When It Rains It Drains: Psychological Distress and Household Net Worth

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ABSTRACT

This paper establishes a sizeable negative effect of poor mental health on individuals' net worth. In a representative panel of U.S. households, we find that a one standard deviation (or four unit) increase in Kessler's K6 psychological distress level decreases net worth by 13.2 percent and increases by 5 percent the baseline risk of being in deficit net worth, where levels of debt outstrip the value of assets. Survival analyses further show that psychological distress accelerates the entry into and prolongs the stay in deficit net worth states, as well as increasing the probability of re-entry into deficit. Using a Blinder-Oaxaca decomposition, we find that differences in level of savings, medical debt and labor income predominantly explain the lower net worth and higher likelihood of deficit net worth of individuals with high psychological distress. Our findings highlight the significant longer-term implications of mental health on the net worth of individuals.

1. Introduction

When my illness starts to decline, I lose the ability to organize and deal with everyday tasks. I get confused about when or if I've paid something. I cannot concentrate and eventually I am unable to do anything. When I am like this, I even have a problem with using the telephone, and so cannot call and explain my circumstances, and due to my condition, I do not even have the ability to leave the house in order to talk face to face with someone.

Interview responses, Money and Mental Health Policy Institute (2019a)

I am frequently told to give a power of attorney to a relative to make it easier for the bank. I have capacity and agency but once anxiety kicks in I cannot recall even basic information.

Interview responses, Money and Mental Health Policy Institute (2019b)

Individuals navigate through complex financial decisions under duress. Recent research finds that non-cognitive factors and health conditions play defining roles for individuals' financial portfolio choice decisions, including for the types of investments they hold in their portfolios (Rosen and Wu, 2004; Bogan and Fertig, 2013; 2018; Parise and Peijnenburg, 2019). In this paper, we investigate the risks psychological distress poses for individuals' overall financial health by studying the detrimental effects on net worth over time. Moreover, we assess whether psychological distress makes facing deficit net worth episodes (where total debts owed are greater than the total assets owned) more likely. In this regard, what role does psychological distress play for an individual's duration of stay in deficit states and the length of time it takes to enter, exit or potentially re-enter episodes of deficit net worth? Understanding the drivers of net worth is of critical importance because, in recent years, the preponderance of households either with a low net worth or holding a deficit on their balance sheet is startling. For instance, the bottom 50% of Americans cumulatively have a deficit net worth (Saez and Zucman, 2016).

Being in deficit can be a persistent (Giarda, 2013) or a temporary occurrence for some; however, individuals who experience frequent or persistent deficit net worth episodes face substantial opportunity costs of investments and this can impede optimal portfolio allocations (Davis et al., 2006; Becker and Shabani, 2010). As net worth deteriorates, individuals are unable to use assets to eliminate costly debt from the balance sheets, which further

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negatively affects future financing opportunities and cost of credit. In the long run, while being in deficit does not necessarily imply bankruptcy (if debts can continually be serviced and reduced by cashflows), the stakes for such households are high, as deficit net worth increases the risk of debt delinquency due to the inability to absorb unexpected economic shocks (Gross and Souleles, 2002; Athreya et al., 2019). Prior studies document that individuals with negative net worth delay filing personal bankruptcy (White, 1998; Mikhed et al., 2019). This means that over the long term, individuals persistently in deficit net worth are unable to build their net worth and face substantial financial implications as they approach retirement years.

In light of the above, it becomes vitally important to uncover how mental health affects an individual's net worth. Empirical evidence on the effects of mental health on net worth dynamics can inform policy responses to the recent focus on the economic costs of mental ill-health and the substantial risks when wealth accumulation is impeded (OECD, 2014; 2018). Prior studies document that health status affects the allocation of household financial assets and is an important factor determining households' financial wealth (Berkowitz and Qiu, 2006). Bogan and Fertig (2018) find that individuals suffering from psychological distress are less likely to hold retirement accounts and have proportionately lower retirement savings as a share of financial assets. A separate study by Bogan and Fertig (2013) finds that individuals affected by mental health issues decrease investments in risky instruments, while women diagnosed with psychological disorders increase investments in safe assets. Thus, the significance of building up a positive net worth to be able to absorb future economic shocks, as well as prepare for retirement, renders the quantification of the damaging effects of mental health on individuals' net worth an increasingly important issue.

Psychological distress can interfere with the critical steps one can take toward building net worth over time (see Bogan and Fertig, 2013, for the case of portfolio choice). For instance, the ability to sensibly allocate personal funds to savings or investments can be impeded, either by depleting individuals' cognitive capacities (e.g., ability to budget or set savings goals, Changwony et al., 2021) or by negatively influencing their affective states (such as the motivation to accumulate wealth). In this context, psychological distress acts as a cognitive stressor that impedes individual decision-making processes, which manifests as a reduction in individuals' ability to build their net worth, brought on by high cognitive loads (Agarwal and Mazumder, 2013; Mani et al., 2013; Deck and Jahedi, 2015; Schilbach et al., 2016). Further, individuals' perception of risk, reward and the time value of money can be altered, making them more likely to engage in increased consumption, such as "retail therapy" (Dahal and Fertig, 2013), possibly financed through unsecured borrowing. Moreover, funds available for wealth accumulation can be depressed through decreases in individual productivity and costly expenditures on psychological treatments.

Our empirical analysis relies on a large panel of households observed over the period 2001 to 2019, obtained from the biennial Panel Study of Income Dynamics (PSID) and representative of the U.S. population. We focus on heads of households, whom we track over the sample period. The PSID contains detailed data on household balance sheets, capturing household assets and liabilities at a high level of granularity and allowing measurement of household net worth. Our primary explanatory variable captures the psychological distress of the head of the household based on Kessler's K6 measure of non-specific psychological distress (Kessler et al., 2002), which derives from questions regarding negative emotional states experienced within the 30 days prior to the interview. The scale aggregates responses capturing the emotional states of feeling nervous, hopeless, worthless, restless or fidgety, irremediably sad and that everything is an effort. Its utility lies in its simplicity

and predictive power for depression and anxiety (Furukawa et al., 2003), where, crucially, these two conditions rank among those mental health issues with the highest prevalence in the U.S. population (Kessler et al., 1994). We also use survey information on the level of interference from psychological distress that individuals experience in daily life and activities.

To assess the relationship between psychological distress and net worth, we exploit the panel structure of our biennial survey data that allows for the inclusion of individual fixed effects and time fixed effects to control for important sources of unobserved heterogeneity in all our regression specifications. Our identification approach thus relies on studying the within-variation in individuals' net worth changes over time in response to their ex-ante psychological distress. We also control for a rich array of time-varying covariates, including demographic attributes (education, income, employment status and marital status) and socioeconomic life events (birth of a child, death of a family member, being laid off from work and missing work due to illness).

The main finding that consistently emerges is that psychological distress exerts a strong negative effect on individuals' net worth. Our estimates indicate that a one standard deviation increase in psychological distress, which translates to a rise of 4 units in Kessler's K6 score, is associated with a decrease in net worth of 13.2 percent. These effects are more severe – around 42 percent – for individuals with heightened levels of psychological distress (K6 scores >12) or for those feeling that psychological distress interferes a lot with their daily life. We also find that psychological distress significantly increases individuals' risk of facing deficit (or negative) net worth episodes – the probability increase is estimated to be 5% relative to the average baseline risk in the model. The baseline risk increases by 15-18% for the case of individuals with high levels psychological distress and interference.

Delving deeper into deficit net worth duration using survival analysis, we find significantly lower survival probabilities from deficit states for individuals with psychological distress and the effect remains strong for several years (2 consecutive waves or 4 years). While psychological distress does not explain the probability of exiting deficit net worth, it becomes a strong influencing factor for re-entries into deficit. That is, individuals who have previously experienced periods of deficit net worth are more likely to enter deficit net worth periods again. This indicates significant negative long-term implications for wealth accumulation.

