all of these variables are discrete variables, the income variable in this study is continuous. The income variable is included in the analysis by taking its natural logarithm. It represents the income of each individual in the household.

Table 1

*Descriptive statistics*

| Continuous Variable | N | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| lnincome | 942 | 9.131 | 1.237 | 2.303 | 12.206 |
| Categorical Variables (%) | | | | Frequencies | Percent |
| Emergency_exp | | | | | |
| Yes | | | | 514 | 47.46 |
| No | | | | 569 | 52.54 |
| Gender (Reference: Male) | | | | | |
| Female | | | | 557 | 50.23 |
| Male | | | | 552 | 49.77 |
| Age (Reference: age18-24) | | | | | |
| age18_24 | | | | 161 | 14.52 |
| age24_34 | | | | 333 | 30.03 |
| age35_44 | | | | 233 | 21.01 |
| age45_54 | | | | 171 | 15.42 |
| age55_64 | | | | 131 | 11.81 |
| age≥ 65 | | | | 80 | 7.21 |
| Education Level (Reference: Tertiary education) | | | | | |
| Primaryorless education | | | | 328 | 29.58 |
| Secondary education | | | | 514 | 46.35 |

| | | |
|---|---|---|
| Tertiary education | 267 | 24.08 |
| Employment Status (Reference: Not employed) | | |
| Employed | 613 | 55.28 |
| Not employed | 496 | 44.72 |
| Household Size (Reference: hhouldsizeundermean) | | |
| hhouldsizeundermean | 690 | 62.22 |
| hhouldsizeovermean | 419 | 37.78 |
| Elder (reference: No) | | |
| Yes | 64 | 5.77 |
| No | 1,045 | 94.23 |
| Marital Status (reference: notmarried) | | |
| Married | 716 | 64.52 |
| Not married | 392 | 35.38 |
| Home Ownership Status (reference: No) | | |
| Yes | 695 | 62.67 |
| No | 414 | 37.33 |
| Borrow money (reference: No) | | |
| Yes | 293 | 26.73 |
| No | 803 | 73.27 |
| Current financial Situation (Reference: financialsituationdebt) | | |
| financialsituationover40 | 37 | 3.34 |
| financialsituation20_40 | 52 | 4.69 |
| financialsituation10_20 | 80 | 7.21 |
| financialsituation5_10 | 105 | 9.47 |
| financialsituationless5 | 118 | 10.64 |
| financialsituationmeets | 487 | 43.91 |
| financialsituationdrawsavings | 62 | 5.59 |
| financialsituationdebt | 142 | 12.80 |

Source: Authors' calculation

## 4. Estimation results

Multicollinearity refers to a high degree of correlation between explanatory variables. This study evaluates multicollinearity through the variance inflation factor (VIF) metric. Multicollinearity is present if VIF values are 10 or greater (Doti, Biyena, and Edesa, 2021, p.159). However, the average VIF value in this study was 1.61, which is less than 10, indicating that there is no serious multicollinearity problem.

Table 2

*Estimation results*

| emergency_exp | Coef. | Odds Ratios |
|---|---|---|
| female | .212 | 1.236 |
| | (.159) | (.196) |
| primaryorless | .412* | 1.51* |
| | (.237) | (.359) |
| secondary | .389* | 1.476* |
| | (.201) | (.296) |
| age25_34 | -.452* | .636* |
| | (.260) | (.165) |
| age35_44 | -.376 | .687 |
| | (.274) | (.188) |
| age45_54 | -.012 | .988 |
| | (.289) | (.286) |
| age55_64 | -.073 | .93 |
| | (.322) | (.299) |
| age≥ 65 | -.203 | .816 |
| | (.346) | (.282) |

| | | |
|---|---|---|
| elder | .616* | 1.851* |
| | (.327) | (.605) |
| employment | -.525*** | .591*** |
| | (.164) | (.097) |
| borrow_money | -.48*** | .619*** |
| | (.168) | (.104) |
| hhouldsizeovermean | -.093 | .911 |
| | (.169) | (.154) |
| financialsituationover40 | -3.535*** | .029*** |
| | (.778) | (.023) |
| financialsituation20_40 | -2.658*** | .07*** |
| | (.553) | (.039) |
| financialsituation10_20 | -1.527*** | .217*** |
| | (.36) | (.078) |
| financialsituation5_10 | -1.525*** | .218*** |
| | (.342) | (.074) |
| financialsituation5 | -1.855*** | .157*** |
| | (.363) | (.057) |
| financialsituationendsmeets | -.814*** | .443*** |
| | (.251) | (.111) |
| financialsituationdrawsavings | .022 | 1.023 |
| | (.412) | (.422) |
| home_ownership | -.367** | .693** |
| | (.164) | (.114) |
| married | -.302* | .74* |
| | (.170) | (.126) |
| lnincome | -.381*** | .683*** |
| | (.090) | (.062) |

