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Measuring economic insecurity with a joint income-wealth approach

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Abstract

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Keyword: income, wealth, economic insecurity, objective risk, PSID

JEL Cassification: D63, I39

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Abstract

In this paper, we propose the use of a joint income and wealth distribution to measure economic insecurity. Our main purpose is to study its dimension and identify its main drivers in developed countries overcoming the dichotomy between income and wealth. To this end, we approximate an extended well-being measure that includes monetary resources from income and the potential stream from wealth, which can be understood as an emergency reserve to cope with future economic difficulties but could also be a source of financial distress due to fluctuations in asset holdings and prices. We find that economic insecurity levels are larger when considering our extended well-being variable than income alone. Household income and non-liquid assets appear to be the main drivers of economic insecurity, although part of US population was able to obtain higher returns on non-liquid assets and maintain their income levels.

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1. Introduction

There is a general feeling that good times are over and economic progress for low and middle classes is almost depleted. Recent trends in globalization, technological advances and changes in work organization have improved the living conditions of some population groups but have also brought to light the fragile situation of the vast majority, who face increasing risk and uncertainty (Hacker, 2020; United Nations, 2020).

It is only in recent years that social and economic researchers have become aware of the importance of economic insecurity, especially in the wake of the Great Recession. Many people suffered from negative financial shocks (huge income losses, an increase in unemployment risk and a rise in household debt among other economic distresses), which led to a deterioration of future economic prospects. In other words, people worried more about financial shocks in later periods and the impossibility to overcome their negative consequences, that is, they became more economically insecure (Hacker, 2018). These high levels of insecurity do not seem to have improved much with the recovery of the economic activity but have been maintained due to growing labour precariousness and the transfer of risk from public institutions and corporations to individuals (Hacker, 2019). More recently, the COVID-19 pandemic has led to a larger unpredictability of future states and growing feelings of fear (Clyne and Smith, 2021).

Economic insecurity reveals itself as one of the greatest challenges of modern societies together with poverty and inequality. A larger exposure to economic risks will increase the anxiety that people feel about future financial situation, reducing their quality of life in the present and influencing their economic behaviour. Individuals will be less prone to engage in risk-taking activities and the negative effects of their decisions could also transcend to the macroeconomic level. Among its multiple effects, economic insecurity may impact consumption and housing investment (Benito, 2006); human capital acquisition (Stiglitz, Sen and Fitoussi, 2009); job mobility (McGuinness and Wooden, 2009; Swaen et al., 2002); fertility (Fiori et al., 2013; Mansour, 2018; Modena, Rondinelli and Sabatini, 2014); physical and mental health (Rohde, Tang and Osberg, 2017; Rohde et al., 2016; Smith, Stoddard and Barnes, 2009; Staudigel, 2016; Watson, 2018), and even political participation and voting decisions (Bossert et al., 2022).

In this context, an ideal measure of economic insecurity should capture three fundamental elements: the probability of an unfortunate future event, a negative economic consequence in case this event takes place and the absence of protection to cope with distress (Hacker, 2018). This reference to future economic hazards poses serious difficulties in designing indicators to assess this phenomenon. Even though some attempts have been made, the literature has not yet agreed on a standard method to compute insecurity and further effort is required to understand this phenomenon in order to guide public policy. Thus, if policy makers are able to anticipate individuals' future economic risks, they could more effectively design targeted ex-ante interventions to prevent declines in household well-being. This strategy represents an advantage over ex-post action against inequality and poverty when well-being losses have already materialised.

One of the main issues when designing an insecurity indicator is the selection of variables or dimensions. There have been several proposals to assess the exposure to objective economic risk with standard variables traditionally used in the measurement of poverty and inequality, such as income or wealth. The consideration of these variables allows for the comparison of insecurity with other low well-being phenomena in a more homogeneous manner. For instance, Rohde, Tang and Rao (2014) approximate insecurity as downward income instability, whereas Watson (2018) uses the predicted individual probability of experiencing a large income loss. Conversely, Bossert and D'Ambrosio (2013) believe that wealth is a more adequate variable to assess economic insecurity as it can be understood as an emergency buffer stock: in case an adverse event materialises, current wealth can be turned to an income flow to mitigate the negative consequences of distress. With an integrated approach, Hacker et al. (2010, 2014) measure economic insecurity as the percentage of individuals who experience a large drop in their household income from one year to the next and lack enough liquid financial wealth to cope with that loss.

While income and wealth may be equally valid to measure economic insecurity from a theoretical perspective, empirical analyses reveal that results are highly conditioned to the dimension selected. Using information on changes in household wealth, D'Ambrosio and Rohde (2014) find that US households have more economic security than those in Italy due to a larger accumulation of financial assets. On the contrary, Rohde, Tang and Rao (2014) find that economic insecurity (measured as downward income instability) is the highest in the United States (US) when considering post-government incomes. These results evince that the use of a single dimension limits the correct measurement of economic insecurity and cannot fully capture the diverse aspects in which this phenomenon is manifested (Rohde, Tang and Osberg, 2017; Romaguera-de-la-Cruz, 2020). On the one hand, income can be used as an indicator of living standards and represents the monetary flow of resources obtained by an individual or household at a given time and which are readily available. Wealth, on the other hand, corresponds to the accumulation of resources over a person's lifetime and captures the permanent component of well-being: it could be transformed into a flow of resources if needed (acting as a buffer stock), but it could also be a source of financial distress due to fluctuations in asset holdings and prices. Hence, the consideration of a joint measure of income and wealth brings us closer to assessing economic insecurity to its full extent: it combines the liquidity scope of income with the future realization of wealth, providing the best predictor of all annual consumption possibilities to cope with unfortunate events.

The purpose of this paper is twofold. First, we aim to disentangle the dichotomy between income and wealth when assessing economic insecurity. Therefore, we follow Weisbrod and Hansen (1968) to generate a measure of extended well-being (hereafter EW) by converting current wealth stock into a flow which is added to pre-tax income in a given period. We then approximate economic insecurity as the probability of experiencing short-term losses in this EW and analyse whether the evolution and distribution of this phenomenon in the US over the last two decades are robust to the selection of different variables. Thus, we are able to produce a forward-looking measure of insecurity that reflects the objective risk of individuals and captures the probability of future large decreases in all their available resources. To the best of our knowledge this is the first attempt to assess economic insecurity with a joint distribution of income and wealth. Secondly, we study the possible drivers of economic insecurity by comparing the evolution of various components of EW for those individuals above and below the average level of insecurity in our period of analysis. To this end, we estimate changes in the probability of owning a given type of asset (composition effect) as well as changes in the value of this EW components (price effect) through fixed effects estimates for each group which allow us to control for unobserved heterogeneity.

Our results show that levels of economic insecurity are not robust to the dimension selected for its calculation. Thus, from 2001 to 2019, the average probability of suffering EW losses in the US was 33%, whereas this percentage reduces to 22% when income is considered and increases to 43% when we take into account only wealth. Large variations in asset prices could explain the greater economic insecurity in wealth. Hence, the inclusion of the flow from wealth to household income increases the probability of EW losses compared to the income-based results. In addition, the evolution of economic insecurity also changes depending on the dimension selected. During the expansionary period preceding the 2008 financial crisis, there was a general decline in economic insecurity when estimations are based on income or wealth but if we consider EW no significant changes are observable. In contrast, during the Great Recession economic insecurity grew regardless of the variable used to measure it. Moreover, the turn in the economic cycle after 2011 led to an overall decrease in insecurity until 2019, although the EW measure showed a more volatile evolution. Furthermore, we find that the sharp decline in household incomes and the fall in the flow of non-liquid assets (real estate, business assets, and pension assets) following the Great Recession were the main drivers of the higher probability of well-being losses for part of the US population, while those theoretically less exposed to risk were able to obtain higher returns on non-liquid assets and did not suffer household income losses.

The paper is structured as follows: the next section reviews the preceding literature on economic insecurity indices. Section 3 sets out the methodology of the paper: how to transform income and wealth into a single variable, the calculation of the economic insecurity measures, the econometric strategy chosen to analyse economic insecurity drivers and which data are used for the empirical illustration. Section 4 presents our main results, while Section 5 gathers our main conclusions.

2. Literature review

Despite the interest in the study of economic insecurity and its impact on several well-being dimensions, no general agreement has yet been reached on its definition and calculation. Each article in the literature starts from an ad-hoc definition of insecurity, even though most of them include the following key elements: (1) an exposure to financial distress which could have not yet materialised; (2) future economic losses, and (3) difficulties to mitigate the negative consequences of the unfortunate event (Berloffa and Modena, 2014; D'Ambrosio and Rohde, 2014; Hacker et al., 2010; Osberg, 1998; Osberg and Sharpe, 2005; Rohde, Tang and Rao, 2014; Rohde and Tang, 2018; Romaguera-de-la-Cruz, 2020). Most researchers have focussed on measuring objective economic insecurity aiming to capture the exposure to downside risk. This kind of measures reflect the likelihood of an economic hazard in a near future with negative consequences should the risk materialise and individuals lack sufficient protection mechanisms (Hacker, 2018; Osberg, 2018). This approach offers many advantages, as the use of objective indicators provides reliable information on individual risks, simplifying the design and implementation of public policies. Moreover, economic insecurity indices can be based on living conditions surveys which are broadly available and regularly produced. Additionally, the use of objective indicators avoids the potential bias and high heterogeneity more frequently associated with subjective measures.

We can find several proposals to measure objective economic insecurity with both unidimensional and integrated approaches. Within the indices based on a single indicator, many researchers use standard variables in welfare analysis. Income is the most used dimension since it is a well-established indicator of living standards and represents the most liquid monetary resource to turn to in the event of financial difficulties or unexpected expenses. Furthermore, data on income is widely available and regularly produced, and there are some harmonised databases which allow for the comparison of well-being phenomena in several countries. Rohde, Tang and Rao (2014) identify economic insecurity with downward income instability (estimated as descending deviations from the trend in household incomes), while Nichols and Rehm (2014) estimate a measure of income risk as the aggregate income variability across individuals and time. Watson (2018) assesses economic insecurity with a forward-looking approach based on the individual propensity to experience a large income drop from one period to the next. Bossert et al. (2022) estimate insecurity through income streams (as they believe individuals' prospects are shaped by past variations of resources rather than their levels), while Rohde et al. (2020) measure individual economic insecurity as unforeseeable volatility in future monetary resources by using prospect theory.

Conversely, Bossert and D'Ambrosio (2013) approximate economic insecurity with wealth, considering net wealth levels (assets minus liabilities) as an emergency reserve that individuals could convert to income in the event of an adverse financial shock, while past variations in net wealth shape individuals' economic prospects. Nonetheless, this measure does not consider the entire wealth stock but only private stocks, leaving out most liquid assets as well as public and private entitlements (Cantó et al., 2021; Osberg, 2018).

Both income and wealth have a theoretical basis to be used when aiming to measure economic security. Nevertheless, unidimensional insecurity indices show contradictory results when used in empirical analysis depending on the key variable considered. Regarding measures based on income, Rohde, Tang and Rao (2014) discover that the US is the most insecure country when using post-government incomes, in the same vein as Nichols and Rehm (2014). When comparing economic insecurity in Germany and the US, Rohde et al. (2020) also point out to the US as the country with the highest levels of exposure to income risk. On the contrary, the Bossert and D'Ambrosio (2013) wealth-based index reveals lower levels of insecurity in the US when compared to Italy because of greater financial assets' accumulation but also a larger negative impact of the Great Recession on the former because of the decline in assets' prices (D'Ambrosio and Rohde, 2014).

Previous proposals highlight that the use of domain-specific measures to approximate economic insecurity are highly conditioned to the selected variable, as using either income or wealth can capture one undesirable facet of risk but not the phenomenon to its full extent, leading us to opposite conclusions for the same country or population (Rohde, Tang and Osberg, 2017; Romaguera-de-la-Cruz, 2020). In this context, Hacker et al. (2010, 2014) come up with an integrated measure (*Economic Security Index*, ESI) that identifies economic insecurity with the share of individuals at a given society who experience a large income drop (equal or higher to 25%) as long as they lack sufficient liquid financial wealth to deal with economic loss and subtracting medical out-of-pocket expenditure (especially relevant in the US). The existence of precautionary savings offers the individuals an additional protection against economic distress beyond income, leaving those people with low and volatile incomes who lack accessible savings much more exposed to objective risk than those owning some liquid wealth. Despite the advantage of taking into account both income and wealth, the ESI measure only considers wealth as a buffer stock but does not capture variations in wealth as a consequence of asset accumulation or changes in their rates of return, which could be an additional source of financial distress beyond income losses. Furthermore, this measure does not include other less liquid assets as housing or real estate and is not able to reflect the individual exposure to risk since the use of retrospective data only enables the researchers to infer the risk of a given subpopulation through actually realised hazards (Hacker et al., 2014). Moreover, voluntary reductions in household income cannot be distinguished from involuntary losses, the latter being the only ones relevant to insecurity (Osberg, 2018).

There have been other efforts to measure economic insecurity with composite indicators and a variety of dimensions (Bucks, 2011; Cantó et al., 2020; Osberg and Sharpe, 2005, 2014; Rohde et al., 2015, 2016; Rohde, Tang and Osberg, 2017; Romaguera-de-la-Cruz, 2020). It is true that multidimensional measures of economic insecurity may be useful when trying to capture diverse aspects of the phenomenon. However, the analysis of separate dimensions may lead to inconclusive results while the construction of a synthetic index is not straightforward and implies several normative decisions regarding the selection of indicators, aggregation and weighting procedures (OCDE, 2008). Moreover, data requirements are highly increased, especially when computing insecurity indices at the individual level.

As far as we know, this is the first paper to assess objective economic insecurity by considering both income and wealth together in a single distribution. Even though our approach can be framed into the prospective unidimensional proposals to measure economic insecurity, we benefit from the advantages of an integrated measure that captures all the potential resources that individuals can draw on in case they suffer a forthcoming economic loss.

3. Methodology

3.1. Construction of an extended well-being measure

We follow the Weisbrod and Hansen (1968) approach to approximate individuals' potential resources by combining income and wealth into a single distribution through the following formula in a similar manner as Wolff and Zacharias (2009):

$$Y_i = L_i + (H_i - M_i) + NLQ_i + (LQ_i - D_i) + P_i \tag{1}$$

where Y_i represents the level of well-being for household i. L_i denotes labour income and includes both wages and self-employment income. The net flow of income generated by housing is then added, where H_i represents the imputed rent to owner-occupied housing and M_i the reported values of mortgage payments. Moreover, we take into consideration the net income flow from non-liquid assets, NLQ_i (such as other real estate, business assets and pension assets). LQ_i represents the flow from financial assets and the reported values from savings and current accounts net of the annuitized value of other debt D_i, and P_i refers to public transfers. The household well-being level Y_i is then adjusted for inflation (expressed in 2015 dollars) and equivalised using the OECD-modified scale.[1]

Household current wealth stock needs therefore to be converted into a flow of income so both variables are measured in the same unit of analysis. Thus, one unit of wealth is transformed into one unit of income as follows (Brandolini et al., 2010; Weisbrod and Hansen, 1968):

$$W_{ij} = \left[\frac{\rho_j}{1-(1+\rho_j)^{-n}}\right] * A_{ij} \tag{2}$$

where W_{ij} refers to annuitised income of asset j for household i; ρ_j is the annual rate of return for asset j from 1999 until 2019; A_{ij} is the reported value of asset j for household i; and n represents the length of the annuity.[2] As households do not report the rate of return for each asset type, we use the information from the System of National Accounts (SNA) to be consistent with the macroeconomic trend of wealth and its importance for the household sector (Wolff et al., 2012; Wolff, 2022). The annuity length is approximated as the expected remaining years of life of the oldest person in the household, which is measured by the years of life expectancy regarding age and gender obtained from the National Center for Health Statistics (NCHS). Furthermore, we modulate this annuity length according to the civil status of individuals: $n = T$ for unmarried individuals, and $n = T_1 + (T - T_1)b$ for those married; where T_1 refers to the remaining years of life for the person who is expected to die first, T are the remaining years of life of the survivor and b is the reduction in the equivalence scale after the death of the first person.

[1] For more details on the components of the extended well-being measure, see Table A1 in the Appendix.

[2] We could also use the bond coupon method to obtain the flow from wealth (Larrimore et al., 2021; Smeeding and Thomson, 2011). However, this method is more suitable to compute non-realized capital gains instead of households' potential resources, which is the interest of our analysis.