We conduct a Blinder-Oaxaca decomposition to estimate the extent to which psychological distress contributes to explaining the observed differences in (deficit) net worth through the various components in the household financial accounts, namely income, expenses, assets and debts. We draw on the PSID's detailed information on the various financial account components, collected in survey waves since 2011. From the decomposition, we uncover that the largest impact of psychological distress is through liquid assets (or the savings channel), which explains 36.8% of the net worth differences and 24.7% of the deficit probability differences between the individuals with high versus low psychological distress. This means that the effect of heightened mental health problems is observable on individuals' savings behaviors. We also find that, for those with poor mental health, medical debt plays a substantial role in explaining the gap in net worth levels (21%) and gap in deficit net worth probabilities (28%). Similarly important effects are observed via labor income (or the productivity channel), where individuals with high psychological distress have lower labor income as compared to those with low psychological distress. We see that labor income explains 17.7% (8.8%) of the (deficit) net worth gap due to differences in (high versus low) psychological distress.

In important additional analyses, we explore response heterogeneity in the effects of psychological distress based on the socioeconomic status (SES) of individuals. We find that there are no dif-

ferences in the effect of psychological distress on net worth for individuals with different levels of SES. The finding supports the existence of a generalized effect of psychological distress on net worth no matter the strata of the socio-economic status. However, when we examine deficit net worth, we find that individuals with a lower SES have significantly higher probabilities of facing deficit net worth caused by their psychological distress.

Finally, we investigate whether psychologically distressed individuals are more vulnerable to adverse economy-wide shocks, by considering the episode of the Global Financial Crisis. Specifically, measuring psychological distress of individuals before the crisis and assessing net worth of individuals during the crisis period, we find that psychologically distressed individuals have a significantly worse experience of the crisis, with greater negative effects on their net worth. Allowing for spatial heterogeneity in the effects from the Global Financial Crisis, we find that the psychologically distressed living in states highly affected by the crisis experience the greatest depletions in net worth and substantially increased likelihoods of deficit net worth. These heterogeneous effects at the state level emphasize the detrimental effects of psychological distress on net worth during crisis times. Overall, the findings highlight that mental health produces serious negative effects on household balance sheets, with long-term consequences for individuals' ability to build their net worth over time.

2. Data and variables

2.1. Data sample

We obtain data from the biennial Panel Study of Income Dynamics (PSID). The PSID forms a representative sample of individuals in the U.S. population and uses a sampling methodology that collects detailed information from heads of households as well as other household members, including descendants. Created to study the dynamics of income and poverty, the PSID has expanded to collect information on household wealth as well as psychological health. As granular information on individuals' psychological distress levels is elicited since 2001, we concentrate on the ten survey waves covering the period 2001 to 2019 for the analysis. The data capture a rich set of demographic attributes such as education, income, employment status and marital status, and record a battery of indicators of socio-economic life events related to economic shocks. We focus our sample on respondents aged 18 and above with positive family income, and exclude full-time students from our investigation. We require that the same heads of households be observed in two consecutive periods. After collating information of respondents who answer the various survey questions related to the key variables of interest, the mean number of respondents across waves is 6,214 in our sample, with a total of 54,860 respondent-wave observations.

2.2. Measuring net worth

Net worth constitutes an important household summary measure within the PSID, informative of the level of assets and liabilities of the household. In the construction of household net worth, a variety of questions assessing the values of various wealth components (assets and debts) are utilized. The values of assets are calculated after deducting any debts or amounts owed. The components include (i) stocks in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or Individual Retirement Accounts (IRAs); (ii) money in checking or savings accounts, money market funds, certificates of deposit, government savings bonds, or Treasury bills (not including assets held in employer-based pensions or IRAs); (iii) real estate, including main home, second home, land, rental real estate,

or money to be received from a land contract; (iv) part or all of a farm or business; (v) money in private annuities or IRAs; (vi) vehicles such as cars, trucks, motor home, trailer, or boat; (vii) any other savings or assets, such as bond funds, rights in a trust or estate, cash value in a life insurance policy, or a valuable collection for investment purposes; (viii) remaining principal on mortgage(s); and (xi) other debts such as credit card charges, student loans, medical bills, legal bills, or loans from relatives.

2.3. Psychological distress

Psychological distress of respondents is assessed using the K6 non-specific psychological distress scale of Kessler et al. (2002). A set of six questions elicits the respondents' psychological states across a wide range of dimensions. Specifically, respondents rate whether, during the past 30 days, they felt nervous, hopeless, worthless, restless or fidgety, so sad that nothing could cheer them up, or that everything was an effort. The responses relate to the frequency of the symptoms felt on a 5-point Likert scale with five possible answer choices: "all the time", "most of the time", "some of the time", "a little of the time" or "none of the time". The responses to these six questions are mapped to integers ranging from 0 (none of the time) to 4 (all the time). Thus, the higher numbers correspond to an increased experience of the particular symptom. The overall measure of psychological distress is then obtained by summing up the responses to all the above six questions, which yields a measurement with values ranging from 0 to 24.

Since previous studies document that a K6 score greater than 12 indicates that the respondent suffers from high psychological distress (Kessler et al., 2003), we also use this cut-off level to categorize individuals into those with scores greater than 12, in the range 5 - 12 and scores less than 5, and study the net worth effects arising from the different levels of psychological distress.

As an alternative definition, we consider an intensity measure of psychological distress. Specifically, respondents are asked to indicate the degree to which psychological distress feelings interfere with their life and activities. Response choices "a little", "some" and "a lot" are then mapped onto separate indicator variables, with the "not at all" response category constituting the base group. These psychological distress interference levels measure the degree of psychological distress feelings of individuals.

2.4. Sample characteristics

Table 1 displays the sample characteristics for the individuals included in our study and also reports the summary statistics according to deficit net worth.[1] In terms of psychological distress, on average respondents score 3.282 on the K6 scale, while respondents in deficit net worth have an average K6 score of 4.377. This descriptive evidence shows that respondents with deficit net worth report having higher levels of psychological distress, suggesting that deficit net worth is influenced by poor mental health. Further, the PSID asks respondents scoring positive values on the K6 scale how much their feelings of psychological distress interfere with their daily life or activities. The summary statistics for this question reveal that respondents in deficit net worth report higher levels of interference on average, as compared to the sample as a whole. This is particularly marked for those stating that their psychological distress interferes with their daily life or activities "a lot" (11.4% of respondents with deficit net worth, as opposed to 7.8% of the full sample).

The demographic characteristics of the overall sample are similar to those of other PSID studies. However, there are some notable

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[1] We report the correlations between psychological distress, deficit net worth and all the respondent-level characteristics in the Online Appendix.

Table 1
Sample summary statistics The table reports summary statistics of the variables for our full sample and for those in deficit net worth. Exact definitions of the variables are provided in Appendix A.

	Full sample		Deficit net worth	
	Mean	SD	Mean	SD
Panel A: Psychological distress				
Psychological distress	3.282	3.952	4.377	4.542
Number of observations	54860		7166	
Panel B: Psychological distress interference in daily life and activities				
Psychological distress interference:				
Not at all	0.469	0.499	0.401	0.490
A little	0.298	0.457	0.315	0.464
Some	0.155	0.362	0.170	0.376
A lot	0.078	0.269	0.114	0.318
Number of observations	23866		3840	
Panel C: Individual characteristics and socio-economic life events				
Education	13.162	2.626	13.293	2.528
Income ('000s)	66.362	58.881	46.353	37.590
Net worth	8.240	7.887	-10.101	1.548
Employed	0.732	0.443	0.766	0.424
Married	0.517	0.500	0.344	0.475
Divorced	0.147	0.354	0.177	0.382
Socio-economic life events:				
Birth of child	0.121	0.326	0.146	0.354
Death of a family member	0.019	0.135	0.013	0.113
Lay off	0.050	0.218	0.061	0.239
Missed work with illness	1.107	3.658	1.422	4.011

differences in the individual- and household-level demographics between the sample as a whole and the subsample of respondents in deficit net worth. Respondents in deficit net worth have a lower average household income of $46,353, as opposed to $66,362 for the sample as a whole. Moreover, 77% of those in deficit net worth are employed, which is a slightly higher proportion than for the sample as a whole (73%). Further, a lower percentage of individuals in deficit net worth are married as compared to the full sample (34.4% vs. 51.4%) and a higher percentage divorced (17.7% vs. 14.7%).