Notes: (1) Standard errors are indicated in parentheses. (2) *** p<.01, ** p<.05, * p<.1
Source: Authors' calculation

The model's estimation results, including coefficients and odds ratios, are presented in Table 2. Individuals with secondary education, no education, and primary education are more likely to be unable to pay emergency expenses than those with higher education. In other words, individuals with primary or lower levels of education are 1.51 times more likely to be financially fragile than those with tertiary education. Similarly, individuals with secondary education levels are 1.48 times more financially fragile than the reference group.

According to the coefficients, the 25–34 age group has a significant impact on the ability to pay for emergency expenditures. The reference group is age18_24 for the age groups. Individuals aged 25_34 are 0.64 times less likely to be financially fragile than those in the 18-24 age group. On the other hand, having an elderly family member requiring care in the household increases the risk of financial fragility. Their presence increases the likelihood of households being unable to pay for emergency expenses. Households with elderly members requiring care are 1.86 times more financially fragile than those without. Also, employment status significantly influences financial fragility. The "employment" variable indicates that if an individual is currently employed. The reference group is unemployed individuals. Therefore, being employed reduces the likelihood of being unable to pay emergency expenses when compared to being unemployed. Employed individuals are 0.59 times less financially fragile than unemployed individuals. In addition to being employed, the results indicate that borrowing money from a bank or other formal financial institutions, either alone or with someone else, in the last twelve months, reduces the likelihood of being unable to pay emergency expenses. In other words, individuals who borrow are 0.61 times less financially vulnerable than those who do not borrow. Therefore, individuals who do not borrow are more likely to be financially fragile.

According to Table 2, individuals' current financial situation significantly affects determining their financial fragility. The ability to save more than 40% of household income substantially decreases the probability of being unable to cover emergency expenditures. Similarly, individuals who can save

between 20% to 40%, or 10% to 20% of their household income, are also in a stronger position to meet emergency expenditures compared to those who are in debt. Also, individuals who can only make ends meet or save less than 5% of their household income are more financially resilient than those living in debt. The analysis shows that individuals who can save and those who can barely make ends meet on their household income are more likely to meet an emergency pay than individuals who are in debt. In other words, individuals who can live on their household income and save are more resilient to financial shocks than those in debt. Conversely, individuals in debt are more financially fragile. The results display that home ownership has a significant influence on financial fragility. The reference category consists of individuals who do not own homes. This means homeowners are less financially fragile than non-homeowners. Specifically, they are about 0.69 times as likely as non-homeowners to be unable to cover emergency expenditures.

The findings show that marital status significantly affects financial fragility. The reference group is unmarried individuals. Married individuals are less financially fragile than unmarried individuals. Specifically, married individuals have 0.74 times the likelihood of being financially fragile as unmarried individuals. This indicates that unmarried individuals tend to be more financially fragile. The analysis reveals that income significantly affects financial fragility. Individuals who have higher incomes face a reduced risk of financial fragility than those with lower incomes. Specifically, a one-unit increase in the logarithmic scale of household income reduces the odds of being unable to pay for emergency expenses by approximately 0.68 times. In other words, as income rises, the likelihood of financial fragility decreases. Consequently, households with low income are more financially vulnerable than those with high income.

## 5. Conclusion

This study aimed to examine the determinants of households' financial fragility in Türkiye, positioning fragility as a crucial indicator of both household economic well-being and poverty. A binary logistic regression model is estimated in this study using the LiTS IV dataset. Logistic regression has been preferred because it allows examining the relationships between various explanatory variables with different measurement types and a binary explained variable.

The results consistently reveal that household financial fragility depends on fundamental socioeconomic factors. The analysis demonstrates that household income is the strongest driver of household financial fragility. For each additional unit of a household's income, a household's chance of financial fragility decreases. This means that individuals who have low incomes are more prone to financial fragility than those with high incomes. This finding is consistent with the previous studies conducted for different countries, such as Clark et al. (2020), Lusardi et al. (2011), Dushku (2023), Hasler and Lusardi (2019), and Jamaluddin et al. (2024). Education also plays a significant role. Compared to highly educated individuals, individuals without an education level and with a primary education level are more likely to be financially fragile. In addition, individuals with a secondary education level are more likely to experience financial fragility than individuals with a tertiary education level. The results are supported by Lusardi et al. (2011), Albacete and Lindner (2013), Hasler and Lusardi (2019), Cziriak (2022), He and Zhou (2022), Dushku (2023), and Šubová et al. (2021).