In this paper, we annualise five asset and debt classes: real estate, financial assets, business assets, mortgage debt and other debt (see Table A1).[3] The value of the main residence is transformed into an annual income stream to approximate the imputed rents of owner-occupied households (Wolff and Zacharias, 2009). We compute the value of imputed rents to show higher well-being of homeowners compared to those who are renting. The main residence can be used as collateral or converted directly into cash, providing more mechanisms to face an unexpected shock. However, owning your main residence could also be a burden when mortgage payments increase dramatically or if the value of the property plummets.

This procedure enables us to estimate all potential economic resources that households could use to smooth their consumption, either to save or to face unexpected negative shocks, which leads us to a more precise measurement of economic insecurity. Our method goes beyond the consideration of income as the main dimension of economic insecurity and aims to disentangle the additional role of wealth and financial liabilities in this phenomenon. The joint consideration of income and wealth may imply that households are more (or less) vulnerable to insecurity than their income level would suggest. Moreover, our approach allows for the variation of wealth over the lifetime of the holder, while we use different rates of return for each type of assets. Therefore, we are able to compute households' possibilities to smooth out consumption depending on their income level, wealth composition and age, which is crucial for our analysis: those households that may offset a loss in income with annuitized wealth will not be considered economically insecure.

We must also keep in mind that this method also has some limitations. For instance, the same wealth level will result in a larger income flow for older individuals as their expected remaining years of life are lower than for younger people, resulting then in a higher concentration of annuitized wealth. Also, we consider bequests equal to zero as we assume that the wealth component is totally consumed by the end of the expected lifetime. Nevertheless, we do not believe these limitations to be affecting the study of economic insecurity as our aim is to capture the exposure to financial risk and the lack of

[3] Real estate does not include the main household residence. Financial assets include stocks and other assets such as life insurance. Mortgage debt of the main residence is annuitized when households do not report monthly mortgage payments, while other debt includes credit card debts, student loans and other values reported by households. We do not annuitize the value of current and saving accounts and instead we use the reported value.

sufficient protection mechanisms. Thus, the resources individuals have to smooth their consumption will necessarily depend on age. On other hand, bequests are not likely to influence much on economic insecurity as, in a context of hard financial difficulties, individuals would resort to all their available resources to overcome distress.

3.2. How do we measure objective economic insecurity?

Economic insecurity is a forward-looking concept, as it involves future economic states. Therefore, analysing directly short-term well-being drops do not enable us to estimate economic insecurity individually: these falls in well-being are the realization of a given economic risk but do not identify the exposure to the risk itself as we are using retrospective data. Therefore, an individual cannot be classified as insecure or secure, and we can only assume that individuals belonging to a specific subpopulation suffer from the average level of insecurity (Hacker et al., 2014).

As we need to anticipate the individuals' degree of risk in later periods, we chose to calculate economic insecurity as the individual predicted propensity to suffer well-being losses through pooled probit estimations:

$$Pr(EI_{it} \mid X_{it-1}, \delta t) = \emptyset(\beta X_{it-1} + \delta t + u_{it}) \tag{3}$$

where EI_{it} is a dummy indicator of large short-term well-being reductions, $\emptyset$ is the cumulative distribution function of the standard normal distribution, X_{it-1} represents a variety of sociodemographic characteristics of the household head in the previous period[4] and t are year dummies.

To obtain our dependent variable, we classify individuals between those who have suffered a sizable well-being loss from one period to the next and those who have not as follows:

$$EI_{it} = \begin{cases} 1 & if\ \dfrac{wb_{it} - wb_{it-1}}{wb_{it-1}} \leq k \\ 0 & otherwise \end{cases} \tag{4}$$

[4] We may note that the household is our unit of measure even if the individual is considered as the unit of analysis: to estimate economic insecurity we make use of household data as we believe negative financial shocks are usually smoothed by the pooling of monetary resources of all household members.

where wb_{it} is an equivalised real measure of well-being for individual i at moment t, wb_{it-1} is that of the preceding period, and k is the minimum amount of loss in order to consider a reduction in well-being as sizable. We identify this well-being with the EW measure defined in the previous section, although we also consider income and wealth separately as benchmarks.

To define the threshold k used to determine well-being losses, we rely on the ESI indicator (Hacker et al., 2014), which sets a threshold of 25 percent of household income loss from one period to the next. This threshold represents the three months that the US population could maintain their welfare levels without their current income before experiencing hardship, as suggested by the American National Election Study (Hacker et al., 2013). In this context, we propose a threshold of 15 percent of EW loss to estimate our insecurity index, which is the amount equivalent to 25 percent of annual income in our EW measure. In addition, we apply the same logic to net wealth, setting a threshold of 7 percent.[5]

As explanatory variables, we include several sociodemographic characteristics related to the head of the household in the previous period, as we assume complete pooling of the monetary resources of all members. As demographic variables we include gender, age, race, years of completed education and region of residence. We also include the civil status as well as his overall health status to account for two of the main possible causes of future distress: family breakup and illness (Osberg and Sharpe, 2005, 2014). To capture the insecurity stemming from the labour market, we consider the employment status, whether individuals are self-employed, whether they work for the government, and the occupation and industry of their main job. Long-term average EW is introduced to capture the permanent socioeconomic status of households. Additionally, we take into account household composition by including the number of household members as well as the number of children. Finally, we introduce yearly dummies to capture the effects of the business cycle.

[5] Alternatively, we estimate the probability of experiencing EW losses using a threshold of 10% and 20% (see Figure A1 and A2 in Appendix). The trend in economic insecurity is robust to the selection of the threshold, while its level is slightly higher for the 10% threshold and decreases for the 20%. Therefore, we choose the 15% threshold for the main analysis as it follows exogenous information about future economic losses and insecurity, avoiding potential endogeneity issues.

Once we obtain the association between last period sociodemographic characteristics and realised large well-being losses, we can predict the probability of experiencing these losses in the following period by multiplying the obtained coefficients by the present value of the explanatory variables. This strategy allows us to predict the propensity of economic insecurity in a near future through present characteristics of the household, thus generating a forward-looking insecurity measure which ranges from 0 to 100. Unlike large short-term drops in well-being, this probability enables us to analyse economic insecurity with a prospective approach: we can study which part of insecurity can be predicted due to individual and household characteristics beyond risks already realised. Nonetheless, this method also has some limitations as we are not able to capture unpredictable economic shocks that are independent of household characteristics.

3.3. Sources of economic insecurity

Once we have estimated our economic insecurity index, we apply an econometric strategy to understand the role of each component of our EW measure in shaping this phenomenon. To that extent, we divide the population into two groups: individuals who are more likely to experience short-term well-being losses than the population average for the entire period of analysis (low-risk individuals or LR) and those who are less likely (high-risk individuals or HR).[6] Then, we examine changes in the values and composition of EW components for these two groups to disentangle the main factors influencing their degree of economic insecurity.[7]

First, we analyse changes in the tenure of different well-being sources for each group by estimating a series of ordinary least square (OLS) regressions with individual fixed effects (Amuedo-Dorantes and Borra, 2018):

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[6] The average probability of experiencing a well-being loss for the whole period of analysis is 33%. We define the groups by considering the average individual probability for the entire period, so that those individuals who are more (less) economically insecure have an individual propensity to suffer well-being losses higher (lower) than 33%. As a robustness check, we define these groups by considering the average probability of suffering an economic loss in 2001 (the first period for which we have economic insecurity results), in 2009 (when we find the highest propensity to experience well-being losses) and 2019 (the most recent year). The results are consistent whatever strategy we use to define the groups (from Table A2 to A7 in Appendix)

[7] We provide alternative estimates of the probability of well-being losses using different definitions of EW measures and income definitions to show the complexity of understanding the role of each source (see Figures A3 and A4 in Appendix).

$$Pr(y_{it} = 1 | X_{it,} \delta t) = \delta_0 + \delta t + \theta X_{it} + \alpha_i + u_{it} \quad (5)$$

where y_{it} takes the value one if the individual owns a certain kind of well-being component and the value zero otherwise. As explanatory variables, we include time year dummies (t) and control for a series of time-varying household characteristics (X_{it}) such as age, marital status, health status, race, and years of education of its head, region of residence, type of household, household size, and the number of children. The variable α_i captures all unobserved, time-invariant individual level characteristics that have an influence on y_{it}, whereas u_{it} is the idiosyncratic error term. The main variable of interest in our analysis is δt, which captures changes in the holding of each well-being source with respect to 1999 (composition effect).[8] We account for the stratified sampling design and attrition by using 2019 longitudinal household weights.

On other hand, we also explore whether assets' values have varied in the last two decades and if this evolution has been different for individuals with a high risk of well-being losses compared to those with low risk:

$$y_{it} = \delta_0 + \delta t + \theta X_{it} + \alpha_i + u_{it} \quad (6)$$

where y_{it} is the logarithm of each EW component for individual i in year t. In this case, δt captures changes in the value of different components of our EW measure with respect to 1999 (price effect).

The regression analysis described previously allows us to analyse all the multiple effects that each source of our EW measure has on economic insecurity by comparing the coefficients of year dummies for individuals with high risk of well-being losses and those with low risk. Therefore, we expect decreases in both the tenancy and value of any well-being component to be associated with a greater likelihood of experiencing economic hardship in the near future, and we expect this relationship to be stronger for individuals with high levels of economic insecurity.

We study the following well-being components: household incomes, imputed rents for the main residence, mortgage payments, non-liquid assets and liquid resources. With

[8] We take 1999 as the reference year as it is the first period in our dataset. We must recall that we cannot calculate the economic insecurity index for that specific year as it is based on a dynamic approach.

respect to household income, we expect that any variation caused by unemployment, reduced working hours or lower benefit amounts will increase the probability of future well-being losses, while higher labour income or public transfers will provide additional coping capacities to deal with a negative shock.[9]

Regarding the main residence, we expect a reduction in economic insecurity when the value of imputed rents increases, either due to higher house prices or lower mortgage payments. An increase in the value of the main residence reflects that homeowners will have more potential resources to cope with an economic shock, while an increase in the probability of owning the main residence suggests that households have sufficient resources to acquire a first residence and that housing market conditions are adequate for this purpose. We also analyse changes in mortgage payments to capture the influence of this type of debt on economic insecurity, as higher mortgage payments reduce households' resources. However, a higher probability of having a mortgage could be associated with increased well-being for homeowners, in the same vein as for imputed rents. A lower probability of having a mortgage could imply that households have paid off their mortgage debts, which reduces their exposure to an objective risk.

On the other hand, non-liquid assets cannot be easily converted into cash and have additional long-term effects on well-being. We calculate the probability of holding such assets to evaluate whether households have sufficient savings to invest in long-term resources. Furthermore, falling rates of return would deplete past savings invested in these assets, diminishing the ability of households to weather an economic downturn. Estimates of the changes in non-liquid assets' value capture the volatility in the rates of return during this turbulent period and their role in shaping economic insecurity.

Households have easy access to liquid assets and therefore use them first to offset an economic shock. Thus, a higher probability of having positive liquid assets indicates whether households were able to increase their protection mechanisms by disposing of savings or investing larger amounts in stock markets. Nevertheless, changes in the value of liquid assets capture the extent to which households' savings increased or whether they have already made use of these resources, in addition to capturing stock market volatility.

[9] We do not estimate equation (5) for the case of income, as most of the US population already has positive amounts of this component.

3.4. Data

Our data come from the Panel Study of Income Dynamics (PSID), which is a household longitudinal survey conducted in the US by the University of Michigan since 1968. This database contains household information on employment, income, wealth, expenditures, health, marital status and education among other topics. Since 1997, data have been collected on a biennial basis. In this paper, we use data from 1999 to 2019 to analyse economic insecurity over the last two decades, studying the impact of the Great Recession on this phenomenon and the subsequent economic recovery. Data are collected in the survey year, income is reported for the previous year, and wealth for the survey year (time of the interview).

To estimate our joint distribution of income and wealth, we assume that income is reported in year t and wealth at the beginning of that same year. This could lead to double counting of some resources, especially those related to asset income or rental income. Therefore, we exclude all items related to capital income. If these incomes are not enough to cope with distress, people will then draw on past savings and wealth accumulated up to that moment. Our joint distribution is then the sum of all non-capital income concepts and the flow obtained from the wealth components. We use the reported values for current accounts, cash and savings, as in the event of an economic downturn households would use these first before selling other assets. We also take into account the reported value of monthly mortgage payments, which we convert into an annual amount by multiplying by 12. For households that do not report monthly mortgage payments, we annualise the value of the total mortgage considering the years remaining to repay the mortgage.

4. Results

4.1. How are income and wealth distributed in the US?

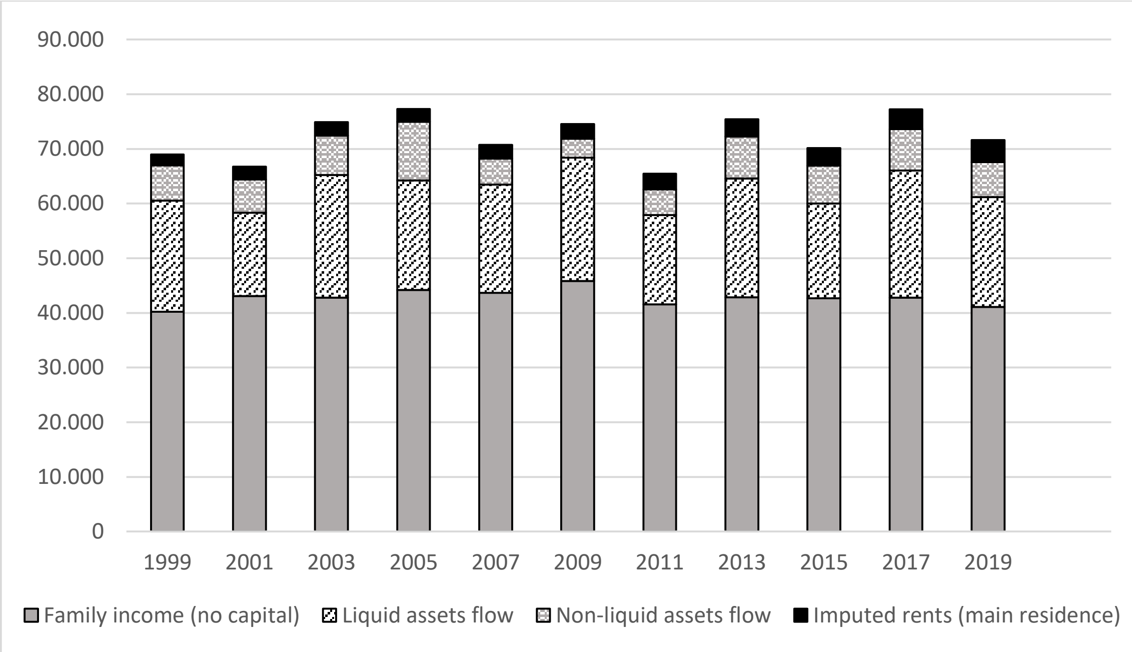
Figure 1 shows the evolution of our EW measure from 1999 to 2019. We can observe that average EW values are influenced by income and wealth levels, but also by fluctuations in the rates of return of each asset from which we obtain a flow. This implies that our joint income-wealth measure follows its own trend driven by compositional and price effects. The EW measure adds from 50 to 80% of income flow to standard gross family income.[10] The joint distribution increased during the pre-crisis period up to 2009, although households lost well-being during the dotcom crisis in 2001 and in the prelude of the economic crisis in 2007. The Great Recession hit hardest in 2011, when EW reached its lowest value. During the economic recovery, this variable experienced uneven growth driven by the evolution of liquid assets and household income levels.

Family income is the largest source of our extended measure with an average share of 60% that decreases during expansionary periods (Figure A5). In terms of the flow we derive from wealth concepts, liquid assets (current and saving accounts and the flow from equities and other assets) account for around 27% of total well-being, with a higher share when favourable macroeconomic conditions lead to higher stock market rates of return and higher savings. It is also observed that during periods of recession, especially in 2001 and 2011, the value of these assets decreases as people tend to use their savings to smooth out consumption and due to the volatility of stock markets. Non-liquid assets (real estate other than the main residence, business assets and private pensions) represent 9% of well-being on average, following a similar trend to liquid assets, but even more dependent on the business cycle. Finally, the average share of imputed rents has been constant in the period of analysis (6%). However, the absolute value of these imputed rents has grown steadily since 2007 despite the collapse in the value of home equity between 2009 and 2013. This result is partly explained by lower annual mortgage payments (see Figure A6).