Additionally, the PSID captures information on whether the respondents have experienced the different socio-economic life events of birth of a child, death of a family member, being laid off from work, and the number of weeks of work respondents missed due to illness. These events can significantly influence individuals' financial positions and, consequently, net worth. The descriptive statistics reveal that on average respondents entering deficit net worth exhibit more occurrences of these socio-economic life events, as compared to those not entering deficit net worth. Importantly, respondents in the sample as a whole missed around 1.11 weeks of work on average, while the figure rises to 1.42 weeks for respondents in deficit net worth.

Bivariate correlations are shown in the Online Appendix Table A1. As expected, there is a positive correlation between psychological distress and deficit net worth. Likewise, the psychological distress score is positively correlated with any degree of interference (a little, some or a lot) with daily life and negatively correlated with no interference. In terms of individual characteristics, education, income, employment and married are all negatively correlated with psychological distress, while divorced is positively correlated. We find that those who are educated and employed are more likely to face deficit net worth episodes (perhaps because they have better access to credit), and less likely to experience psychological distress. When we study the different socio-economic life events – birth of a child, death of a family member, being laid off, and weeks of work missed due to illness – except for the death of a family member, which can lead to bequests, every other life event is positively correlated with deficit net worth. Further, with the exception of the birth of a child, every other life event

is positively correlated with psychological distress, with those who experienced death of a family member reporting higher levels of psychological distress interference with daily life.

3. Baseline empirical results

3.1. Psychological distress and net worth effects

We assess whether psychological distress exerts negative effects on individuals' net worth. Related papers highlight the crucial role of identifying the relationship between mental health and economic outcomes to facilitate effective policy responses (Bridges and Disney, 2010; Gathergood, 2012; Bogan and Fertig, 2013; 2018). Our main source of identification originates from using past measurements of psychological distress to study the within variation in next-period net worth realizations, with individual and time fixed effects entering the various regression models. Exploiting the biennial survey timing of our data makes it unlikely that these suffer from expectation bias. Specifically, our baseline empirical model is as follows:

$$NetWorth_{i,t+1} = \alpha_i + \zeta_{t+1} + \beta PsyDistress_{i,t} + X'_{i,t}\theta + \varepsilon_{i,t+1}, \quad (1)$$

for $i = 1, \ldots, N$ respondents and $t = 1, \ldots, T$ survey waves. Individual (α_i) and time (ζ_{t+1}) fixed effects capture unobserved time-invariant heterogeneity and common cross-sectional shocks. The dependent variable is net worth normalized by applying the inverse hyperbolic sine (IHS) transformation, which is near-logarithmic and also defined for negative values (Pence, 2006). The normalization enables us to account for negative values and skewness in net worth. $PsyDistress_{i,t}$ is our main explanatory variable of interest, which captures respondents' levels of psychological distress. We consider three alternative definitions for psychological distress in the various regressions, which are defined in Section 2.3. The vector of control variables $X_{i,t}$ accounts for time-varying individual- and household-level attributes, including education, income, employment status and marital status, as well as socio-economic life circumstances and events, including birth of a child, death of family member, being laid off from work and number of working weeks missed due to illness. Definitions of all the variables are provided in Appendix A. All standard errors are clustered at the individual level.

Table 2 reports in Columns (1)-(3) the OLS estimation results for the net worth regressions. We find that psychological distress, as measured by individuals' composite K6 scores, has a statistically significant loading of -0.141, which translates to a decrease in next-period net worth of 13.2 percent. When we consider subgroups of individuals with heightened levels of psychological distress (K6 scores greater than 12) or for those feeling that psychological distress interferes a lot with their daily life, we find that such individuals experience net worth declines of around 42 percent.

To understand the effects more deeply, we examine individuals' probability of facing deficit net worth states due to psychological distress. We use a similar multivariate framework to above, which accounts for the set of time-varying covariates and fixed effects. Specifically, we estimate the following linear probability model:

$$DeficitNetWorth_{i,t+1} = \alpha_i + \zeta_{t+1} + \beta PsyDistress_{i,t} + X'_{i,t}\theta + \varepsilon_{i,t+1}, \quad (2)$$

for $i = 1, \ldots, N$ respondents and $t = 1, \ldots, T$ survey waves. The dependent variable is an indicator for a respondent's net worth being negative, scaled by 100 for ease of interpretation as percentages. All the other specification details remain identical to Equation (1). With individual fixed effects modeled in the regressions, the coefficient estimates provide the interpretation of individuals transiting in and out of deficit net worth states. Table 2 reports the results in Columns (4)-(6). We find that psychological distress signif-

Table 2

Effect of psychological distress on net worth and deficit net worth The table reports estimates of linear fixed effects regressions in which the dependent variable in Columns (1)-(3) is net worth (IHS transformed), while in Columns (4)-(6) it takes the value 100 if the respondent is in deficit net worth, and zero otherwise. The key explanatory variables are the psychological distress score; psychological distress indicator variables capturing the levels <5, 5 - 12 or >12; and the psychological distress interference measures. Controls include demographic attributes and socio-economic life events, exact definitions of which are provided in Appendix A. Individual and time fixed effects are included, where time runs at a biennial frequency spanning the years 2001-2019. Standard errors are included in parentheses and clustered at the respondent level. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

	Net worth			Deficit net worth		
	(1)	(2)	(3)	(4)	(5)	(6)
Psychological distress	-0.141***			0.650***		
	(0.043)			(0.215)		
Psychological distress (5 - 12)		-0.117			0.384	
		(0.085)			(0.417)	
Psychological distress (>12)		-0.538**			2.416**	
		(0.215)			(1.123)	
Psychological distress interference:						
A little			-0.167			0.830
			(0.126)			(0.621)
Some			-0.112			0.127
			(0.158)			(0.791)
A lot			-0.542**			2.431**
			(0.224)			(1.151)
Education	-0.069	-0.069	0.120	0.287	0.289	-0.556
	(0.146)	(0.146)	(0.231)	(0.674)	(0.674)	(1.102)
Income	0.375***	0.376***	0.365***	-0.765***	-0.769***	-0.631
	(0.055)	(0.055)	(0.085)	(0.281)	(0.281)	(0.453)
Employed	0.253***	0.259***	0.408**	-0.636	-0.665	-1.275
	(0.096)	(0.096)	(0.161)	(0.481)	(0.481)	(0.827)
Married	0.457**	0.460**	0.712**	-1.030	-1.048	-2.232
	(0.191)	(0.191)	(0.293)	(0.918)	(0.919)	(1.422)
Divorced	-0.258	-0.255	-0.644*	1.473	1.458	2.872
	(0.240)	(0.240)	(0.353)	(1.167)	(1.167)	(1.758)
Birth of child	-0.040	-0.037	-0.115	0.577	0.566	1.410
	(0.118)	(0.118)	(0.192)	(0.553)	(0.553)	(0.913)
Death of a family member	0.136	0.116	-0.311	-0.817	-0.713	1.262
	(0.191)	(0.191)	(0.312)	(0.927)	(0.925)	(1.560)
Lay off	0.126	0.125	0.018	0.126	0.133	0.640
	(0.168)	(0.168)	(0.258)	(0.848)	(0.849)	(1.351)
Missed work with illness	-0.068**	-0.069**	-0.038	0.370**	0.372**	0.192
	(0.035)	(0.035)	(0.053)	(0.167)	(0.167)	(0.256)
Individual f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Time f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Within R^2	0.014	0.014	0.018	0.007	0.007	0.010
Baseline predicted probability				13.062	13.062	16.090
Observations	54860	54860	23866	54860	54860	23866

icantly increases the likelihood of individuals experiencing deficit net worth states – in Column (4), the increase is estimated to be 5% greater than the average baseline risk in the model. The increase in baseline risk is observed to be much higher (15-18%) and statistically significant for individuals with high levels of psychological distress or when psychological distress interferes a lot with their daily life and activities.[2]