The study results show that individuals aged 25-34 are less likely to be financially fragile than those aged 18-24. Lusardi et al. (2011) demonstrated that financial fragility is more common among younger individuals. Another factor affecting a household's financial fragility is the presence of an elderly family member in need of care. The study's results show that having an elderly person in need of care within a household increases the likelihood of experiencing financial fragility.

According to the study's results, another factor affecting financial vulnerability is that individuals are married. The study's results demonstrate that married individuals are less likely to experience financial fragility than their unmarried counterparts, such as singles, widows, divorced and separated individuals. Being married increases financial resilience due to the advantages of a dual income and mutual support mechanisms. Brunetti et al. (2016), Anderloni et al. (2012), Hasler and Lusardi (2019) and Dushku (2023) indicated that being married reduces the likelihood of financial fragility. It's clear that, in addition to income, individuals' employment status, borrowing habits, and

overall financial situation also play a significant role in household financial fragility. Employed individuals tend to be more financially resilient than unemployed individuals, reducing their likelihood of struggling to meet unforeseen expenditures. These findings are also supported by Hasler and Lusardi (2011), Albacete and Lindner (2013), Cziriak (2022), Clark et al. (2020), Dushku (2023), and Anderloni et al. (2012). Additionally, borrowing has been found to decrease the likelihood of being unable to cover emergency expenditures. Studies by Clark et al. (2020) and Lusardi et al. (2011) reveal that borrowing from friends and family, formal credit, and even alternative credit are frequently used to cope with unexpected expenditures. The financial situation of household members also appears to play a role in determining financial fragility. Households that save a portion of their income are more resilient to financial shocks, while those with debt are more vulnerable. Even individuals who save less than 5% of their income and are barely making ends meet are more resilient than those with debt. This suggests that debt aversion is a key indicator of financial resilience. This finding aligns with studies by Anderloni et al. (2012), Hasler and Lusardi (2019), Cziriak (2022), and Lusardi et al. (2011). The results confirm the expected relationship between home ownership and financial fragility, with homeowners exhibiting greater resilience to financial shocks. This finding is consistent with the studies of Albacete and Lindner (2013), Cziriak (2022) and Dushku (2023). In conclusion, the factors determining the financial fragility of the household in the study are found to be the household's educational level, age, the presence of elderly people in need of care at home, individuals using credit, working individuals, married individuals, owning a house and not having debt, and income level.

This study's results provide some critical policy insights and implications. The findings indicate that financial fragility is not merely a short-term liquidity problem but stems from underlying structural poverty and inequality. This study, therefore, positions financial fragility as an important indicator of hidden poverty. It identifies households whose current financial situation is just above the poverty line but who are structurally vulnerable to falling into chronic distress following a subsequent shock. In other words, given that financial vulnerability measures not only current poverty status but also future financial risk, our findings suggest that financial vulnerability acts as a pioneer, actively increasing the risk of falling into poverty. Addressing fragility is a key component of poverty reduction strategies. Therefore, structural policies aimed at reducing poverty should be the main priority when developing policies to strengthen individuals' financial resilience. Developing policies that enhance educational attainment and increase employment opportunities is essential for mitigating the impact of financial shocks. Policymakers should prioritise improving individuals' current financial situation, income stability, and social support mechanisms to increase their financial resilience. Also, implementing policies that make home ownership more accessible will increase individuals' financial resilience.

The analysis comprehensively demonstrates how both economic and sociodemographic factors influence resilience. However, the study has potential limitations due to its use of cross-sectional data and its reliance on subjectively reported financial data from individuals. Future research should prioritise the use of longitudinal or panel datasets to yield a more extensive insight into financial shocks and household resilience.

## Author statement

### Declaration of research and publication ethics

This study has been prepared in accordance with the ethical principles of scientific research and publication.

### Approval of ethics board

Ethics committee approval is not required for this study.

### Author contribution

The author is solely responsible for all parts of the study.

### Conflict of interest

There is no conflict of interest between any organization or individual.

### Declaration of support

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