Previous results are average values for the whole population, but these patterns change depending on the position of individuals in the EW distribution. Figure 2 shows the relative importance of each source by decile of EW. In the bottom 50% of the population, well-being is mainly determined by family income. The weight of annuitized wealth is higher for individuals between the fourth and ninth decile, although family income remains the most important source of EW. Conversely, the flow from wealth components is the most relevant source for the well-being of those at the top.

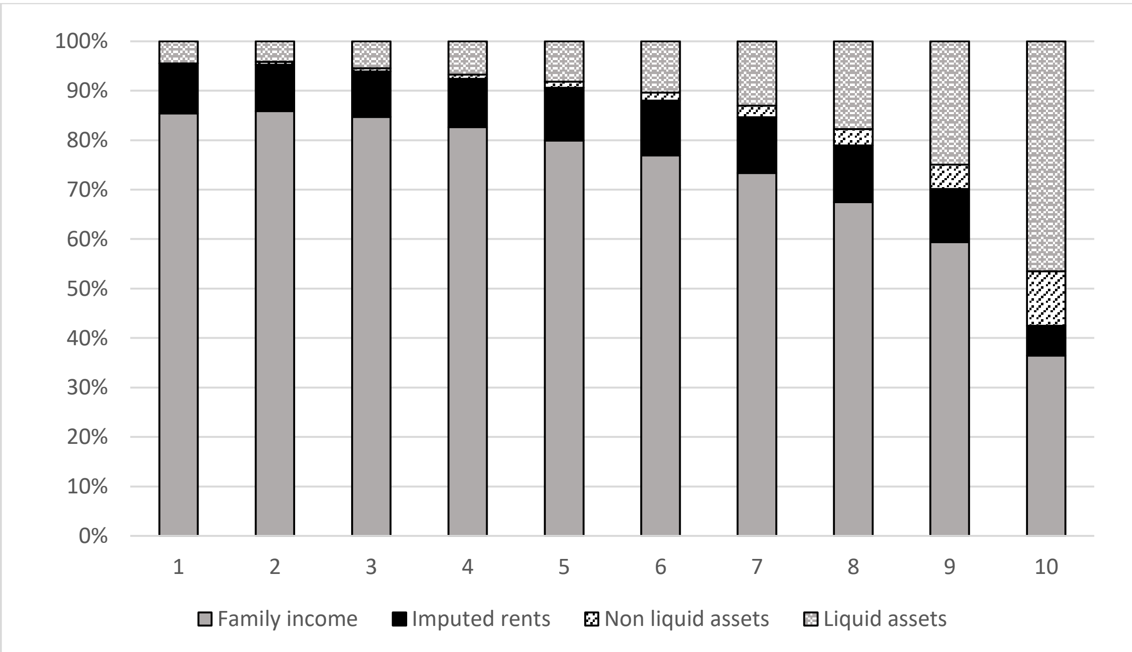
[10] We add a higher amount of income flow compared with other authors such as Wolff et. al (2012) and Gallusser and Krapf (2022) mainly because we use the reported values of cash and currents accounts.

FIGURE 1. Average extended well-being by sources. 1999 - 2019



Source: Author's calculations based on PSID data set using cross-sectional weights.

FIGURE 2. Composition of extended well-being by decile.



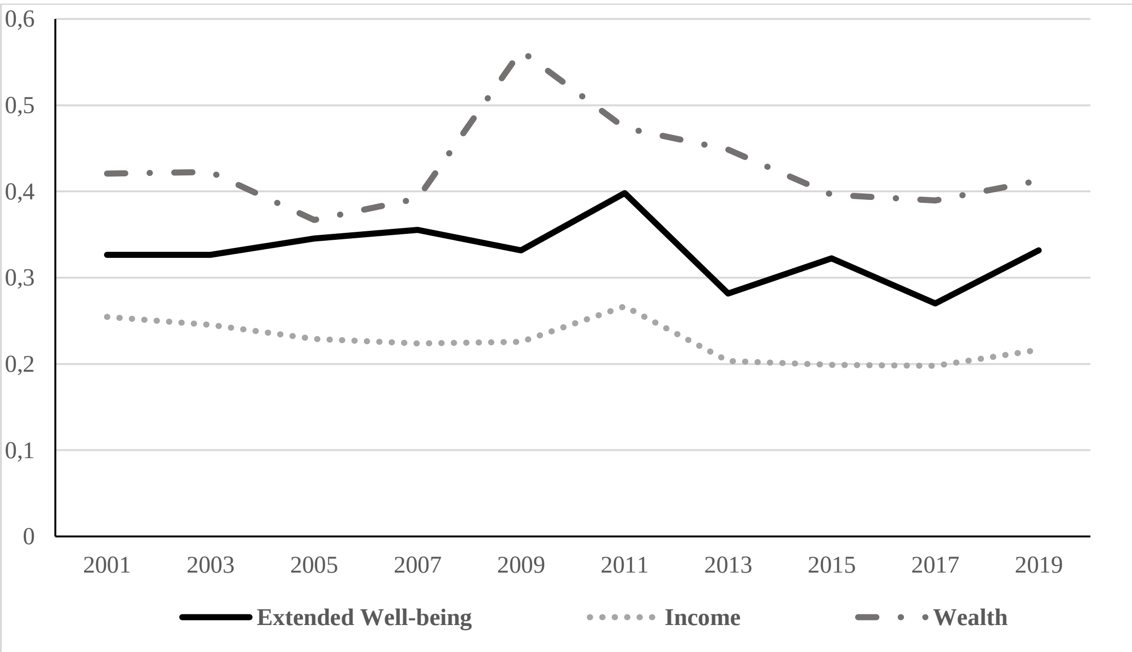
Source: Author's calculations based on PSID data set using cross-sectional weights.

Note: to calculate the EW deciles we use the pooled data.

4.2. Economic insecurity results

We analyse the degree of economic insecurity in the US by considering the predicted propensity of suffering large short-term declines in our measure of EW. We also show the results considering income and wealth separately to analyse whether this phenomenon is robust to the use of different welfare indicators (Figure 3). Overall, the average probability of suffering well-being losses in the future over the whole period of analysis is 33% when calculated with EW, while it is approximately 22% when considering income alone and 43% when using wealth. These differences could be explained by the higher volatility of wealth, driven by large variations in the market value of real estate assets (Menta et al. 2022). Moreover, adding the flow from wealth to household income implies a higher risk of future economic hardship and thus a higher degree of economic insecurity. The use of wealth to cope with an economic shock could lead households to a situation where they lose a significant amount of their economic resources being unable to recover in the short term. In addition, households could suffer a loss due to downward volatility in financial or real estate markets. Our extended measure can capture the risk associated with both scenarios.

FIGURE 3. Average economic insecurity. 2001 – 2019



Source: Author's calculations based on PSID data set using cross-sectional weights.

We also note that the expansionary period prior to the 2008 financial crisis reduced economic insecurity based on income and wealth. The Great Recession hit income-based insecurity in 2011, when the probability of experiencing forthcoming losses reached 27%.

Furthermore, the crisis saw a dramatic increase in wealth-based economic insecurity to 56% in 2009, driven by the collapse in the value of home equity which is the main asset of household wealth. Despite the fall in real estate assets (other than the main residence) and business assets, which seems that have mainly affected those at the top of the wealth distribution, wealth-based insecurity started to decline in 2011, following the turn of the economic cycle until 2019 when it increased to 41%.

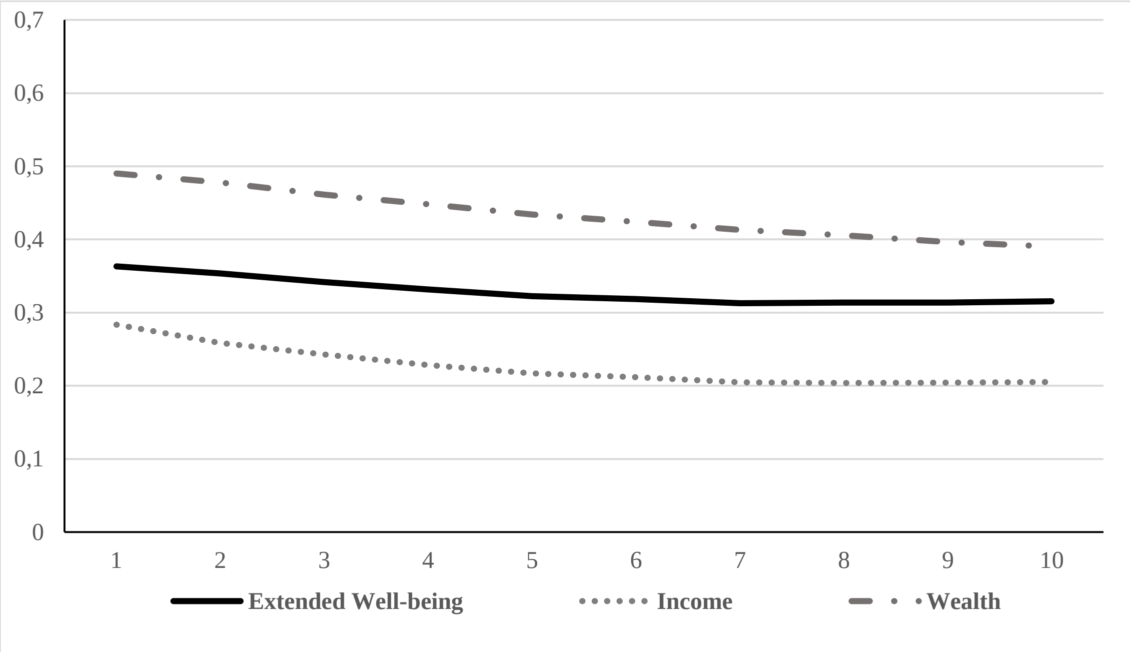
EW-based insecurity follows its own trend over several years, which makes its inclusion in insecurity analysis more relevant. It does not describe the same reduction in the probability of well-being losses before the 2008 crisis as when using income and wealth: we can observe a slight increase in economic insecurity in 2005, which may be driven by rising mortgage payments and short-term debt (Figure A6), and also in 2007 due to negative rates of return on real estate and business assets used to obtain the flow from wealth (Table A9). Changes in EW-based insecurity between 2009 and 2013 were mainly due to household income and a lower amount of liquid assets in 2011. These results indicate that the collapse in home equity values did not significantly affect the average probability of losses in our extended measure in 2009 as the average values of imputed rents remained stable partly helped by the reduction in mortgage payments. However, this indicator shows a cyclical trend after the Great Recession, with an increase in the probability of EW declines in 2015 (32%) following uncertainty in stock markets and in 2019 (33%) due to falling household incomes and declining current accounts and savings.[11]

Figure 4 presents average economic insecurity by EW deciles. As expected, a general negative trend is observed: the individual propensity of well-being losses becomes lower as one moves up the EW ladder, although the difference between the lowest and the highest decile is approximately 5 percentage points (p.p.). The estimation of the joint distribution of income and wealth together with the inclusion of a variety of sociodemographic characteristics when estimating probabilities leads to a reordering process that compresses the differences in insecurity between deciles. The income-based distribution of insecurity describes a similar shape to that of EW, partly because household income remains the main source of well-being throughout the distribution

[11] The uncertainty we refer to was associated with the FED's doubts about the rise of interest rates and the Greek debt among others. This reduced the rate of return as can be seen in the macroeconomic aggregates which implied lower amounts in liquid assets in 2015.

except for those at the top, with a difference in probability between the top and the bottom of 8 p.p. This reduction is more pronounced when we analyse the probability of wealth losses, probably because the greater accumulation of assets of different types at the top of the EW distribution allows those individuals to diversify risk.

FIGURE 4. Average economic insecurity by year and EW decile



Source: Author’s calculations based on PSID data set using cross-sectional weights.

Table 1 displays economic insecurity by diverse socioeconomic groups. In general, the results are robust whatever variable we consider, although the levels of insecurity are higher when wealth is used. In terms of age, households headed by young individuals (aged 16-34) are more exposed to risk whichever approach we use to assess economic insecurity. Households headed by 35–54-year-olds face lower levels of insecurity when it is measured by income and EW, probably due to more stable and less precarious labour market conditions. Elderly-headed households (all aged 55+) are the most secure if we focus on the probability of wealth losses, but those aged 65+ are the second most vulnerable group if we consider EW. This result highlights the larger asset accumulation at the end of the life cycle, which may act as a consumption smoothing mechanism. Nonetheless, by transforming this wealth stock into a flow of income, insecurity in old age is mainly due to large short-term drops in income. Older individuals may be affected by fluctuations in the value of their private pension plans (IRAs). Furthermore, we find that female-headed households are always more insecure than those headed by men, regardless of the dimension used.

TABLE 1. Average economic insecurity by population groups

	Extended well-being	Income	Wealth
Age of head			
16-24	0.42	0.34	0.46
25-34	0.33	0.23	0.46
35-44	0.31	0.20	0.43
45-54	0.31	0.19	0.42
55-64	0.31	0.22	0.42
65+	0.36	0.24	0.39
Gender of head			
Female	0.36	0.26	0.47
Male	0.31	0.21	0.41
Civil status of head			
Married	0.32	0.22	0.42
Never married	0.30	0.22	0.42
Widowed	0.37	0.22	0.48
Divorced	0.35	0.25	0.45
Race of head			
White	0.32	0.22	0.42
Black	0.36	0.27	0.47
American Indian	0.36	0.28	0.42
Asian	0.33	0.21	0.39
Other	0.33	0.22	0.43
Years of education of head			
Less than 12 years	0.37	0.26	0.58
12 to 15 years	0.35	0.23	0.53
16 years or more	0.31	0.20	0.45
Employment status of head			
Employee	0.29	0.19	0.40
Self-employed	0.38	0.30	0.45
Unemployed	0.43	0.38	0.49
Retired	0.37	0.24	0.46
Other inactive	0.37	0.27	0.48
Family type			
One adult, no children	0.32	0.22	0.43
One adult with children	0.35	0.25	0.44
Several adults, no children	0.34	0.24	0.42
Several adults with children	0.31	0.20	0.43

Source: Author's calculations based on PSID data set using cross-sectional weights.

On the other hand, black and American Indian households are more exposed to objective risk. White individuals are the least likely to suffer drops in wealth, but they are more likely to suffer income losses than Asian households, which are the most secure in terms of income and wealth. When analysing insecurity by household type, we find that single-parent families suffer the highest levels of insecurity followed by individuals living alone. This may be due to the pooling of the monetary resources of all household members: single individuals only rely on their income and accumulated wealth, which will probably be lower than households with more adults.

Economic insecurity decreases as years of completed education grow and its reduction is larger when individuals have at least 16 years of education. Regarding labour market status, the unemployed are the most insecure whatever method we use, followed by inactive households. This result evinces the lack of public benefits that prevent people from experiencing large drops in well-being when they are unable to work or suffer the loss of employment. The self-employed are the most protected group when measuring the probability of wealth losses, suggesting that they possess wealth to be protected from income volatility. In line with the degree of insecurity by age group, retired individuals would suffer less from wealth falls as they hold a larger stock of wealth.

4.3. Drivers of economic insecurity

Thus far, we have analysed the evolution and distribution of economic insecurity approximated by the predicted probability of short-term losses in EW greater than 15%. But which are the main drivers of this phenomenon? Which EW components are related to higher levels of risk? To answer these questions, we examine if the evolution of diverse well-being sources has been different for individuals with a higher risk of future economic distress than the population average (HR group) compared to those with an exposure to risk lower than the general mean (LR group).[12] We therefore apply the fixed effects estimations described in equations (5) and (6) for each group, studying to what extent changes in the tenancy (composition effect) and value (price effect) of several resources may be associated with the propensity of future drops in well-being. We also test if differences in the coefficients between both groups are significant.

[12] The counterfactual analysis shows vague inconclusive on the role of each component in economic insecurity (see Figures A3 and A4). This analysis consists of adding sequentially each component of the EW measure to look into the contribution to economic insecurity of each source.