Next, we undertake robustness analysis to test the stability of the above baseline findings. More particularly, we examine how robust our estimates are to selection biases related to unobservable covariates, using the approach of Oster (2019). This test enables us to quantify the stability of our estimated parameters, which inspects the selection on observables and in turn highlights the po-

tential role of omitted variable bias, under the assumption that selection on unobservables is proportionate to selection on observables. The procedure estimates the test statistic δ, which indicates the degree of omitted variable bias necessary to fully eradicate the established effects of psychological distress. δ is defined as $\frac{\beta_F}{\beta_R - \beta_F} \times \frac{R_F - R_R}{R_{Max} - R_F}$. β_F (β_R) is the coefficient on psychological distress from the model with (without) the set of control variables. R_{Max} is the R^2 from the hypothetical regression including both observed and unobserved controls. As recommended by Oster (2019), we set R_{Max} to be 1.3 times R_F, which is the R^2 from the model with the set of control variables. We use the within R^2 statistic for constructing the test, given that we want to identify how psychological distress and (deficit) net worth evolves over time for a given individual rather than focusing on differences between individuals, rendering individual fixed effects as nuisance parameters (see implementation details in Oster, 2016). The higher the δ, the less plausible it is that selection on non-observables will account for the estimated relationship.

Table 3 reports the test results, which indicate that the influence of potential omitted variables would need to be implausibly large – around 4.2 times as important as the effect of our currently

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[2] To understand the wider real effects arising from poor mental health, in supplementary analysis (available upon request) we inspect mortgage delinquencies (i.e., at least three months behind on mortgage payments) among the psychologically distressed individuals who are in deficit net worth. We find that a one standard deviation increase in psychological distress leads to a 0.19 percentage point increase in the probability of deficit net worth and mortgage delinquency. Using the estimates reported in Table 2 and the definition of conditional probabilities, we calculate that 29% of psychologically distressed individuals entering deficit net worth are falling into delinquency on mortgage payments.

Table 3

Evaluating the influence of unobservables using selection on observables The table reports results from the Oster (2019) test for the degree of omitted variable bias (δ) necessary to fully eradicate the established effects of psychological distress in the full model estimates of Table 2. δ is defined as $\frac{\beta_F}{\beta_R - \beta_F} \times \frac{R_F - R_R}{R_{Max} - R_F}$. β_F (β_R) is the coefficient on psychological distress from the full model with (without) the set of control variables (in the restricted model). Individual and time fixed effects are included in all the models. R_{Max} is set to be 1.3 times R_F, which is the R^2 from the model with the set of control variables. Within R^2s are utilized in the construction of the test. Panel A shows the results where net worth is the dependent variable, while Panel B shows the results for deficit net worth. β^* is the estimate of the key explanatory variable if unobservables were as influential as observables (i.e., $\delta = 1$). $[\beta^*, \beta_F]$ is the range of plausible coefficient values for the key explanatory variable.

Full model	Key independent variable	δ	$[\beta^*, \beta_F]$
Panel A: Net worth as dependent variable			
Model (1)	Psychological distress	4.226	[-0.110, -0.141]
Model (2)	Psychological distress (5 - 12)	2.982	[-0.078, -0.117]
	Psychological distress (>12)	4.172	[-0.414, -0.538]
Model (3)	Psychological distress interference:		
	A little	4.682	[-0.132, -0.167]
	Some	1.460	[-0.035, -0.112]
	A lot	4.319	[-0.424, -0.542]
Panel B: Deficit net worth as dependent variable			
Model (4)	Psychological distress	6.195	[0.563, 0.650]
Model (5)	Psychological distress (5 - 12)	2.679	[0.243, 0.384]
	Psychological distress (>12)	6.200	[2.066, 2.416]
Model (6)	Psychological distress interference:		
	A little	5.310	[0.679, 0.830]
	Some	0.423	[-0.175, 0.127]
	A lot	5.277	[2.026, 2.431]

included covariates in Model (1) – to change our interpretation of the effects of psychological distress on net worth. Similar conclusions can be drawn for the other models. For deficit net worth regressions, the omitted variable effects would need to be around 6.2 times the effect of the observable variables to nullify the main results. The existence of large omitted factors seems unlikely given our comprehensive set of controls and the overall persistence of individuals' net worth. To assess the potential bias in the coefficient on psychological distress, we estimate β^*, which represents the "lower bound" of the coefficient if there existed proportionate selection on unobservables that was equally important as the controls included in our model (i.e., $\delta = 1$). In Table 3, we report the set of possible ranges $[\beta^*, \beta_F]$. We find that the range indicates a narrow interval, which suggests that the estimates are robust.

In Appendix Table A2, we conduct additional Oster tests to gauge the stability of the significant psychological distress coefficients as we vary controls. We find that demographic variables (education, income and employed) are key observable covariates in the net worth models, increasing δ to around three. Including further controls sequentially in the models shows the quality of the control variables, as they add more explanatory power in terms of the within R^2s. In all the models, the coefficient on psychological distress (β_F) is relatively stable. For deficit net worth regressions, we find that marital status variables and socio-economic life events are the important observable covariates driving the explanatory power. Again, the psychological distress coefficients appear to be very stable when we include important observable controls, as diagnosed by the movements in the within R^2s. Overall, these tests attenuate concerns about influential omitted variables driving the significance of the psychological distress variables.

To further address endogeneity concerns arising from time-varying unobserved heterogeneity, in the Online Appendix Table A3 we use a Difference GMM approach that extends Equations (1) and (2) by including the first and second lags of the dependent variable as regressors (see Roodman, 2009).[3] The structure of the model ex-

ploits the dynamic relationships inherent in our explanatory variables, while the difference GMM estimation approach circumvents the introduction of bias arising from inclusion of lagged dependent variables as regressors when individual fixed effects are present in the model (Nickell, 1981; Roodman, 2009). As such, the specification enables us to account for unobserved time-varying heterogeneity by accounting for the relation between current psychological distress and past net worth effects. The estimation results further confirm the robustness of our findings.

Additionally, we conduct a series of sensitivity analyses. First, we employ alternative regression specifications by including (i) double-clustered standard errors at the respondent and time levels, recognizing error-term correlations in both dimensions, and (ii) state fixed effects and state-time fixed effects, to control for local economic conditions. The estimation results are reported in the Online Appendix Tables A4 and A5, respectively. We see that the effects of psychological distress on (deficit) net worth remain strongly significant across the various model specifications. Second, we assess the sensitivity of the results to student loan debt, as it may predict net worth dynamics, especially among younger households in the U.S., who commonly hold a large amount of student loan debt on their balance sheets. For instance, a recent survey from the Federal Reserve Board shows that the largest percentage of adults with student loan debt are under the age of 30, with student loan debt less common among older age groups (only 22% among adults aged 30 to 44 and 4% for those 45 and older) (Cilluffo, 2019). Therefore, we conduct robustness checks with subsamples of older households (age ≥ 30, age ≥ 45), whose net worth will be less sensitive to the presence of student loan debt. We also provide results excluding those with a college degree or above, who will be more likely to hold a large student debt burden. Additionally, we retrieve data on student loan amounts, which was captured by PSID only since 2011, and remove the student loan amounts from the calculation of net worth. As student loan amount is a liability, we add it back into the net worth. The regression results are reported in the Online Appendix Table A6. We find that the coefficient for psychological distress remains strongly significant across all the specifications and subsamples considered.[4]

3.2. Analysis of deficit net worth duration using survival models

We study the impact of psychological distress on the likelihood of experiencing deficit net worth over time on a hazard scale. Specifically, individuals facing psychological distress can more frequently enter deficit net worth states for prolonged periods of time, and psychological distress can additionally affect the propensity to exit from or re-enter deficit net worth. By employing survival models, we shed light on these issues empirically and answer questions such as: Do individuals who experience more psychological distress enter deficit net worth sooner and perhaps stay longer than those who experience less? Does less psychological distress make exits from deficit net worth states more likely? And if such exits occur, does psychological distress increase the chances of re-entry into deficit net worth? Understanding these dynamics is important because it provides essential guidance to the appropriate interpretation of the risks faced by psychologically distressed individuals. For instance, deficit net worth can provide a deeper explanation for important heterogeneity in time preference relating

restrictive assumptions, we allow all explanatory variables to be endogenous. In line with standard practice, the time dummies enter the estimation as exogenous regressors. The results are robust to a number of approaches, including the use of deeper lags of the dependent variables as regressors.