Table 2. Trends in asset ownership (flow) of those with higher/lower probability of being insecure

	P(EW>0) (1)			P(Imputed>0) (2)			P(Mortgage>0) (3)			P(Non-liquid>0) (4)			P(Liquid Assets>0) (5)		
	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk
Year 1999		Ref.			Ref.			Ref.			Ref.			Ref.	
Year 2001	0.007**	0.002	0.005	0.001	-0.008	0.009	-0.001	0.007	-0.008	0.015	0.034**	-0.018	-0.019**	-0.009	-0.01
	(0.003)	(0.003)	(0.004)	(0.01)	(0.013)	(0.016)	(0.008)	(0.011)	(0.014)	(0.011)	(0.013)	(0.017)	(0.009)	(0.01)	(0.014)
Year 2003	0.004	0.001	0.004	0.003	-0.014	0.016	-0.006	-0.004	-0.002	0.025**	0.050***	-0.024	-0.003	-0.008	0.005
	(0.003)	(0.003)	(0.005)	(0.012)	(0.017)	(0.021)	(0.011)	(0.016)	(0.019)	(0.012)	(0.016)	(0.02)	(0.011)	(0.014)	(0.018)
Year 2005	0.006*	0	0.006	-0.004	-0.033	0.029	-0.01	-0.011	0	0.031**	0.058***	-0.027	-0.016	-0.006	-0.011
	(0.004)	(0.003)	(0.005)	(0.014)	(0.022)	(0.026)	(0.013)	(0.02)	(0.024)	(0.014)	(0.018)	(0.023)	(0.013)	(0.017)	(0.022)
Year 2007	0.003	-0.001	0.005	-0.013	-0.048*	0.035	-0.023	-0.024	0.001	0.025	0.054**	-0.029	0.005	-0.011	0.016
	(0.004)	(0.004)	(0.005)	(0.016)	(0.026)	(0.031)	(0.014)	(0.026)	(0.029)	(0.016)	(0.021)	(0.026)	(0.016)	(0.022)	(0.027)
Year 2009	0.004	-0.003	0.007	-0.003	-0.046	0.043	-0.035**	-0.027	-0.007	0.007	0.050**	-0.043	0.006	-0.022	0.027
	(0.005)	(0.004)	(0.006)	(0.019)	(0.032)	(0.037)	(0.016)	(0.031)	(0.035)	(0.018)	(0.024)	(0.03)	(0.017)	(0.026)	(0.032)
Year 2011	0.003	0.004	-0.001	0.004	-0.038	0.042	-0.045**	-0.038	-0.007	-0.021	0.035	-0.056	-0.057***	-0.060*	0.004
	(0.005)	(0.004)	(0.006)	(0.022)	(0.037)	(0.043)	(0.018)	(0.036)	(0.04)	(0.02)	(0.028)	(0.035)	(0.02)	(0.031)	(0.037)
Year 2013	-0.001	0.007*	-0.008	0.021	-0.016	0.038	-0.067***	-0.054	-0.013	-0.033	0.033	-0.065*	-0.060**	-0.05	-0.01
	(0.006)	(0.004)	(0.007)	(0.024)	(0.042)	(0.048)	(0.02)	(0.041)	(0.046)	(0.022)	(0.032)	(0.039)	(0.024)	(0.035)	(0.043)
Year 2015	0.003	0.004	-0.001	0.034	-0.02	0.054	-0.070***	-0.064	-0.006	-0.043*	0.028	-0.071*	-0.054**	-0.047	-0.008
	(0.007)	(0.005)	(0.008)	(0.027)	(0.047)	(0.054)	(0.022)	(0.046)	(0.051)	(0.025)	(0.035)	(0.043)	(0.026)	(0.041)	(0.048)
Year 2017	0.004	0.007	-0.003	0.04	0.021	0.02	-0.082***	-0.073	-0.01	-0.053*	0.03	-0.083*	0.082***	0.041	0.04
	(0.007)	(0.005)	(0.009)	(0.03)	(0.053)	(0.061)	(0.024)	(0.052)	(0.057)	(0.027)	(0.039)	(0.048)	(0.029)	(0.045)	(0.054)
Year 2019	0	0.005	-0.005	0.038	0.059	-0.021	-0.089***	-0.08	-0.009	-0.036	0.053	-0.090*	0.031	0	0.031
	(0.008)	(0.005)	(0.01)	(0.033)	(0.058)	(0.067)	(0.027)	(0.057)	(0.063)	(0.03)	(0.043)	(0.052)	(0.032)	(0.05)	(0.059)
Obs.	35146	29339	64485	35146	29339	64485	35146	29339	64485	35146	29339	64485	35146	29339	64485

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses.
Source: longitudinal PSID data

Table 3. Trends in the flow from asset values and family income of those with higher/lower probability of being insecure

	Log of positive EW (1)			Log of positive imputed rents (2)			Log of positive Mortgage (3)			Log of positive non-liquid assets (4)			Log of positive liquid assets (5)			Log of positive income (6)		
	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk	Higher risk	Lower risk	Low/High risk
Year 1999		Ref.			Ref.			Ref.			Ref.			Ref.			Ref.	
Year 2001	-0.035*	0.011	-0.045	-0.023	-0.043	0.02	0.005	0.053**	-0.047	-0.037	0.234**	-0.271**	-0.314***	-0.263***	-0.051	-0.006	0.063***	-0.069***
	(0.02)	(0.018)	(0.028)	(0.035)	(0.067)	(0.076)	(0.024)	(0.022)	(0.033)	(0.07)	(0.092)	(0.116)	(0.054)	(0.055)	(0.077)	(0.019)	(0.017)	(0.026)
Year 2003	-0.021	0.021	-0.042	-0.059	-0.11	0.05	-0.014	0.025	-0.039	0.019	0.379***	-0.361**	-0.005	0.105	-0.111	-0.113***	-0.007	-0.106***
	(0.023)	(0.023)	(0.033)	(0.047)	(0.1)	(0.111)	(0.038)	(0.03)	(0.048)	(0.086)	(0.138)	(0.163)	(0.068)	(0.069)	(0.097)	(0.025)	(0.025)	(0.035)
Year 2005	-0.071***	0.032	-0.105**	-0.075	-0.092	0.017	-0.022	0.067*	-0.089	0.094	0.548***	-0.454**	-0.093	0.071	-0.164	-0.160***	0.006	-0.166***
	(0.027)	(0.029)	(0.041)	(0.064)	(0.141)	(0.155)	(0.055)	(0.037)	(0.066)	(0.109)	(0.188)	(0.218)	(0.089)	(0.085)	(0.123)	(0.031)	(0.029)	(0.042)
Year 2007	-0.094***	-0.016	-0.073	-0.048	-0.047	-0.001	0	0.094*	-0.094	-0.503***	0.161	-0.664**	-0.003	0.071	-0.074	-0.192***	-0.028	-0.164***
	(0.033)	(0.034)	(0.048)	(0.076)	(0.182)	(0.198)	(0.068)	(0.049)	(0.084)	(0.134)	(0.236)	(0.272)	(0.108)	(0.101)	(0.148)	(0.038)	(0.036)	(0.052)
Year 2009	-0.095**	0.041	-0.129**	0.087	-0.099	0.186	-0.038	0.100*	-0.138	-1.426***	-0.469	-0.957***	-0.059	0.115	-0.174	-0.182***	0.024	-0.205***
	(0.039)	(0.04)	(0.057)	(0.095)	(0.222)	(0.242)	(0.078)	(0.059)	(0.098)	(0.172)	(0.291)	(0.338)	(0.133)	(0.122)	(0.18)	(0.045)	(0.043)	(0.062)
Year 2011	-0.228***	-0.032	-0.185***	0.077	-0.139	0.216	-0.142	0.076	-0.218*	-0.813***	0.236	-1.049***	-0.212	0.015	-0.227	-0.310***	-0.042	-0.267***
	(0.043)	(0.046)	(0.065)	(0.11)	(0.265)	(0.287)	(0.096)	(0.069)	(0.119)	(0.185)	(0.341)	(0.388)	(0.155)	(0.142)	(0.21)	(0.051)	(0.049)	(0.07)
Year 2013	-0.207***	0.037	-0.239***	0.066	-0.127	0.193	-0.221**	0.024	-0.245*	-0.301	0.794**	-1.095**	-0.196	0.196	-0.393	-0.338***	-0.013	-0.324***
	(0.049)	(0.051)	(0.072)	(0.125)	(0.304)	(0.328)	(0.105)	(0.079)	(0.132)	(0.211)	(0.392)	(0.445)	(0.179)	(0.16)	(0.24)	(0.059)	(0.055)	(0.081)
Year 2015	-0.215***	0.032	-0.239***	0.057	-0.174	0.231	-0.290**	0.029	-0.319**	-0.582**	0.652	-1.234**	-0.302	0.13	-0.432	-0.342***	0.016	-0.358***
	(0.055)	(0.058)	(0.082)	(0.144)	(0.347)	(0.376)	(0.132)	(0.091)	(0.16)	(0.245)	(0.452)	(0.514)	(0.205)	(0.183)	(0.275)	(0.065)	(0.062)	(0.09)
Year 2017	-0.155**	0.135**	-0.285***	0.051	-0.112	0.163	-0.285**	0.061	-0.345**	-0.544**	0.983*	-1.527***	-0.241	0.394*	-0.635**	-0.344***	0.045	-0.389***
	(0.061)	(0.064)	(0.09)	-0.158	(0.387)	(0.418)	(0.129)	(0.101)	(0.164)	(0.273)	(0.505)	(0.574)	(0.224)	(0.202)	(0.302)	(0.073)	(0.069)	(0.1)
Year 2019	-0.176***	0.163**	-0.337***	0.17	0.141	0.03	-0.310**	0.052	-0.362**	-0.634**	1.005*	-1.638***	-0.069	0.494**	-0.563*	-0.390***	0.05	-0.441***
	(0.067)	(0.071)	(0.099)	(0.176)	(0.428)	(0.463)	(0.147)	(0.111)	(0.184)	(0.294)	(0.558)	(0.631)	(0.248)	(0.223)	(0.334)	(0.08)	(0.076)	(0.11)
Obs.	34377	29066	63443	13262	10611	23873	7464	11359	18823	8734	9451	18185	22181	24246	46427	34568	29163	63731

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals with positive values for each component obtained from the flow of wealth. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses.
Source: longitudinal PSID data

Overall, we do not find a significant variation in EW tenure, as most of the population has positive values of some of its components (Table 2, column 1). As we expected, differences between the HR and LR groups are also not statistically significant. In contrast, it seems that the evolution of economic insecurity is due to the price effect (Table 3, column 1): the value of EW for those individuals classified as HR is lower than in 1999 in all years (except for 2003). This group was already experiencing losses in the value of their resources prior to the Great Recession, although it did not change between 2007 and 2009[13] which, together with the non-significant variation for the LR group, could explain the decrease in economic insecurity in 2009 showed in Figure 3. Their value of EW plummeted in 2011 due to the Great Recession (-23%) and has suffered some volatility during the recovery, with increases in 2013 and 2017 and decreases in 2015 and 2019 which follow the general trend in overall economic insecurity. Conversely, the value of EW for the LR group did not experience significant variations with respect to our reference years until 2017, when EW worth started to rise. This result suggests that less insecure individuals have benefited more from the economic recovery after the Great Recession than the those in the HR group. Because of the diverse evolution of the value of EW, the gap between both groups has been constantly increasing since the financial crisis and up to 33.7% in 2019.

When analysing EW components, we find that neither the holding nor the value of imputed rents corresponding to the main residence have a significant influence on economic insecurity as they have remained steadily constant during the period of analysis (Table 2 and Table 3, columns 2). We may recall that the main residence is not extremely concentrated at the top of the EW distribution, and the flow of imputed rents we obtain is similar for both the HR and LR groups (Figures A7 and A8).

Nevertheless, we do find significant differences between the two groups when we explore the evolution of annual mortgage payments, which could indicate that owning a main residence is not important in shaping economic insecurity but rather having debt related to it and its corresponding amount. In this vein, we observe that the HR group spent less on mortgage than the LR group after the Great Recession (Table 3, column 3), as the gap between them is significant and negative from 2011 to 2019. The HR group

[13] The coefficients shown in Tables 2 and 3 must be interpreted with respect to the reference year, that is 1999. Therefore, the value of EW in 2007 and 2009 was around 9.5% lower than that of 1999, meaning that there is no significant variation between these two periods.

experienced steady declines in the probability of having a mortgage since 2009 due to the credit constraints that prevailed after the collapse of financial markets (Table 2, column 3). This decrease in mortgage payments implied therefore an improvement in the financial situation of HR households who owned mortgage, which could be associated with lower levels of economic insecurity.

The flow derived from non-liquid assets is one of the most important components of well-being explaining differences between the HR and LR groups. The gap between the two groups regarding the probability of owning this type of assets was not significant before the Great Recession as the macroeconomic conditions at that time favoured the acquisition of non-liquid assets for both of them. However, the HR group had a lower probability of owning non-liquid assets compared to the LR group since 2013 (Table 2, column 4). Although we find evidence of some compositional effect, the price effect is even more important: the gap between groups with respect to 1999 has grown steadily over the whole period of analysis (Table 3, column 4). We can observe how LR individuals obtained relative gains from the investment in this kind of assets prior to the financial crisis while the HR group suffered relative losses, widening the gap between the two groups. The difference between the more insecure and the less insecure increased even more with the economic recovery: although the HR group was able to recover some of the suffered losses, the LR group obtained relative gains since 2013 (leading to a gap of 163% in 2019). The LR group was thus able to manage the risk associated with non-liquid assets over this period of high volatility, resulting in lower exposure to objective risk.

Considering the flow of liquid assets, the differences between both groups are not significant in terms of ownership (Table 2, column 5) and only become relevant for 2017 and 2019 in terms of the value of its flow, when the HR group lost 63.5% and 56.3% with respect to 1999 compared to the LR group (Table 3, column 5). Nevertheless, it is also relevant that the probability of having positive savings decreased between 2011 and 2015 for the HR group, which contributed to the overall increase in economic insecurity those years, although they experienced a slight recovery in 2017 that helped to reduce average insecurity.

Finally, we analyse the evolution of the value of family income. We may recall that household income accounts for most of our EW measure and thus its variations are the most important source of economic insecurity. We can observe that individuals in the HR group have lower amounts of income than those in the LR group, and this gap has been constantly rising since 2001 (Table 3, column 6) reaching a 44% in 2019. The value of its family income was already falling before the Great Recession, except for a small recovery in 2009 (compared to the previous year) that was insufficient to offset the large drop in non-liquid assets. The fall for this group was even more pronounced in 2011 (average income for the HR group was 31% lower than the amount in 1999) and continued to decrease despite the economic recovery. In contrast, the LR group only experienced a significant decrease of family income of 6% in 2001, while for the rest of the years it remained practically unchanged compared to 1999 values.

In summary, we find that losses in the value of household income and non-liquid assets are the most important well-being components in shaping the phenomenon of economic insecurity, as they mainly affect those individuals with a high risk of hardship in the future. The imputed rents of the HR group remained constant, while the decrease in mortgage payments could generate opposite effects: the fall in the value of mortgage payments could lead to an increase in well-being, but the decrease in the probability of holding this type of debt could reveal that individuals have restricted access to property and therefore fewer protection mechanisms against distress. Liquid assets do not seem to influence insecurity, as their value has remained constant for this group.

On the other hand, the LR group was able to manage the risk associated with non-liquid assets and obtain gains in the flow of these assets, while their household income did not change significantly. In recent years, this group has experienced a rise in liquid assets, thus increasing their protection mechanisms. Their financial situation was only affected by the increase in mortgage payments before the Great Recession and the lower probability of having positive savings in 2011. Thus, the gap between the two groups in terms of household income and non-liquid assets has been widening especially after the shock of the 2008 financial crisis.

5. Conclusions

In this paper, we propose to measure economic insecurity with a measure of extended well-being that combines income and wealth. We therefore account for the liquid scope of income, but also include all the possible effects that wealth could have on objective insecurity: it can be understood as a short-term protection mechanism, but its reduction could become a source of distress as individuals will have less resources to resort to in case of an economic shock. We construct the joint distribution of income and wealth using the Weisbord and Hansen (1968) approach to estimate all available economic resources that individuals have to face unexpected negative shocks. We then evaluate economic insecurity as the predicted propensity to suffering from a sizable well-being loss to capture the individual vulnerability to future hazards. Furthermore, we study the evolution of economic insecurity in the US over the last two decades and disentangle the potential drivers of this phenomenon by looking into changes of each component of EW.

Our results show that economic insecurity levels are conditioned to the dimension selected for its calculation. The average probability of suffering from EW losses in the US was 33%, whereas this percentage decreases to 22% when considering income and increases to 43% when we take into account wealth. The higher levels of economic insecurity obtained for wealth can be explained by the volatility of asset prices. Thus, our extended measure is able to capture the uncertainty emanating from wealth, which increases the probability of suffering well-being losses compared to the income-based measure. Furthermore, we find that the evolution of economic insecurity based on the EW measure shows a different pattern than that observed for income and wealth. According to EW measure, levels of economic insecurity did not decline during the expansionary period prior to the 2008 financial crisis, whereas the results based on income and wealth show an overall decline in this phenomenon. The collapse of labour and stock markets during the Great Recession increased economic insecurity regardless of the variable used to its calculation. However, our EW measure captures some aspects of economic risk in later periods that income and wealth separately cannot: we find an increase in the probability of EW losses in 2015 due to uncertainty in stock markets, and also in 2019 due to falling household income and declining current accounts and savings.

When analysing potential drivers of economic insecurity, we find that losses in the value of household income and non-liquid assets are the most important well-being components in shaping the phenomenon of economic insecurity, as they mainly affect those individuals with a high risk of hardship in the future. The gap in the value of these resources between high-risk individuals and those with low risk has steadily grown over the whole period of analysis: in 2019, household income of the HR group was 44% lower than that of the LR group with respect to the gap in 1999, whereas this difference reached a 163.4 % in case of non-liquid assets. Mortgage payments may also have played a role in insecurity, as those individuals with high objective risk experience reductions in this kind of debt. On the contrary, liquid assets remained stable for this group and seem to not have a significant impact on insecurity. The LR group was able to manage the risk associated with non-liquid assets and obtained gains in the flow of these assets, while their household income did not change significantly. In recent years, this group has experienced a rise in liquid assets, thus increasing their protection mechanisms.

To our knowledge, this if the first paper that assessed economic insecurity with a joint measure of income and wealth. We are aware that our study has some limitations that we hope to improve in future research. First, the assumptions made to estimate the flow from wealth using the Weisbrod and Hansen (1968) approach may be too strong. Nevertheless, we believe that this is the best approach to estimate the joint distribution of income and wealth, and also that those assumptions do not affect the estimates of economic insecurity, since our purpose is to measure exposure to financial risk and the lack of sufficient protection mechanisms. Second, our procedure cannot capture unpredictable economic shocks that are independent of household characteristics. We would also like to extend the scope of the paper by undertaking a comparative analysis with other countries that also have conducted longitudinal data surveys with information on household income and wealth. However, it is difficult to find surveys with homogeneous variables that can be compared with the PSID data. Finally, further analysis is needed to understand the relationship between economic insecurity and public policies, as the correct measurement of this phenomenon allows policy makers to effectively design targeted ex-ante interventions to prevent future declines in household well-being.

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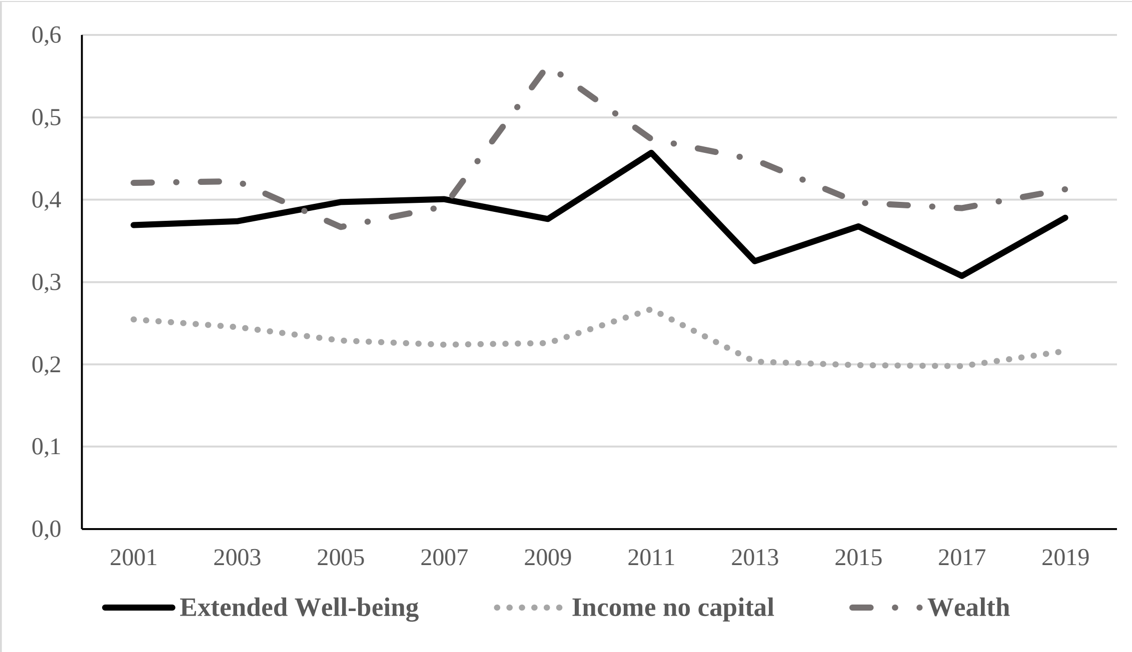
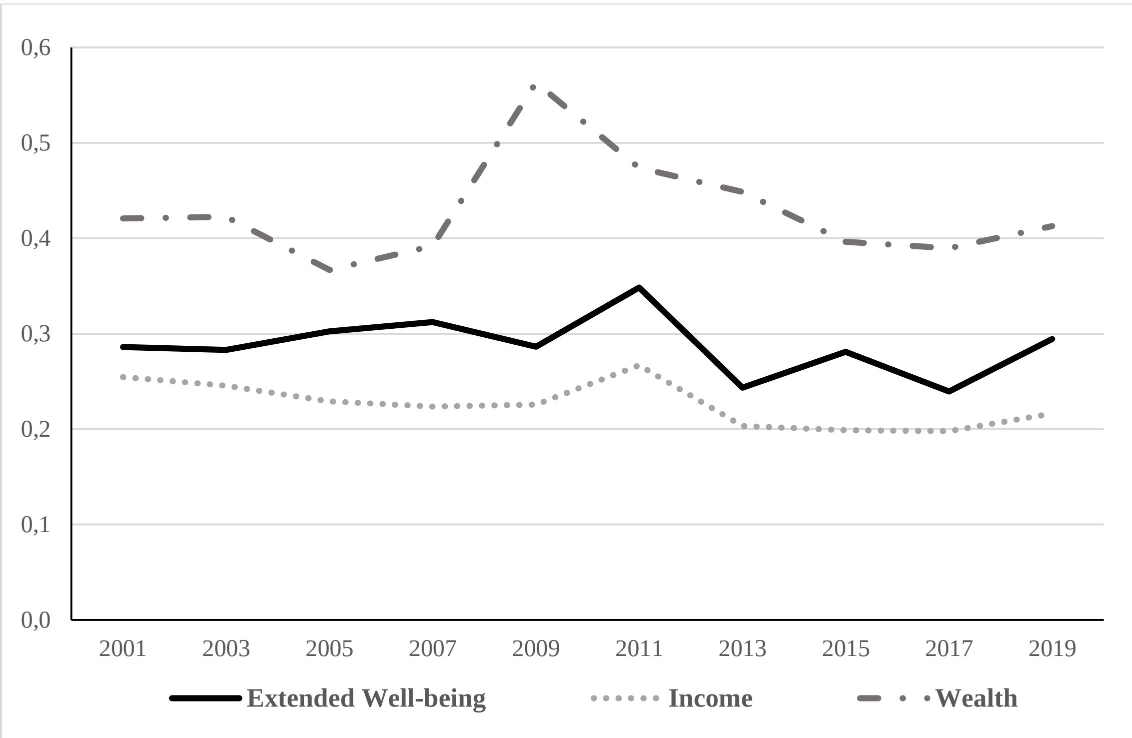
Appendix

FIGURE A1. Average economic insecurity with a threshold of 10% for extended well-being



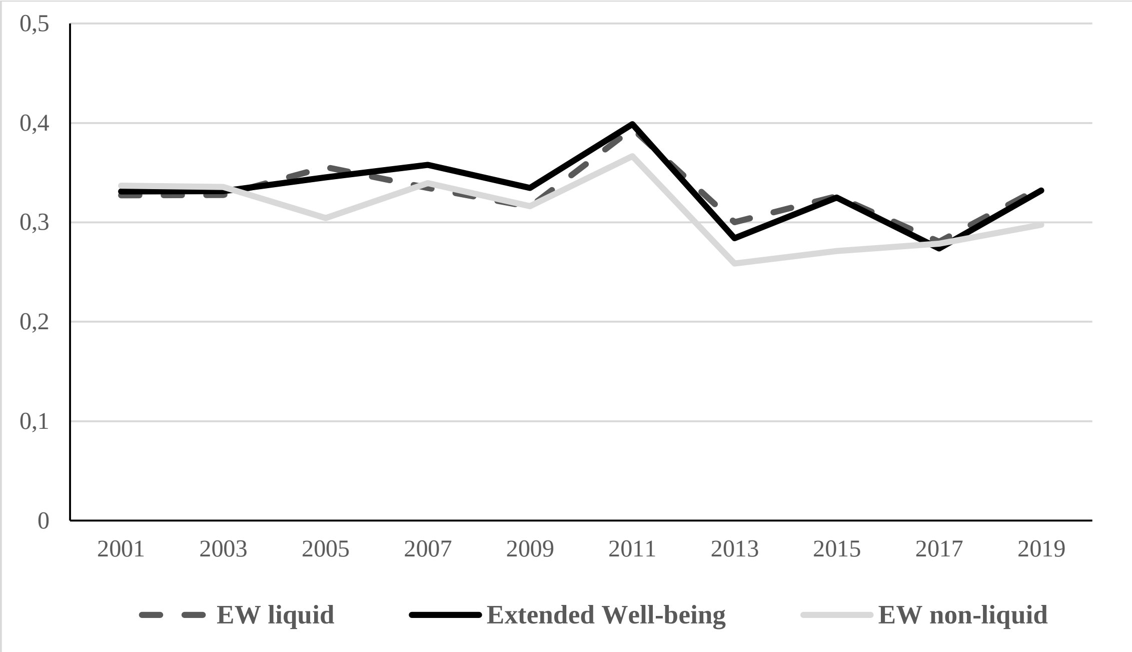
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A2. Average economic insecurity with a threshold of 20% for extended well-being



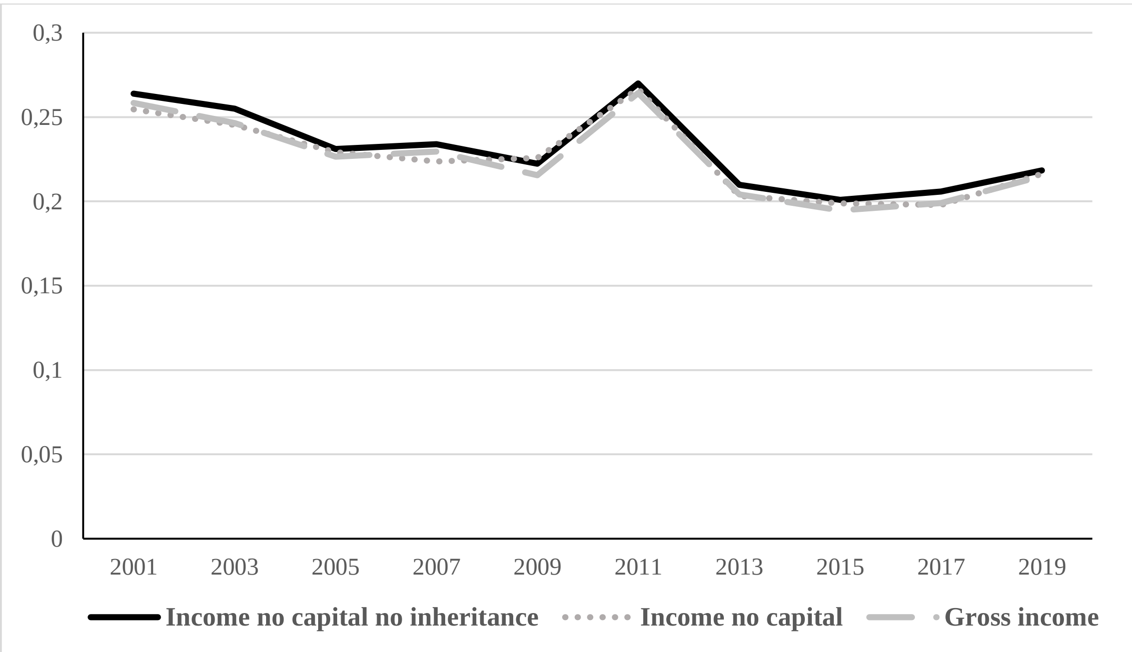
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A3. Average economic insecurity using different definitions of EW



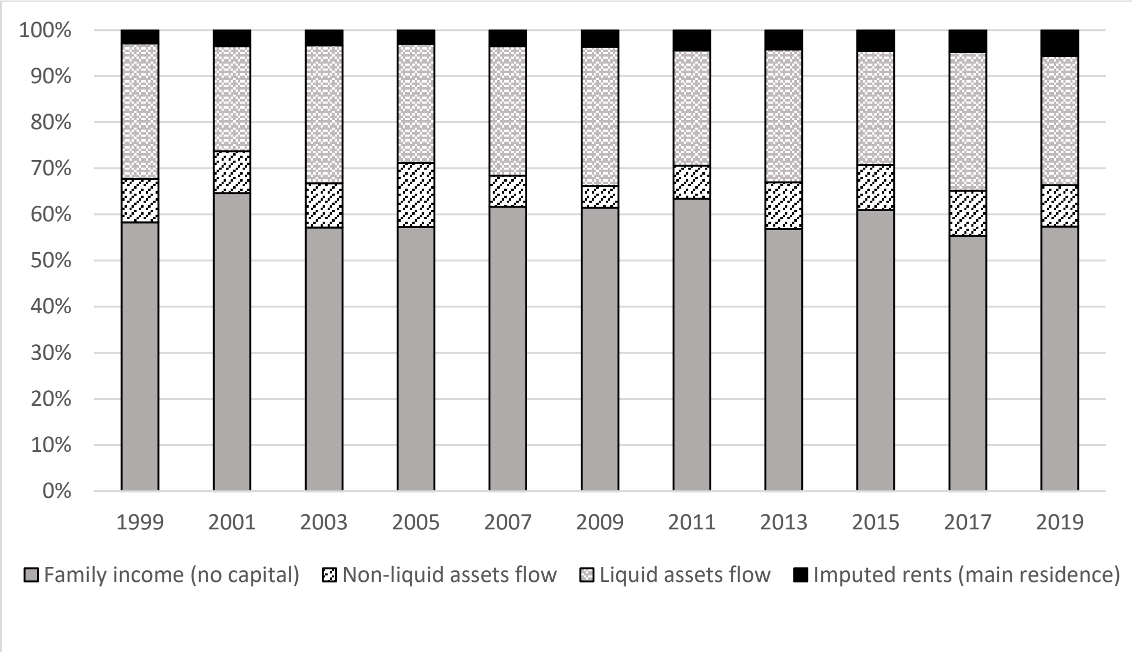
Source: Author's calculations based on PSID data set using cross-sectional weights. Note: EW liquid includes family income (no capital) and liquid assets. EW non-liquid includes family income (no capital) and the flow from non-liquid assets.