[4] The results also corroborate the findings from the Blinder-Oaxaca decomposition, which shows that student loan debt plays an indistinguishable role for the net worth effects studied in the paper.

[3] In our estimation strategy, we use the orthogonal deviations transformation (see Roodman, 2009). Further, we use the two-step estimator, and to make the least
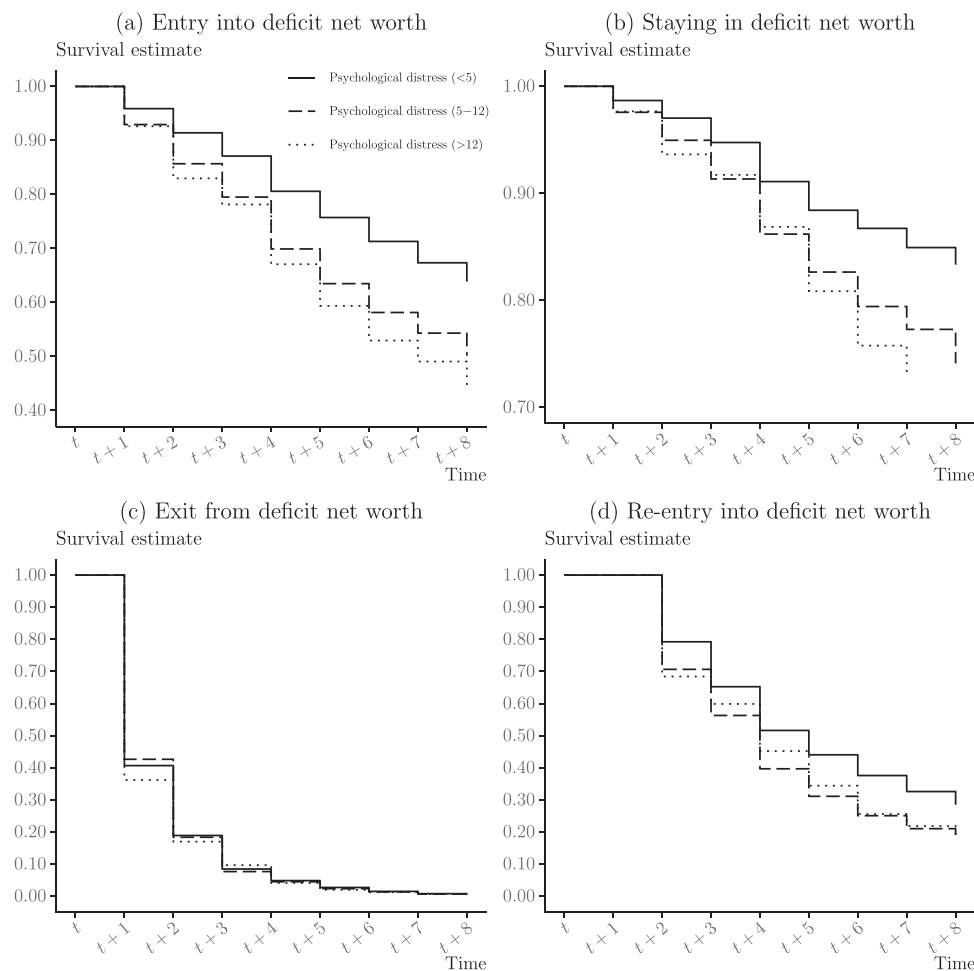
Fig. 1. Psychological distress and deficit net worth survival estimates The figure plots the length of time taken until the various deficit net worth events (entry, stay, exit and re-entry) occur. The survival estimates plotted are the probabilities that respondents who are not in deficit net worth at time t will remain so at time $t + h$ for $h = 1, \ldots, 8$. The different lines denote the survival probabilities for the subgroups of respondents at different psychological distress levels (<5, 5 - 12 and >12). Estimates are obtained via the Kaplan-Meier estimator. Time runs at a biennial frequency spanning the years 2001 - 2019.

to informal default (Athreya et al., 2019) and alter the opportunity cost of investment, with longer term implications on portfolios holdings (Davis et al., 2006; Becker and Shabani, 2010).

Survival models are particularly suited to investigating the duration dependencies of deficit net worth, as they enable the statistical modeling of how long, on average, individuals remain in positive net worth (i.e., surviving deficit) before entering states of prolonged deficit net worth. Further, these models account for right censoring, thereby efficiently making use of respondents' information even when they do not experience changes in their net worth status. For those individuals that enter deficit net worth, survival models can quantify the impact of psychological distress on their exit from deficit net worth. Additionally, for those individuals that succeed in returning to positive net worth, the effect of psychological distress on re-entry to deficit net worth can be studied.

3.2.1. Understanding the baseline hazard over time

In order to understand the dynamically evolving baseline risk of entry into, staying in, exit from and re-entry into deficit net worth, we begin our analysis by visually inspecting the non-parametric estimates of survival functions for deficit net worth, where psychological distress is evaluated when an individual is at risk of a given deficit net worth event occurring. Figure 1 visualizes the estimated survival curves, which depict the relationship between time and the likelihood of a deficit net worth event not occurring up to the

time stamp on the x-axis – in other words, the chances of "surviving" without the relevant deficit net worth event taking place. The time interval between observations is two years, given the biennial interview wave pattern of our data. Plot (a) shows the survival curves for entry into deficit net worth, Plot (b) shows those for staying in deficit net worth for at least two consecutive waves, while those in Plots (c) and (d) relate to exits from and re-entry into deficit net worth, respectively. In each plot, we plot the different categories of psychological distress (those with psychological distress scores <5, 5 - 12 and >12).

Inspecting the entry into deficit net worth survival curves in Plot (a), several observations emerge. First, individuals with psychological distress scores in the ranges of 5 - 12 and >12 exhibit significantly lower chances of remaining in positive net worth than those with low scores. Second, the distances in survival curves between the low (scoring <5) versus the moderate (5 - 12) and high (>12) psychological distress groups suggests that individuals with moderate to high psychological distress have a significantly greater risk of entering deficit net worth as time progresses. While the survival chance at $t + 8$ for the lowest psychologically distressed group is close to 70%, it falls in the range 50% – 60% for the moderate and high groups. A similar pattern is observed in (b), where we examine the survival curves of individuals staying in deficit net worth for at least 2 consecutive waves (which corresponds to at least 4 years). Comparing plots (a) and

(b), the relative positions of the moderate and high psychologically distressed groups narrow and substantial risks of staying in deficit net worth for longer periods of time remain. Overall, we conclude that once individuals suffer from psychological distress, their chances of remaining in positive net worth are consistently depressed.

Plot (c) shows the survival curve relating to exit from deficit net worth. Two characteristics of these curves stand out. First, a relatively small proportion of individuals do not exit from deficit net worth as time progresses; at $t + 2$ (after four years), approximately 80% of respondents have returned to positive net worth. Second, psychological distress does not appear to influence these exit probabilities, with the survival curves for all different levels of distress bunching together. This suggests that while the psychological distress of individuals significantly determines entry into deficits, other factors contribute to the persistence of deficit net worth we observe. Having said which, psychological distress remains a significant influencing factor for the length of time taken to re-enter deficit net worth: Plot (d) shows that the likelihood of re-entering deficit net worth increases with the degree of psychological distress. Finally, comparing the survival curves in Plot (a) with those in Plot (d) reveals an important characteristic: a downward shift in the survival curves in all instances. This indicates that once individuals experience periods of deficit net worth, their risk of facing deficits again at any point in time increases.

3.2.2. Cox Proportional Hazard Models

In order to measure the effect of psychological distress on the time it takes for the occurrence of a deficit net worth event when the individual is first at risk, we use semi-parametric Cox proportional hazard models (PHMs). These enable us to quantify the proportional impact of psychological distress on the baseline hazard without the requirement to explicitly parameterize this rate. PHMs are designed to efficiently analyze duration dependencies without restrictive distributional assumptions and thus are widely used in empirical applications (see, for example, Feng and Seasholes, 2005; Michelacci and Ruffo, 2015; Vaarmets et al., 2018). Specifically, we model the hazard rate, which measures the likelihood of the deficit net worth event taking place at time $t + 1$, given that it has not taken place until time t. We express the hazard rate, $h_{i,t+1}$, as a function of individual-specific observable characteristics:

$$h_{i,t+1} = h_{0,t+1} \exp \left(\beta PsyDistress_{i,t} + X'_{i,t}\theta \right), \tag{3}$$

for an individual i and where our coefficient of interest is β, which captures the effect of psychological distress as measured by the scores on the K6 psychological distress scale. For each deficit net worth event, we further estimate separate models for indicator variables capturing different levels of distress (<5, 5 - 12 and >12) and indicator variables capturing the degree of psychological distress interference with everyday life. In all the estimated models, the control variables (denoted $X_{i,t}$) are the time-varying demographic attributes and socio-economic life events considered in the baseline regressions, as well as additional controls for age, gender and ethnicity types. The time-variant baseline hazard is $h_{0,t+1}$, which mimics the role of time fixed effects by absorbing common cross-sectional shocks. Standard errors are clustered at the individual level.

Table 4 reports the estimation results. Panels A to C show those for the different psychological distress measures, while the columns relate to different deficit net worth events. The reported values are hazard ratios, where a value greater (less) than one indicates that an increase in the value of a variable proportionally increases (decreases) the baseline hazard for this deficit net worth event.

Column (1) reports the results for entering deficit net worth on the hazard scale. We see that the estimated hazard ratios for all the psychological distress variables are strongly significant, at the 1% level. Panel A shows that a one standard deviation increase in psychological distress is associated with an increase in the baseline hazard by 14.9%. Panel B shows that for moderate (high) psychological distress in the 5 - 12 (>12) range, the baseline hazard increases by 28.8% (54%). Panel C shows that the estimates relating to psychological distress interference imply an increase of the baseline hazard by 17.6% to 53.2%. Column (2) reveals highly similar roles of psychological distress for individuals staying in deficit net worth for at least 2 consecutive periods and with significant effects when the interference level is "a lot". In sum, as psychological distress and its interference with everyday decision-making increases, individuals face a significantly higher probability of entering deficit net worth sooner and staying longer. Interestingly, in line with the evidence provided by the survival curves, Column (3) shows that once in deficit net worth, the time taken to exit to a positive net worth state cannot be explained by psychological distress, with insignificant hazard ratios close to unity across the measures. This contrasts with the estimates of Column (4), relating to the probabilities of re-entering a state of deficit net worth. In this case, individuals experiencing psychological distress exhibit greater risks of re-entering deficit net worth states. These patterns of results indicate that psychological distress has long-term adverse effects on the net worth of individuals experiencing it.

4. Blinder-Oaxaca decomposition: Assessment of household financial accounts

In this section, we uncover the key channels driving the observed effects of psychological distress on individuals' net worth and deficit net worth. For this, we follow a Blinder-Oaxaca decomposition approach, akin to Parise and Peijnenburg (2019) and Mueller and Yannelis (2019), among others. The decomposition examines the components from households' income statements and balance sheets to shed light on the relative importance of the components for explaining the gap in net worth levels and deficit net worth probabilities, across individuals with low and high psychological distress.

The effects of psychological distress can manifest in household financial accounts in various ways. Psychological distress can impede cognitive capacities for optimal decision-making (Agarwal and Mazumder, 2013; Mani et al., 2013; Deck and Jahedi, 2015; Schilbach et al., 2016), potentially affecting depletions on the asset side of the household balance sheet. Equally, if psychological distress affects the perception of risk, reward and the time value of money, then we should observe an increase in consumption expenses. If such "retail therapy" (Dahal and Fertig, 2013) is financed through unsecured borrowing, increases in debt level should be observable. Furthermore, decreases in individual productivity should depress labor income, while costly expenditures on psychological treatments would increase medical expenses.

We obtain detailed information on households' financial accounts (i.e., items of income, expenses, assets and debts) from the PSID, which collects such information in its survey waves since 2011. We conduct the Blinder-Oaxaca decomposition for the sample period 2011 to 2019, in which we have all the relevant information. Appendix B provides the description of the various components considered. The decomposition amounts to studying the changes in (deficit) net worth resulting from the counterfactual exercise in which individuals with low psychological distress are endowed with the income, expenses, assets and debts of the highly distressed. To implement the decomposition, we first extend the fixed effects baseline regression models for net worth and deficit

Table 4

Cox proportional hazards model: hazard ratios The table reports estimates of hazard ratios from Cox proportional hazard models. Coefficient estimates higher (lower) than unity indicate increases (decreases) in the baseline hazard. The dependent variables in Columns (1)-(4) are the length of time taken until occurrence of the various deficit net worth events (entry, stay, exit and re-entry). Panel A shows the results where the explanatory variable is the psychological distress score; Panel B those for psychological distress indicator variables capturing the levels <5, 5 - 12 or >12; and Panel C those for the psychological distress interference measures. Controls include demographic attributes and socio-economic life events. Standard errors are included in parentheses and clustered at the respondent level. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

	Deficit net worth event			
	Entry (1)	Stay (2)	Exit (3)	Reentry (4)
Panel A: Psychological distress				
Psychological distress	1.149***	1.126***	0.987	1.061***
	(0.017)	(0.031)	(0.011)	(0.022)
Observations	48920	40844	7959	10309
Panel B: Psychological distress levels				
Psychological distress (5 - 12)	1.288***	1.272***	1.003	1.197***
	(0.049)	(0.087)	(0.027)	(0.061)
Psychological distress (>12)	1.540***	1.449***	0.933	1.218**
	(0.114)	(0.204)	(0.048)	(0.120)
Observations	48920	40844	7959	10309
Panel C: Psychological distress interference				
Psychological distress interference:				
A little	1.176***	1.048	0.949	1.195**
	(0.060)	(0.099)	(0.036)	(0.084)
Some	1.214***	1.186	0.967	1.115
	(0.077)	(0.135)	(0.042)	(0.100)
A lot	1.532***	1.364**	0.936	1.353***
	(0.115)	(0.196)	(0.051)	(0.138)
Observations	22181	18304	4696	5651
In all panels:				
Demographic attributes	Yes	Yes	Yes	Yes
Socio-economic life events	Yes	Yes	Yes	Yes

net worth introduced in Section 3.1 and separate observations into high or low psychological distress groups based on whether scores are above 12 or below 5 on the K6 psychological distress scale, respectively. We then collect the components of income, expenses, assets and debt in the vector $Components_{i,t}$ for each individual i at time t. The components are added as explanatory variables to the regression models for net worth and deficit net worth. We conduct separate regressions for (i) income and expenses, (ii) assets and debts and (iii) all components jointly. For a given vector of components, the following regressions are estimated:

$$NetWorth_{i,t+1} = \alpha_i + \zeta_{t+1} + Components'_{i,t+1}\gamma \\ + \mathbb{1}(PsyDistress_{i,t} > 12)\beta + X'_{i,t}\theta + \varepsilon_{i,t+1}, \\ \forall i \in \{i \mid PsyDistress_{i,t} < 5 \text{ or } PsyDistress_{i,t} > 12\} \quad (4)$$

$$DeficitNetWorth_{i,t+1} = \alpha_i + \zeta_{t+1} + Components'_{i,t+1}\gamma \\ + \mathbb{1}(PsyDistress_{i,t} > 12)\beta + X'_{i,t}\theta + \varepsilon_{i,t+1}, \\ \forall i \in \{i \mid PsyDistress_{i,t} < 5 \text{ or } PsyDistress_{i,t} > 12\} \quad (5)$$

where the indicator function ($\mathbb{1}$) creates a dummy variable taking the value of one for respondents with high psychological distress (scores >12), and zero for those with low psychological distress (scores <5).[5] In line with our baseline models, we include individual (α_i) and time (ζ_{t+1}) fixed effects, as well as the set of control variables capturing demographic attributes including education, employment status, marital status, and socio-economic life events. For brevity, we report the estimated coefficients for the var-

ious components from the regressions in Table A7 in the Online Appendix.