FIGURE A4. Average economic insecurity using different definitions of income



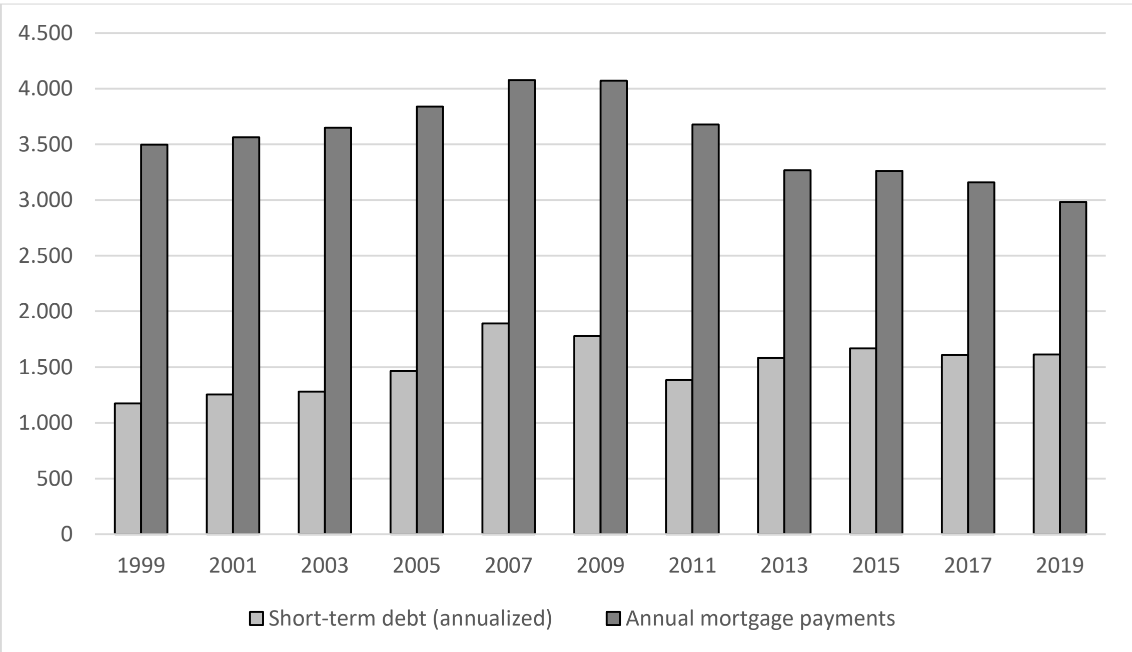
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A5. Weight of different sources in extended well-being



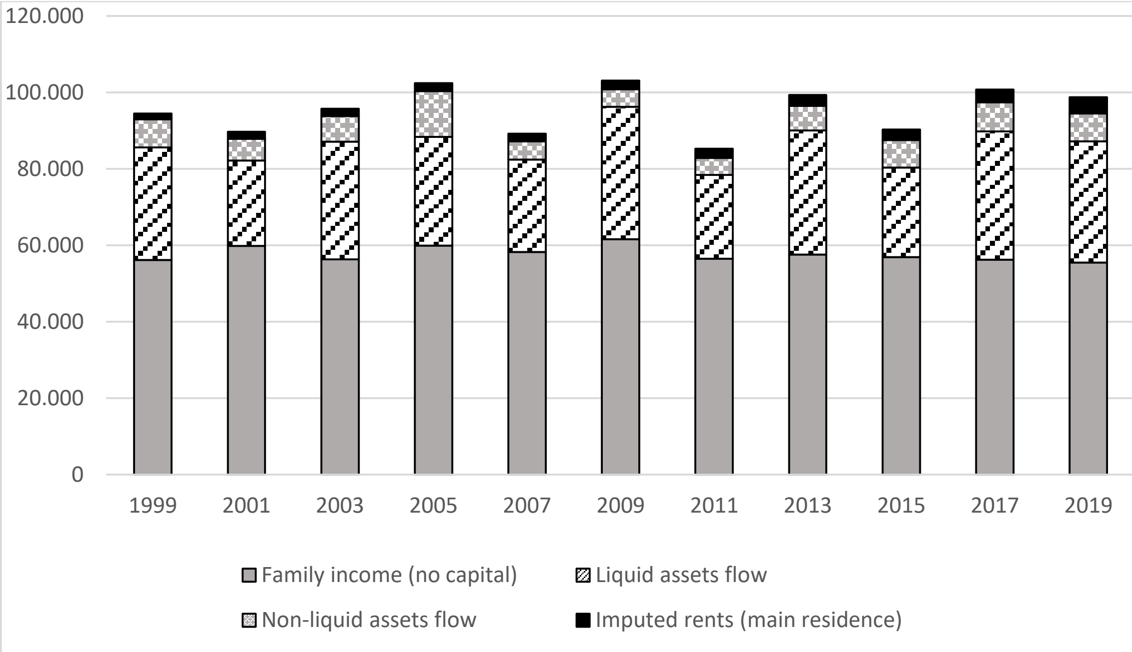
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A6. Evolution of annual average mortgage payments and short-term debts (annualized)



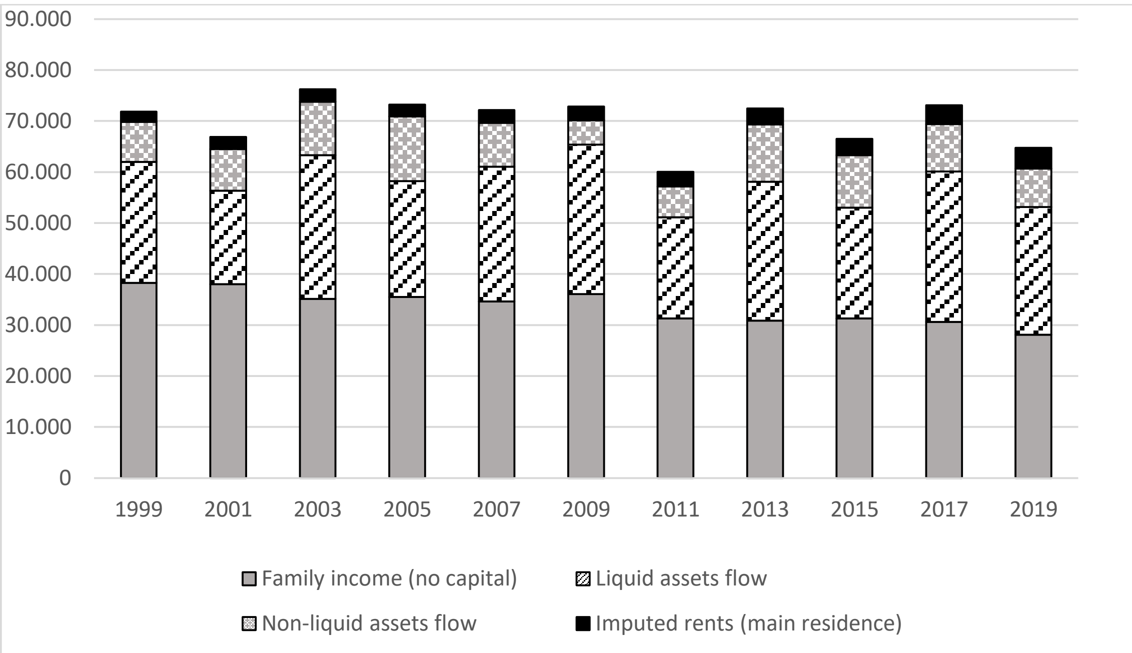
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A7. Average extended well-being of more protected group by sources and year.



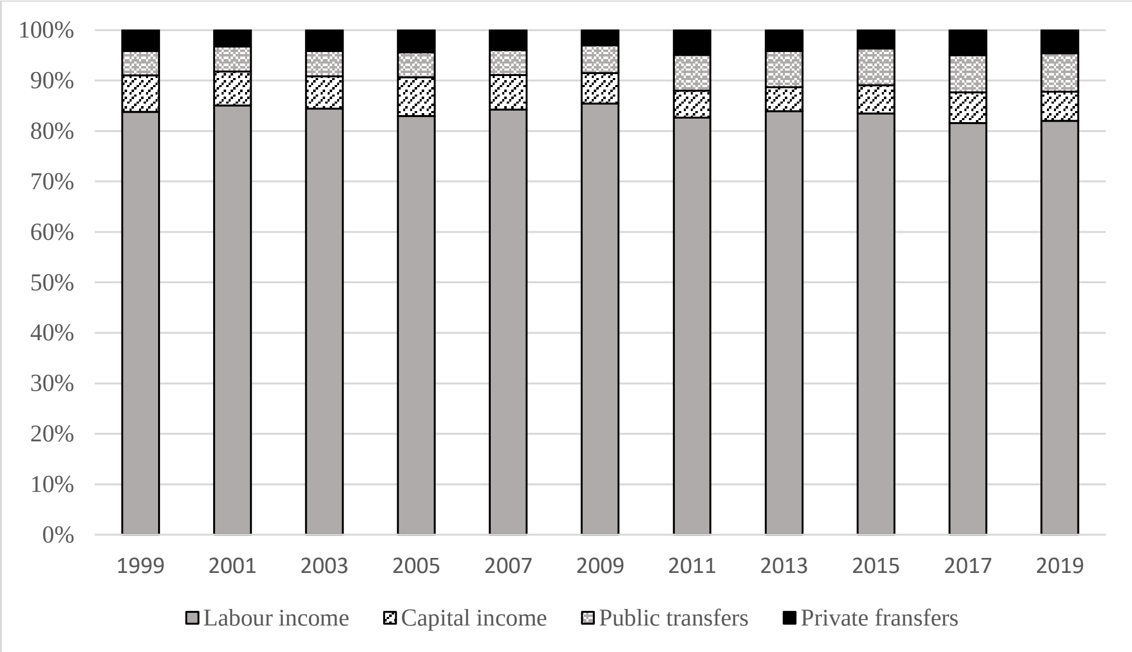
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A8. Average extended well-being of less protected group by sources and year.



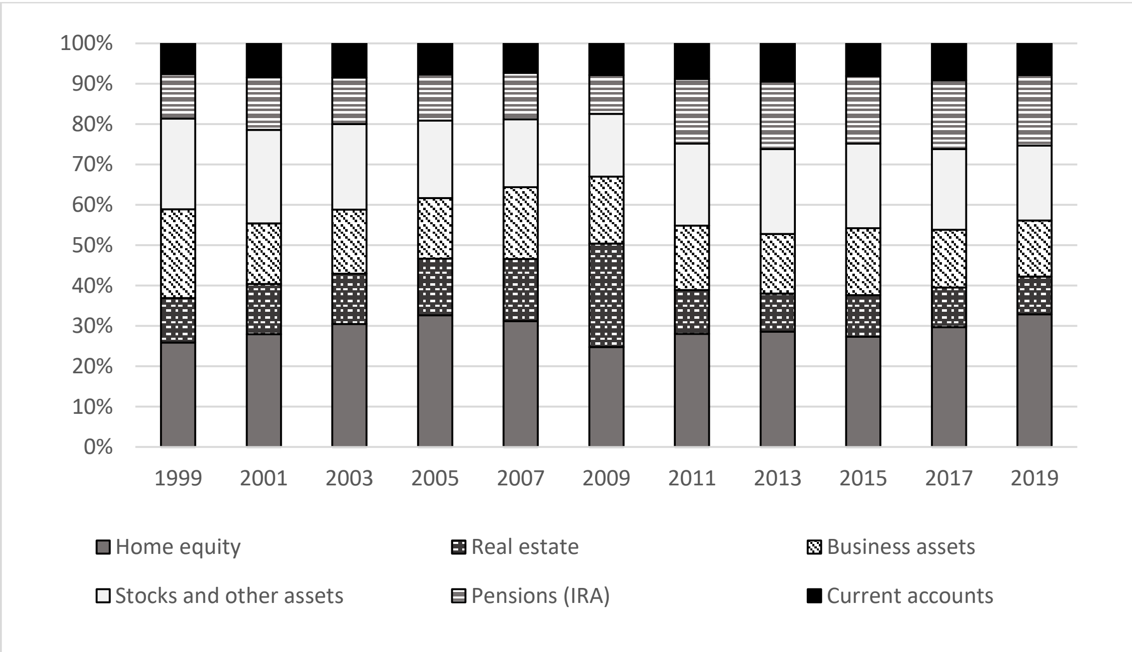
Source: Author's calculations based on PSID data set using cross-sectional weights

FIGURE A9. Weight of different sources in family income



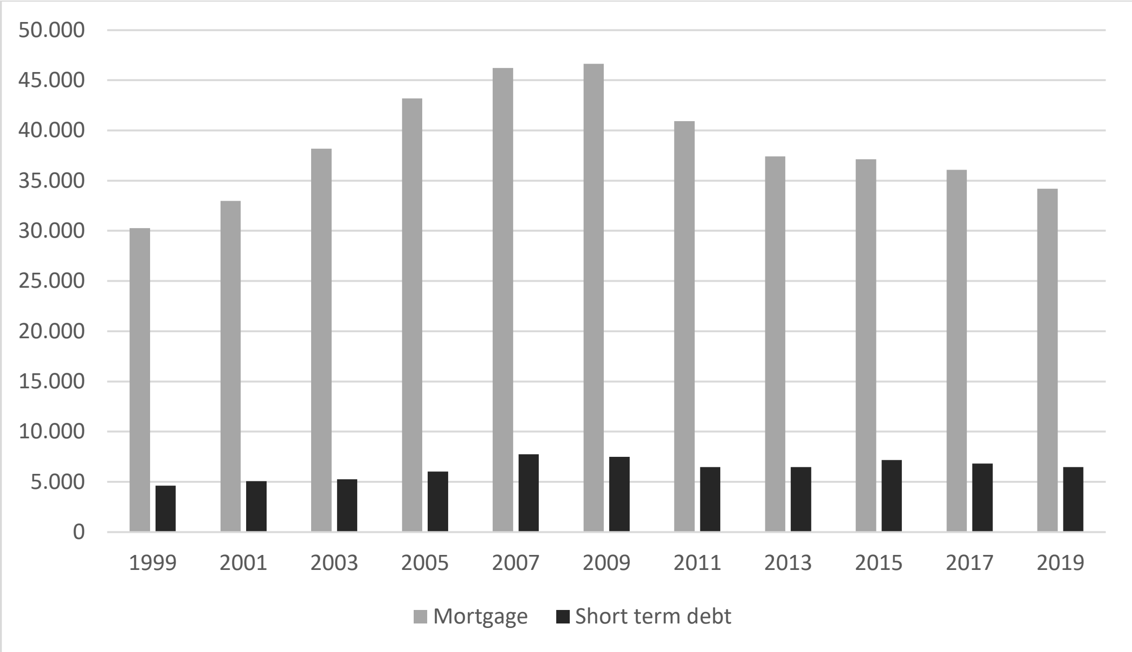
Source: Author’s calculations based on PSID data set using cross-sectional weights

FIGURE A10. Weight of different sources in net wealth



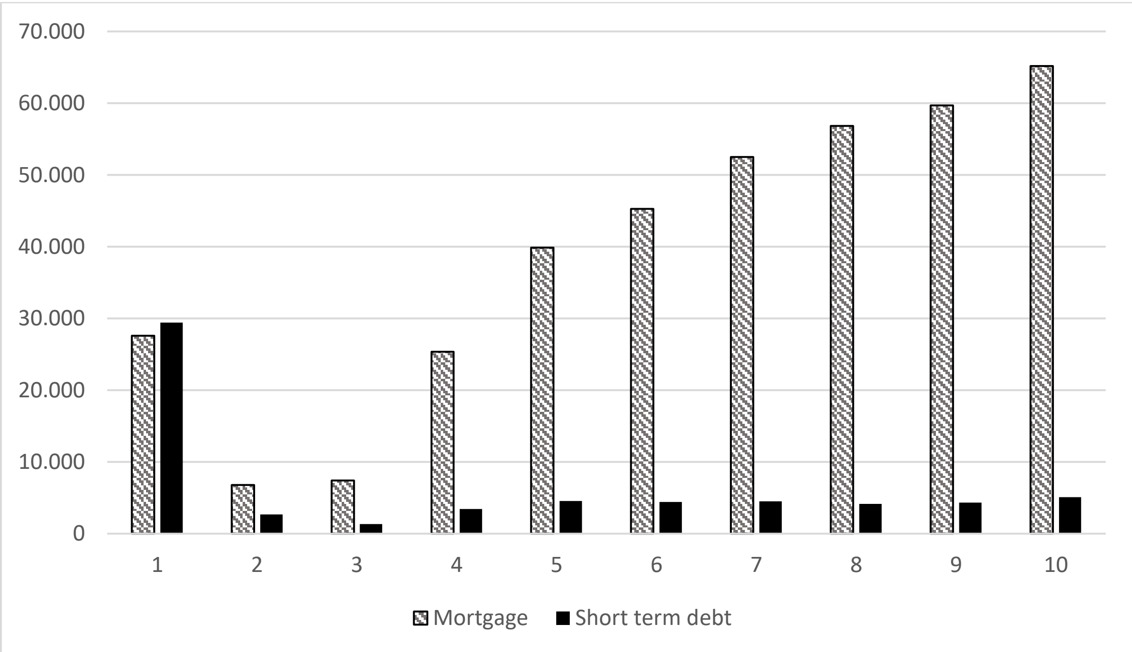
Source: Author’s calculations based on PSID data set using cross-sectional weights

FIGURE A11. Evolution of debt type by year



Source: Author’s calculations based on PSID data set using cross-sectional weights

FIGURE A12. Evolution of debt type by wealth decile



Source: Author’s calculations based on PSID data set using cross-sectional weights

TABLE A1. Definition of total extended well-being

Definition	Net variables
Total income	Labour income + Public transfers + Private transfers
Liquid assets	Total income + Current and savings accounts + Flow from stocks and other assets - Flow from total debt (other debt + medical debt + student loans + card debt)
Non-liquid assets	Liquid assets + Flow from net Real estate + Flow from net Business assets + Flow from private pension assets (IRA)
Imputed rents	Real estate well-being + Gross imputed rents - Annual mortgage payments
Total extended well-being	Total income + Liquid assets +Non-liquid assets +Imputed rents

Source: Author's construction using the PSID database.