Next, we proceed to calculate the magnitude of the gaps in net worth and deficit net worth probabilities explained by the Blinder-Oaxaca decomposition, by generating the fitted values for the lower and higher psychological distress groups from Equations (4) and (5), respectively. These results are reported in Panel A of Table 5. We find that the high and low psychological distress groups hold respective mean net worth levels of 6.137 and 8.310, implying a gap in net worth levels of - 2.173. Analogously, the gap in the probability of being in deficit net worth between the high and low psychologically distressed groups amounts to 9.191 percentage points. This indicates that high distressed individuals are around 1.7 (22.165/12.975) times more likely to experience deficits than their counterparts with low distress levels.

While we observe significant differences in net worth and deficit net worth for high and low psychological distress groups, ultimately, we are interested in understanding what drives these differences. For this, we assign the components of financial accounts of the high group to those of the low group and examine the resulting impact on the fitted net worth levels and fitted deficit net worth probabilities. This counterfactual exercise reveals how much of the gap between the high and low groups is explained by the various components. More formally, for the case of net worth as the outcome variable, the contribution of component k can be expressed as

$$\widehat{\Delta NetWorth}_{k,t+1} = (\overline{Components^H_{k,t+1}} - \overline{Components^L_{k,t+1}})\hat{\gamma}_k, \quad (6)$$

equating to the corresponding difference in mean endowment levels across the high (H) and low (L) psychological distress groups multiplied by the estimated coefficient for the component. The specification for deficit net worth as the outcome variable follows analogously to the above. For interpretation of the contributions as percentages of the gap, each component's contribution estimated from Equation (6) is divided by the difference in the fitted values

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[5] By including the indicator for high psychological distress, we explicitly allow for direct effects from high psychological distress to be modeled. However, robustness tests reveal that removing the high psychological distress indicator from the specification does not produce any meaningful differences in the decomposition estimates (results available upon request).

Table 5

Blinder-Oaxaca decomposition The table reports the Blinder-Oaxaca decomposition results. Panel A shows the fitted net worth levels and deficit net worth probabilities for the high and low psychological distress groups from Equations (4) and (5), respectively. Panel B shows the decomposition results for various components (income and expenses, assets and debts and all components jointly). Columns (1)-(6) show the estimates where net worth is the dependent variable, while Columns (7)-(12) show those for deficit net worth. For each decomposition, the first column (Contr.) shows the component contribution to the gap in net worth or deficit net worth between the high and low psychological distress groups, and the second column (%) shows how much of the gap is explained. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

Panel A: Differences in fitted (deficit) net worth by psychological distress groups

	Net worth (1)	Deficit net worth (2)
High psychological distress	6.137	22.165
Low psychological distress	8.310	12.975
Difference	-2.173	9.191

Panel B: Blinder-Oaxaca decomposition

	Net worth						Deficit net worth					
	Income and expenses		Assets and debts		All		Income and expenses		Assets and debts		All	
	Contr. (1)	% (2)	Contr. (3)	% (4)	Contr. (5)	% (6)	Contr. (7)	% (8)	Contr. (9)	% (10)	Contr. (11)	% (12)
Income contribution:	-0.565***	26.0			-0.408***	18.8	1.217***	13.2			0.854**	9.3
Labor income	-0.517***	23.8			-0.384***	17.7	1.100***	12.0			0.805**	8.8
Asset income	-0.031***	1.4			-0.013	0.6	0.069***	0.8			0.019	0.2
Business income	-0.017***	0.8			-0.011**	0.5	0.048**	0.5			0.030	0.3
Expenses contribution:	-0.371***	17.1			-0.238***	11.0	1.077***	11.7			0.678**	7.4
Housing expense	-0.016	0.8			-0.012	0.6	-0.021	-0.2			-0.026	-0.3
Mortgage expense	-0.123***	5.7			-0.024	1.1	0.211	2.3			-0.103	-1.1
Health expense	-0.032*	1.5			-0.050***	2.3	0.087	0.9			0.223***	2.4
Recreation expense	-0.045***	2.1			-0.035***	1.6	0.154***	1.7			0.114*	1.2
Food expense	-0.133***	6.1			-0.100***	4.6	0.513***	5.6			0.365**	4.0
Childcare expense	-0.021	1.0			-0.016	0.7	0.133**	1.4			0.104*	1.1
Financial assets contribution:			-1.009***	46.42	-0.960***	44.18			2.748***	29.90	2.620***	28.51
Checking/savings			-0.843***	38.8	-0.799***	36.8			2.384***	25.9	2.272***	24.7
Stocks			-0.092***	4.2	-0.089***	4.1			0.147***	1.6	0.137***	1.5
Other financial assets			-0.074***	3.4	-0.072***	3.3			0.217***	2.4	0.212***	2.3
Debts contribution:			-0.550***	25.3	-0.497***	22.9			2.135***	23.2	2.119***	23.1
Credit card debt			0.191***	-8.8	0.193***	-8.9			-1.056***	-11.5	-1.060***	-11.5
Family loan			-0.018*	0.9	-0.018*	0.8			0.136***	1.5	0.133***	1.5
Legal bills			-0.024	1.1	-0.024	1.1			0.103	1.1	0.103	1.1
Medical debt			-0.456***	21.0	-0.457***	21.0			2.569***	28.0	2.577***	28.0
Student loan			0.148***	-6.8	0.148***	-6.8			-0.770***	-8.4	-0.770***	-8.4
Vehicle loan			-0.065***	3.0	-0.059***	2.7			0.206***	2.3	0.191**	2.1
Home mortgage loan			-0.325***	15.0	-0.280***	12.9			0.946***	10.3	0.945***	10.3
Total explained		43.1		71.7		96.8		25.0		53.1		68.2

between the high and low psychological distress groups reported in Panel A. Panel B of Table 5 reports the estimates. The contributions from the income statement and balance sheet components are decomposed separately and are also jointly decomposed.[6] We find that running separate decompositions for income statement and balance sheet components can lead to more component variables being significant due to the double-entry treatments in financial statements, although the total contributions remain similar in magnitude. Therefore, we rely on the joint decomposition results for our interpretation of the economic importance of the components.

We find that the differences in net worth between the low and high psychological distress groups is explained by significant differences in (i) financial assets, particularly checking/savings accounts (36.8%); (ii) debt components, particularly medical debt (21%) and home mortgage loans (12.9%); (iii) income components, particularly labor income (17.7%); and to a lesser extent by (iv) expense components, particularly food expenses (4.6%). We see that individuals with high psychological distress have lower credit card debt and therefore it negatively contributes to explaining the net worth gap between the high versus low psychological distress groups. For the decomposition of the probability of deficit net

worth, we obtain similar patterns in terms of the channels driving the differences between the low and high psychological distress groups – in order of the contribution levels, the largest differences are explained by medical debt (28%), checking/savings accounts (24.7%) and labor income (8.8%).

In summary, by assessing the various income statement and balance sheet components, we find that depleted levels of savings, higher amounts of medical loans and lower labor income predominantly explain the lower net worth and deficit net worth effects of individuals with high psychological distress, in comparison to those with low psychological distress. Our findings indicate that psychological distress imposes significant stresses to household finances, across the channels of financial assets, debts and income.