Notes: We define income as the sum of labour income (wages and self-employment income from running a household business or any other professional activity), capital income (business profits, dividends, rents or trust funds) public transfers (such as social security transfers or unemployment benefits, among others), and private transfers (transfers from relatives or inheritance) of all household members. On other hand, total household wealth is constructed as the sum of seven asset classes minus their corresponding debt. The asset variables considered are home equity, farm and business assets, checking and savings, other real estate (second home, land, rental real estate), stocks, other assets (such as life insurance), and Individual Retirement Accounts (IRAs) annuities. It must be noted that debt was reported in the database as a single total value until 2007. Since 2009, debt is calculated as the sum of the total debt from farm or business holding, real estate, credit cards and various loans (student, medical, legal, family or other). Moreover, for 2003 and 2005 observations where real estate (other than the main residence) equals one, as well as some outliers in the values reported for business assets, mortgage payments, card debt and medical debt are removed.

Table A2. Trends in asset ownership (flow) of those with higher/lower probability of being insecure based on insecurity levels in 2001

	P(EW>0)			P(Imputed>0)			P(Mortgage>0)			P(Non-liquid>0)			P(Liquid Assets>0)		
	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0.004	0.004	0	0.002	-0.012	0.014	-0.008	0.013	-0.021	0.017	0.025*	-0.008	-0.021**	-0.006	-0.015
	(0.003)	(0.024)	(0.004)	(0.01)	(0.013)	(0.016)	(0.009)	(0.012)	(0.015)	(0.011)	(0.014)	(0.017)	(0.01)	(0.01)	(0.014)
2003	0.002	0.003	-0.001	-0.019	0.003	-0.022	-0.01	0.008	-0.018	0.024*	0.039**	-0.016	-0.004	-0.005	0
	(0.004)	(0.003)	(0.005)	(0.013)	(0.018)	(0.022)	(0.012)	(0.019)	(0.022)	(0.012)	(0.017)	(0.021)	(0.012)	(0.014)	(0.019)
2005	0.003	0	0.003	-0.031**	-0.008	-0.023	-0.002	-0.002	0.001	0.026*	0.041*	-0.015	-0.016	-0.002	-0.014
	(0.004)	(0.003)	(0.005)	(0.016)	(0.023)	(0.028)	(0.015)	(0.026)	(0.03)	(0.015)	(0.021)	(0.026)	(0.015)	(0.017)	(0.023)
2007	-0.001	0.001	-0.002	-0.042**	-0.018	-0.024	-0.030*	-0.002	-0.028	0.036**	0.022	0.014	-0.003	0.003	-0.006
	(0.005)	(0.004)	(0.006)	(0.018)	(0.029)	(0.034)	(0.017)	(0.034)	(0.038)	(0.017)	(0.026)	(0.031)	(0.018)	(0.021)	(0.028)
2009	0	0.002	-0.001	-0.046**	-0.001	-0.045	-0.027	-0.008	-0.02	0.005	0.018	-0.014	0	0.002	-0.002
	(0.005)	(0.004)	(0.007)	(0.021)	(0.035)	(0.041)	(0.02)	(0.041)	(0.045)	(0.019)	(0.031)	(0.036)	(0.02)	(0.026)	(0.033)
2011	0.001	0.004	-0.003	-0.049*	0.01	-0.058	-0.045**	-0.012	-0.033	-0.026	-0.017	-0.01	-0.071***	-0.033	-0.038
	(0.006)	(0.004)	(0.007)	(0.025)	(0.041)	(0.048)	(0.022)	(0.048)	(0.053)	(0.022)	(0.036)	(0.042)	(0.024)	(0.03)	(0.038)
2013	0	0.005	-0.006	-0.029	0.023	-0.052	-0.066***	-0.03	-0.037	-0.026	-0.025	-0.001	-0.067**	-0.023	-0.043
	(0.007)	(0.004)	(0.008)	(0.027)	(0.047)	(0.054)	(0.025)	(0.056)	(0.062)	(0.024)	(0.041)	(0.047)	(0.028)	(0.034)	(0.044)
2015	0.003	0.005	-0.002	-0.01	0.012	-0.022	-0.055**	-0.039	-0.016	-0.031	-0.043	0.011	-0.046	-0.013	-0.033
	(0.009)	(0.004)	(0.01)	(0.03)	(0.053)	(0.061)	(0.028)	(0.063)	(0.069)	(0.027)	(0.046)	(0.053)	(0.031)	(0.039)	(0.05)
2017	0.007	0.006	0	-0.009	0.059	-0.069	-0.065**	-0.047	-0.018	-0.03	-0.056	0.026	0.056*	0.072*	-0.016
	(0.009)	(0.005)	(0.01)	(0.034)	(0.059)	(0.068)	(0.031)	(0.071)	(0.078)	(0.03)	(0.051)	(0.06)	(0.034)	(0.043)	(0.055)
2019	-0.003	0.002	-0.005	0.011	0.097	-0.087	-0.070**	-0.062	-0.008	-0.02	-0.048	0.029	0.025	0.036	-0.011
	(0.01)	(0.005)	(0.011)	(0.038)	(0.065)	(0.075)	(0.034)	(0.079)	(0.086)	(0.033)	(0.057)	(0.066)	(0.038)	(0.048)	(0.061)
Sample Size	22277	19236	41513	22277	19236	41513	22277	19236	41513	22277	19236	41513	22277	19236	41513

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses. Source: longitudinal PSID data.

Table A3. Trends in the flow from asset values and family income of those with higher/lower probability of being insecure based on insecurity levels in 2001

	Log of positive EW			Log of positive imputed rents			Log of positive Mortgage			Log of non-liquid assets			Log of positive liquid assets			Log of positive income		
	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	-0.051**	0.02	-0.071**	-0.072	-0.026	0.046	0.018	0.062**	0.044	-0.05	0.214**	-0.264**	-0.296***	-0.315***	0.02	-0.015	0.064***	-0.080***
	(0.022)	(0.022)	(0.028)	(0.065)	(0.034)	(0.073)	(0.025)	(0.027)	(0.036)	(0.071)	(0.105)	(0.127)	(0.059)	(0.056)	(0.081)	(0.021)	(-0.018)	(0.027)
2003	-0.014	0.03	-0.043	-0.156*	-0.07	0.086	0.005	0.049	0.044	-0.067	0.441**	-0.508***	-0.01	0.083	-0.094	-0.099***	-0.008	-0.090**
	(0.025)	(0.025)	(0.035)	(0.095)	(0.049)	(0.107)	(0.041)	(0.041)	(0.058)	(0.09)	(0.174)	(0.196)	(0.073)	(0.077)	(0.106)	(0.027)	(0.028)	(0.039)
2005	-0.054*	0.024	-0.078*	-0.133	-0.140**	-0.007	0.024	0.073	0.049	0.008	0.576**	-0.568**	-0.081	0	-0.081	-0.123***	-0.02	-0.103**
	(0.03)	(0.034)	(0.045)	(0.132)	(0.068)	(0.149)	(0.054)	(0.06)	(0.081)	(0.12)	(0.243)	(0.271)	(0.098)	(0.1)	(0.14)	(0.033)	(0.037)	(0.05)
2007	-0.068*	-0.001	-0.067	-0.192	-0.03	0.162	0.048	0.12	0.072	-0.546***	0.159	-0.705**	-0.002	0.005	-0.008	-0.164***	-0.009	-0.155**
	(0.036)	(0.041)	(0.054)	(0.171)	(0.081)	(0.189)	(0.074)	(0.074)	(0.104)	(0.135)	(0.316)	(0.344)	(0.118)	(0.125)	(0.172)	(0.042)	(0.045)	(0.062)
2009	-0.066	0.026	-0.092	-0.22	0.055	0.275	0.031	0.12	0.089	-1.480***	-0.475	-1.005**	-0.016	0.044	-0.06	-0.133***	-0.007	-0.126*
	(0.043)	(0.049)	(0.066)	(0.208)	(0.102)	(0.232)	(0.091)	(0.085)	(0.124)	(0.178)	(0.393)	(0.432)	(0.147)	(0.153)	(0.212)	(0.049)	(0.056)	(0.075)
2011	-0.177***	-0.088	-0.089	-0.263	0.001	0.264	-0.018	0.066	0.084	-0.847***	0.241	-1.088**	-0.123	-0.161	0.038	-0.227***	-0.093	-0.134
	(0.048)	(0.057)	(0.075)	(0.248)	(0.119)	(0.275)	(0.109)	(0.104)	(0.15)	(0.191)	(0.467)	(0.504)	(0.17)	(0.18)	(0.248)	(0.056)	(0.065)	(0.086)
2013	-0.140**	-0.013	-0.127	-0.301	0.014	0.314	-0.048	-0.019	0.03	-0.405*	0.839	-1.244**	-0.136	0.012	-0.148	-0.237***	-0.076	-0.161
	(0.055)	(0.065)	(0.085)	(0.285)	(0.134)	(0.314)	(0.126)	(0.115)	(0.171)	(0.22)	(0.541)	(0.584)	(0.194)	(0.207)	(0.283)	(0.066)	(0.075)	(0.099)
2015	-0.172***	-0.045	-0.127	-0.371	-0.023	0.348	-0.063	-0.075	-0.012	-0.655***	0.622	-1.277*	-0.319	-0.07	-0.249	-0.237***	-0.064	-0.173
	(0.062)	(0.074)	(0.096)	(0.325)	(0.155)	(0.36)	(0.146)	(0.15)	(0.209)	(0.25)	(0.622)	(0.67)	(0.226)	(0.236)	(0.327)	(0.073)	(0.083)	(0.11)
2017	-0.102	0.043	-0.145	-0.441	0.005	0.446	-0.052	-0.003	0.049	-0.707**	1.063	-1.770**	-0.134	0.178	-0.312	-0.250***	-0.062	-0.188
	(0.067)	(0.082)	(0.106)	(0.363)	(0.168)	(0.4)	(0.164)	(0.14)	(0.216)	(0.283)	(0.696)	(0.751)	(0.243)	(0.265)	(0.36)	(0.08)	(0.095)	(0.124)
2019	-0.121	0.003	-0.123	-0.247	0.091	0.338	-0.065	-0.048	0.017	-0.797**	0.964	-1.761**	-0.008	0.167	-0.175	-0.288***	-0.116	-0.172
	(0.076)	(0.091)	(0.119)	(0.399)	(0.19)	(0.442)	(0.181)	(0.162)	(0.243)	(0.311)	(0.77)	(0.831)	(0.268)	(0.293)	(0.398)	(0.09)	(0.104)	(0.137)
Sample Size	21913	19111	41024	9055	9631	18686	9296	5382	14678	6530	7903	14433	15167	16080	31247	21998	19113	41111

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses.
Source: longitudinal PSID data

Table A4. Trends in asset ownership (flow) of those with higher/lower probability of being insecure based on insecurity levels in 2009

	P(EW>0)			P(Imputed>0)			P(Mortgage>0)			P(Non-liquid>0)			P(Liquid Assets>0)		
	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0.016***	0.003	0.013**	0.016	-0.01	0.025	-0.012	-0.002	-0.01	0.02	-0.002	-0.003	-0.009	0.023**	0.005
	(0.006)	(0.024)	(0.006)	(0.017)	(0.011)	(0.02)	(0.014)	(0.01)	(0.017)	(0.019)	(0.01)	(0.022)	(0.017)	(0.011)	(0.019)
2003	0.021***	0.001	0.019***	0.033	-0.015	0.048*	-0.015	-0.012	-0.003	0.01	-0.012	-0.025	-0.001	0.035***	-0.003
	(0.007)	(0.002)	(0.007)	(0.021)	(0.014)	(0.025)	(0.017)	(0.013)	(0.021)	(0.02)	(0.013)	(0.024)	(0.021)	(0.013)	(0.024)
2005	0.015*	0.002	0.013	0.019	-0.026	0.045	-0.02	-0.021	0.001	0.057**	-0.021	0.024	-0.035	0.032**	-0.031
	(0.008)	(0.002)	(0.008)	(0.023)	(0.018)	(0.029)	(0.019)	(0.017)	(0.026)	(0.024)	(0.017)	(0.029)	(0.023)	(0.016)	(0.028)
2007	0.017*	-0.001	0.018**	0.028	-0.045**	0.073**	-0.033	-0.036*	0.004	0.045	-0.036*	0.02	0.013	0.024	0.017
	(0.009)	(0.003)	(0.009)	(0.027)	(0.022)	(0.034)	(0.022)	(0.021)	(0.03)	(0.028)	(0.021)	(0.034)	(0.028)	(0.018)	(0.033)
2009	0.016*	-0.001	0.017*	0.053*	-0.047*	0.100***	-0.049**	-0.04	-0.009	0.035	-0.04	0.023	-0.003	0.012	0
	(0.009)	(0.003)	(0.01)	(0.029)	(0.026)	(0.039)	(0.024)	(0.025)	(0.035)	(0.033)	(0.025)	(0.039)	(0.03)	(0.021)	(0.038)
2011	0.004	0.006*	-0.002	0.058*	-0.043	0.101**	-0.056**	-0.050*	-0.007	0.015	-0.050*	0.029	-0.057	-0.014	-0.003
	(0.011)	(0.003)	(0.012)	(0.035)	(0.03)	(0.046)	(0.026)	(0.029)	(0.039)	(0.037)	(0.029)	(0.045)	(0.035)	(0.025)	(0.044)
2013	0.002	0.006**	-0.004	0.071*	-0.022	0.093*	-0.057**	-0.075**	0.018	0.005	-0.075**	0.028	-0.045	-0.023	0.003
	(0.013)	(0.003)	(0.013)	(0.038)	(0.034)	(0.051)	(0.028)	(0.034)	(0.044)	(0.041)	(0.034)	(0.05)	(0.041)	(0.028)	(0.051)
2015	0.01	0.007**	0.003	0.083**	-0.019	0.102*	-0.063**	-0.080**	0.016	0.017	-0.080**	0.054	-0.023	-0.037	0.022
	(0.014)	(0.003)	(0.014)	(0.04)	(0.039)	(0.056)	(0.03)	(0.038)	(0.048)	(0.046)	(0.038)	(0.056)	(0.046)	(0.031)	(0.058)
2017	0.014	0.008**	0.007	0.079*	0.007	0.072	-0.056*	-0.100**	0.044	0.004	-0.100**	0.041	0.093*	-0.036	0.039
	(0.015)	(0.004)	(0.015)	(0.046)	(0.043)	(0.063)	(0.033)	(0.042)	(0.054)	(0.053)	(0.042)	(0.063)	(0.05)	(0.035)	(0.064)
2019	0.001	0.005	-0.004	0.103**	0.033	0.07	-0.063*	-0.115**	0.052	0.039	-0.115**	0.066	0.059	-0.028	0.041
	(0.017)	(0.004)	(0.017)	(0.052)	(0.048)	(0.07)	(0.037)	(0.047)	(0.06)	(0.057)	(0.047)	(0.069)	(0.056)	(0.039)	(0.071)
Sample Size	13035	37904	50939	13035	37904	50939	13035	37904	50939	13035	37904	50939	13035	37904	50939

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses. Source: longitudinal PSID data.

Table A5. Trends in the flow from asset values and family income of those with higher/lower probability of being insecure based on insecurity levels in 2009

	Log of positive EW			Log of positive imputed rents			Log of positive Mortgage			Log of non-liquid assets			Log of positive liquid assets			Log of positive income		
	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	-0.023	-0.024	0.001	-0.023	-0.069	-0.046	0.03	0.037	0.007	-0.015	0.03	-0.047	-0.257***	0.031	0.104	0.022	0.015	0.007
	(0.036)	(0.022)	(0.04)	(0.046)	(0.063)	(0.078)	(0.021)	(0.044)	(0.049)	(0.119)	(0.021)	(0.138)	(0.1)	(0.071)	(0.111)	(0.036)	(-0.019)	(0.040)
2003	-0.021	-0.014	-0.007	-0.09	-0.076	0.014	0.004	0.069	0.065	0.046	0.004	-0.068	0.001	0.114	0.015	-0.073*	-0.085***	0.012
	(0.041)	(0.023)	(0.047)	(0.065)	(0.091)	(0.111)	(0.032)	(0.064)	(0.072)	(0.144)	(0.032)	(0.175)	(0.128)	(0.1)	(0.144)	(0.043)	(0.031)	(0.053)
2005	-0.078	-0.037	-0.04	-0.119	-0.099	0.02	0.024	0.076	0.052	0.096	0.024	-0.119	-0.132	0.214	-0.055	-0.120**	-0.110***	-0.009
	(0.051)	(0.03)	(0.059)	(0.09)	(0.121)	(0.15)	(0.044)	(0.089)	(0.099)	(0.184)	(0.044)	(0.226)	(0.155)	(0.133)	(0.179)	(0.051)	(0.042)	(0.066)
2007	-0.088	-0.094**	0.006	-0.109	0.009	0.117	0.065	0.082	0.017	-0.655***	0.065	-0.361	0.007	-0.294*	0.093	-0.143**	-0.164***	0.021
	(0.058)	(0.038)	(0.069)	(0.114)	(0.147)	(0.186)	(0.056)	(0.109)	(0.122)	(0.233)	(0.056)	(0.285)	(0.179)	(0.166)	(0.212)	(0.059)	(0.055)	(0.081)
2009	-0.121*	-0.065	-0.056	-0.073	0.088	0.161	0.055	0.06	0.004	-1.758***	0.055	-0.721**	-0.103	-1.037***	-0.013	-0.155**	-0.137**	-0.018
	(0.068)	(0.046)	(0.082)	(0.138)	(0.181)	(0.228)	(0.069)	(0.117)	(0.136)	(0.294)	(0.069)	(0.357)	(0.22)	(0.204)	(0.261)	(0.07)	(0.067)	(0.097)
2011	-0.307***	-0.151***	-0.157*	-0.121	0.105	0.226	0.013	-0.03	-0.043	-1.049***	0.013	-0.619	-0.299	-0.430*	-0.081	-0.367***	-0.209***	-0.158
	(0.078)	(0.053)	(0.094)	(0.164)	(0.209)	(0.265)	(0.082)	(0.152)	(0.172)	(0.312)	(0.082)	(0.391)	(0.262)	(0.237)	(0.309)	(0.079)	(0.079)	(0.112)
2013	-0.212**	-0.123**	-0.089	-0.14	0.079	0.218	-0.04	-0.097	-0.056	-0.533	-0.04	-0.62	-0.17	0.087	-0.023	-0.336***	-0.227**	-0.109
	(0.087)	(0.06)	(0.105)	(0.187)	(0.24)	(0.304)	(0.095)	(0.151)	(0.178)	(0.353)	(0.095)	(0.445)	(0.306)	(0.272)	(0.359)	(0.088)	(0.092)	(0.127)
2015	-0.255**	-0.150**	-0.105	-0.173	0.047	0.22	-0.071	-0.06	0.011	-0.895**	-0.071	-0.751	-0.384	-0.144	-0.141	-0.301***	-0.247**	-0.054
	(0.1)	(0.068)	(0.121)	(0.213)	(0.272)	(0.345)	(0.112)	(0.172)	(0.205)	(0.404)	(0.112)	(0.509)	(0.353)	(0.312)	(0.413)	(0.099)	(0.104)	(0.143)
2017	-0.14	-0.081	-0.059	-0.171	0.084	0.255	-0.046	-0.052	-0.006	-0.936**	-0.046	-1.011*	-0.212	0.075	-0.152	-0.287***	-0.255**	-0.032
	(0.108)	(0.076)	(0.132)	(0.239)	(0.295)	(0.379)	(0.122)	(0.186)	(0.221)	(0.473)	(0.122)	(0.586)	(0.373)	(0.349)	(0.443)	(0.108)	(0.117)	(0.159)
2019	-0.144	-0.107	-0.037	0.025	0.332	0.307	-0.051	-0.15	-0.099	-1.064**	-0.051	-1.038*	-0.194	-0.026	-0.227	-0.310**	-0.308**	-0.002
	(0.121)	(0.084)	(0.147)	(0.264)	(0.331)	(0.423)	(0.135)	(0.22)	(0.258)	(0.494)	(0.135)	(0.626)	(0.414)	(0.386)	(0.492)	(0.121)	(0.129)	(0.177)
Sample Size	12682	37498	50180	15718	4679	20397	13879	2637	16516	2914	13879	15729	7583	12815	36971	12780	37606	50386

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses. Source: longitudinal PSID data.

Table A6. Trends in asset ownership (flow) of those with higher/lower probability of being insecure based on insecurity levels in 2019

	P(EW>0)			P(Imputed>0)			P(Mortgage>0)			P(Non-liquid>0)			P(Liquid Assets>0)		
	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0.010**	0.001	0.009	-0.006	0.003	-0.009	-0.013	0.012	-0.025	0	0.046**	-0.045*	-0.021	0.007	-0.029
	(0.005)	(0.044)	(0.006)	(0.016)	(0.018)	(0.024)	(0.014)	(0.016)	(0.022)	(0.016)	(0.02)	(0.026)	(0.013)	(0.012)	(0.018)
2003	0.010*	-0.003	0.014*	-0.011	0.015	-0.026	-0.024	-0.004	-0.02	0.02	0.038	-0.017	-0.015	0.002	-0.017
	(0.006)	(0.005)	(0.008)	(0.022)	(0.027)	(0.034)	(0.02)	(0.022)	(0.03)	(0.021)	(0.027)	(0.034)	(0.019)	(0.016)	(0.025)
2005	0.009	-0.004	0.012	-0.034	0.032	-0.065	-0.028	-0.016	-0.012	0.023	0.056	-0.033	-0.04	0.013	-0.053*
	(0.008)	(0.004)	(0.009)	(0.028)	(0.035)	(0.045)	(0.027)	(0.029)	(0.04)	(0.027)	(0.034)	(0.044)	(0.025)	(0.018)	(0.03)
2007	0.004	-0.006	0.01	-0.039	0.017	-0.056	-0.055	-0.03	-0.025	0.002	0.057	-0.056	-0.037	0.011	-0.049
	(0.01)	(0.006)	(0.011)	(0.035)	(0.044)	(0.056)	(0.034)	(0.037)	(0.05)	(0.033)	(0.043)	(0.054)	(0.03)	(0.021)	(0.037)
2009	0.007	-0.008	0.015	-0.03	0.021	-0.051	-0.071*	-0.043	-0.027	-0.019	0.044	-0.063	-0.054	0.02	-0.074*
	(0.012)	(0.007)	(0.014)	(0.042)	(0.053)	(0.068)	(0.041)	(0.044)	(0.06)	(0.039)	(0.052)	(0.065)	(0.036)	(0.025)	(0.044)
2011	0.006	-0.001	0.007	-0.028	0.041	-0.069	-0.080*	-0.053	-0.028	-0.039	0.024	-0.063	-0.130***	-0.019	-0.112**
	(0.014)	(0.007)	(0.016)	(0.049)	(0.063)	(0.08)	(0.048)	(0.052)	(0.071)	(0.046)	(0.061)	(0.077)	(0.043)	(0.029)	(0.052)
2013	0.002	-0.001	0.003	-0.001	0.069	-0.07	-0.109**	-0.076	-0.033	-0.061	0.019	-0.08	-0.135***	-0.012	-0.123**
	(0.016)	(0.008)	(0.018)	(0.057)	(0.072)	(0.092)	(0.055)	(0.06)	(0.082)	(0.053)	(0.07)	(0.088)	(0.05)	(0.033)	(0.059)
2015	0.002	-0.002	0.004	-0.005	0.077	-0.082	-0.123**	-0.086	-0.036	-0.063	0.013	-0.076	-0.144**	0.008	-0.152**
	(0.018)	(0.009)	(0.02)	(0.064)	(0.082)	(0.104)	(0.063)	(0.068)	(0.092)	(0.06)	(0.08)	(0.1)	(0.056)	(0.037)	(0.067)
2017	0.007	0	0.007	-0.007	0.123	-0.13	-0.148**	-0.087	-0.061	-0.085	0.019	-0.104	-0.03	0.104**	-0.134*
	(0.02)	(0.01)	(0.023)	(0.072)	(0.091)	(0.116)	(0.07)	(0.076)	(0.103)	(0.067)	(0.089)	(0.111)	(0.062)	(0.041)	(0.075)
2019	0.003	-0.006	0.009	-0.009	0.169*	-0.177	-0.169**	-0.087	-0.082	-0.073	0.043	-0.116	-0.103	0.075*	-0.178**
	(0.022)	(0.011)	(0.025)	(0.079)	(0.1)	(0.128)	(0.077)	(0.083)	(0.114)	(0.074)	(0.098)	(0.123)	(0.069)	(0.044)	(0.082)
Sample Size	24516	21950	46466	24516	21950	46466	24516	21950	46466	24516	21950	46466	24516	21950	46466

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses. Source: longitudinal PSID data.

Table A7. Trends in the flow from asset values and family income of those with higher/lower probability of being insecure based on insecurity levels in 2019

	Log of positive EW			Log of positive imputed rents			Log of positive Mortgage			Log of non-liquid assets			Log of positive liquid assets			Log of positive income		
	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity	Higher probability	Lower probability	Low/High insecurity
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	-0.046	0.009	-0.055	-0.108	0.068	0.176	0.052	-0.015	-0.067	0.225	0.377***	-0.152	-0.386***	-0.335***	-0.052	-0.002	0.053**	-0.055
	(0.029)	(0.022)	(0.038)	(0.09)	(0.072)	(0.115)	(0.044)	(0.044)	(0.062)	(0.15)	(0.104)	(0.183)	(0.086)	(0.078)	(0.116)	(0.03)	(-0.023)	(0.038)
2003	-0.028	-0.012	-0.016	-0.204	0.1	0.304*	0.041	-0.105	-0.147	0.281	0.807***	-0.526*	0.046	0.001	0.045	-0.091*	-0.054	-0.036
	(0.038)	(0.031)	(0.049)	(0.128)	(0.118)	(0.174)	(0.077)	(0.081)	(0.111)	(0.247)	(0.15)	(0.289)	(0.127)	(0.108)	(0.166)	(0.046)	(0.034)	(0.058)
2005	-0.067	-0.009	-0.058	-0.202	0.103	0.305	0.081	-0.153	-0.234	0.502	1.190***	-0.688*	0.121	-0.087	0.208	-0.127**	-0.052	-0.075
	(0.051)	(0.04)	(0.065)	(0.18)	(0.167)	(0.246)	(0.104)	(0.12)	(0.159)	(0.353)	(0.192)	(0.402)	(0.178)	(0.138)	(0.225)	(0.064)	(0.041)	(0.076)
2007	-0.121*	-0.059	-0.062	-0.196	0.264	0.46	0.156	-0.211	-0.367*	-0.068	1.053***	-1.122**	0.205	-0.101	0.306	-0.200**	-0.076	-0.125
	(0.065)	(0.048)	(0.081)	(0.232)	(0.21)	(0.313)	(0.142)	(0.163)	(0.216)	(0.467)	(0.23)	(0.52)	(0.231)	(0.17)	(0.286)	(0.083)	(0.049)	(0.096)
2009	-0.141*	-0.004	-0.138	-0.157	0.378	0.535	0.145	-0.26	-0.405	-0.758	0.570**	-1.328**	0.285	-0.115	0.4	-0.220**	-0.048	-0.172
	(0.081)	(0.056)	(0.099)	(0.28)	(0.26)	(0.382)	(0.176)	(0.199)	(0.266)	(0.576)	(0.276)	(0.638)	(0.285)	(0.209)	(0.353)	(0.101)	(0.06)	(0.118)
2011	-0.267***	-0.093	-0.174	-0.234	0.482	0.716	0.119	-0.344	-0.464	-0.092	1.480***	-1.572**	0.145	-0.237	0.382	-0.332***	-0.120*	-0.212
	(0.094)	(0.066)	(0.115)	(0.334)	(0.31)	(0.456)	(0.21)	(0.237)	(0.317)	(0.693)	(0.323)	(0.764)	(0.337)	(0.248)	(0.418)	(0.119)	(0.068)	(0.137)
2013	-0.245**	-0.021	-0.224*	-0.313	0.563	0.875*	0.065	-0.481*	-0.547	0.513	2.387***	-1.874**	0.275	-0.088	0.363	-0.375***	-0.092	-0.283*
	(0.109)	(0.075)	(0.132)	(0.384)	(0.354)	(0.522)	(0.246)	(0.274)	(0.368)	(0.801)	(0.37)	(0.882)	(0.393)	(0.285)	(0.485)	(0.139)	(0.077)	(0.158)
2015	-0.262**	-0.025	-0.237	-0.334	0.626	0.96	0.081	-0.595*	-0.676	0.388	2.404***	-2.016**	0.251	-0.213	0.465	-0.372**	-0.059	-0.313*
	(0.124)	(0.084)	(0.15)	(0.438)	(0.405)	(0.597)	(0.281)	(0.324)	(0.429)	(0.919)	(0.417)	(1.009)	(0.45)	(0.325)	(0.555)	(0.156)	(0.087)	(0.178)
2017	-0.217	0.091	-0.307*	-0.271	0.674	0.944	0.092	-0.555	-0.646	0.555	3.002***	-2.446**	0.489	-0.016	0.506	-0.401**	-0.019	-0.382*
	(0.139)	(0.093)	(0.167)	(0.489)	(0.456)	(0.669)	(0.316)	(0.352)	(0.473)	(1.032)	(0.475)	(1.135)	(0.505)	(0.363)	(0.621)	(0.177)	(0.097)	(0.201)
2019	-0.255*	0.136	-0.392**	-0.024	0.894*	0.919	0.095	-0.629	-0.723	0.618	3.251***	-2.633**	0.658	0.094	0.565	-0.451**	-0.002	-0.449**
	(0.154)	(0.102)	(0.185)	(0.537)	(0.504)	(0.737)	(0.348)	(0.395)	(0.527)	(1.136)	(0.518)	(1.248)	(0.557)	(0.399)	(0.685)	(0.194)	(0.106)	(0.221)
Sample Size	23983	21671	45654	7697	9138	16835	7999	6164	14163	6110	6586	12696	15771	17301	33072	24136	37606	45884

Notes: *** 99%, ** 95%, * 90% significance level. Each column comes from a different fixed-effects regression. Each regression contains a constant term. The sample includes all panel individuals. Controls for marital status, household size, number of children, type of household, region of residence, race, years of education, an indicator for bad or very bad perceived health of household head, and a quadratic in household head's age are included. Robust standard errors, clustered at the individual level, are in parentheses. Source: longitudinal PSID data.

TABLE A8. Rates of returns for each type of assets

	Real estate	Business assets	Stocks	Other assets	Private pensions	Mortgage rates (real estate)	Personal Loans	Credit cards	Student Loans interest
1999	6.80%	7.10%	22.20%	8.70%	0.80%	8.10%	13.50%	14.80%	-
2001	9.70%	4.30%	-7.50%	-2.40%	1.90%	7.20%	12.60%	13.90%	-
2003	7.10%	8.10%	19.50%	7.50%	5.20%	5.90%	12.00%	12.90%	-
2005	10.60%	14.00%	8.30%	5.10%	3.10%	6.20%	12.00%	14.50%	-
2007	-3.90%	-1.00%	7.20%	1.90%	2.30%	6.20%	12.20%	14.40%	-
2009	-9.60%	-17.10%	17.30%	4.00%	4.30%	5.10%	11.20%	14.40%	-
2011	-2.90%	3.90%	-2.30%	0.20%	1.60%	4.00%	10.40%	12.80%	-
2013	8.70%	10.60%	17.60%	7.10%	3.10%	4.50%	10.20%	12.90%	3.90%
2015	6.10%	5.70%	-1.40%	0.00%	1.00%	4.00%	9.70%	13.70%	4.30%
2017	6.40%	7.40%	14.10%	6.80%	3.10%	4.00%	10.60%	15.00%	4.50%
2019	4.70%	6.20%	18.80%	8.90%	1.50%	3.70%	10.20%	16.90%	4.50%

Source: Author’s calculations based on Financial Accounts of the United States