5. Additional Analysis

5.1. The role of socio-economic status

In this section, we explore whether the effects of psychological distress on individuals' net worth differ according to their socio-economic status (SES). For instance, lower SES groups may experience greater impact from psychological distress, driven by poverty-related factors such as stress, negative affective states, high cognitive load, low financial literacy and pessimism bias (Mani et al., 2013; Haushofer and Fehr, 2014; Kuhnen and Miu, 2017). However,

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[6] Results obtained from individually decomposing the income, expenses, assets and debts are reported in the Online Appendix Table A8.

Table 6

The role of socio-economic status (SES) The table reports estimates from linear fixed effects regressions in which the dependent variable in Columns (1)-(3) is net worth (IHS transformed), and in Columns (4)-(6) it takes the value 100 if respondents are in deficit net worth, and zero otherwise. SES is the distance of individuals' family income from their estimated income poverty level and is IHS transformed. Lower (higher) values of SES indicate those that are more income-poor (non-income-poor). Controls include the demographic attributes education, employment status and marital status, as well as the socio-economic life events. Exact definitions of the variables are provided in Appendix A. Individual and time fixed effects are included. Time runs at a biennial frequency spanning the years 2001 - 2019. Standard errors are included in parentheses and clustered at the respondent level. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

	Net worth			Deficit net worth		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Psychological distress						
SES	0.055***	0.055***	0.055***	-0.146***	-0.144***	-0.140***
	(0.006)	(0.006)	(0.006)	(0.028)	(0.028)	(0.028)
Psychological distress		-0.139***	-0.147***		0.639***	0.711***
		(0.043)	(0.044)		(0.216)	(0.222)
Psychological distress × SES			0.005			-0.041**
			(0.004)			(0.019)
Observations	54831	54831	54831	54831	54831	54831
Panel B: Psychological distress levels						
SES		0.055***	0.053***		-0.145***	-0.125***
		(0.006)	(0.006)		(0.028)	(0.029)
Psychological distress (5 - 12)		-0.112	-0.138		0.370	0.542
		(0.085)	(0.092)		(0.417)	(0.468)
Psychological distress (>12)		-0.545**	-0.550**		2.395**	2.390**
		(0.215)	(0.218)		(1.124)	(1.127)
Psychological distress (5 - 12) × SES			0.006			-0.039
			(0.008)			(0.041)
Psychological distress (>12) × SES			0.020			-0.177*
			(0.020)			(0.101)
Observations		54831	54831		54831	54831
Panel C: Psychological distress interference						
SES		0.063***	0.061***		-0.194***	-0.187***
		(0.009)	(0.011)		(0.045)	(0.053)
Psychological distress interference:						
A little		-0.155	-0.166		0.791	0.836
		(0.126)	(0.136)		(0.622)	(0.701)
Some		-0.095	-0.099		0.112	0.019
		(0.159)	(0.166)		(0.793)	(0.856)
A lot		-0.536**	-0.529**		2.445**	2.342**
		(0.225)	(0.228)		(1.156)	(1.170)
A little × SES			0.003			-0.012
			(0.012)			(0.062)
Some × SES			-0.000			0.050
			(0.015)			(0.077)
A lot × SES			0.023			-0.142
			(0.020)			(0.107)
Observations		23781	23781		23781	23781
In all panels:						
Individual f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Time f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Demographic attributes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic life events	Yes	Yes	Yes	Yes	Yes	Yes

the absence of heterogeneous effects based on SES would provide strong support for the widespread effects observed from psychological distress on household balance sheets.

We derive households' socio-economic status from their federal poverty thresholds estimated by the US Census, which utilizes family size, age of the householder and the number of children under the age 18 for its computation. Households with family income levels below 185 percent of the federal poverty thresholds are considered to be in income poverty. As such, SES is the distance of individuals' family income from their estimated income poverty level, with lower (higher) values determining those that are more income-poor (non-income-poor). The threshold value of 185 percent is a widely used cut-off level by the federal government to identify households in the low income bracket and those eligible for various school lunch, home energy, and health insurance assistance programs.

Table 6 compares the effects of SES and psychological distress for the net worth and deficit net worth regressions. We find that,

as expected, individuals with a higher socio-economic status have a higher net worth and lower deficit net worth probabilities. The direct effect from psychological distress remains significant in all the regression specifications where we include both SES and psychological distress. In fact, its influence on (deficit) net worth is not diminished when we account for SES. Interestingly, interacting SES with psychological distress reveals that the effect of psychological distress on net worth levels is not related to the SES of individuals. However, we see that SES plays a significant role in moderating the effect of psychological distress on deficit net worth probabilities. That is, individuals with a lower SES have significantly higher probabilities of facing deficit net worth stemming from their psychological distress. Overall, the results indicate that the detrimental effect of psychological distress is responsive to the SES of individuals when it comes to the probability of facing deficit net worth. However, the effect of psychological distress on net worth levels is homogeneous across individuals no matter the strata of

Table 7

Effects from the exogenous shock of the Global Financial Crisis The table reports estimates from linear fixed effects regressions in which the dependent variable in Columns (1)-(3) is net worth (IHS transformed), and in Columns (4)-(6) it takes the value 100 if respondents are in deficit net worth, and zero otherwise. The sample period spans the years 2005-2011 with biennial frequency. Financial crisis is an indicator variable for the crisis years 2009 and 2011, and takes the value zero otherwise. Psychological distress variables entering the interaction are fixed at their value in the year 2005. Controls include demographic attributes and socio-economic life events, as well as their interactions with the crisis indicator. Exact definitions of the variables are provided in Appendix A. Individual and time fixed effects are included. Standard errors are included in parentheses and clustered at the respondent level. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

	Net worth			Deficit net worth		
	(1)	(2)	(3)	(4)	(5)	(6)
Financial crisis x Psychological distress in 2005	-0.179*			1.221**		
	(0.099)			(0.500)		
Financial crisis ×						
Psychological distress in 2005 (5 - 12)		-0.368			2.469**	
		(0.231)			(1.125)	
Psychological distress in 2005 (>12)		-1.368***			7.083***	
		(0.513)			(2.696)	
Financial crisis ×						
Psychological distress interference in 2005:						
A little			-0.466			1.013
			(0.332)			(1.599)
Some			-0.500			1.273
			(0.421)			(2.130)
A lot			-1.941***			8.152***
			(0.597)			(3.151)
Individual f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Time f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Demographic attributes	Yes	Yes	Yes	Yes	Yes	Yes
Interacted with Financial crisis	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic life events	Yes	Yes	Yes	Yes	Yes	Yes
Interacted with Financial crisis	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20133	20133	8409	20133	20133	8409

socio-economic status. Our results speak of the generalized effect of psychological distress on the net worth of individuals.

5.2. Psychological distress and the Global Financial Crisis

Are psychologically distressed individuals more vulnerable to the adverse effects from economy-wide shocks? We explore this question by considering the exogenous financial shock of the Global Financial Crisis (GFC). The GFC exposed household balance sheets to significant stresses as households' debt-to-asset ratios increased sharply, contributed by declines in stock market and house prices (Gertler and Gilchrist, 2018). These adverse conditions deteriorated the household balance sheets and induced a negative effect on net worth. If psychological distress indeed imposes cognitive constraints with consequences for net worth, we expect the importance of these constraints to be exacerbated during the GFC. One of the identification challenges in this setting is that psychological distress can be confounded by changes in the expectation of future net worth as the GFC unfolds. We overcome this challenge by using individuals' psychological distress measured before the onset of the GFC, specifically by employing the psychological distress information from 2005. Hence, our regression models for net worth and deficit net worth take the forms:

$$NetWorth_{i,t+1} = \alpha_i + \zeta_{t+1} + \gamma \left(Crisis_{t+1} \times PsyDistress_{i,2005}\right)$$
$$+ X'_{i,t}\Theta + \left(Crisis_{t+1} \times X_{i,t}\right)'\Phi + \varepsilon_{i,t+1}, \quad (7)$$

$$DeficitNetWorth_{i,t+1} = \alpha_i + \zeta_{t+1} + \gamma \left(Crisis_{t+1} \times PsyDistress_{i,2005}\right)$$
$$+ X'_{i,t}\Theta + \left(Crisis_{t+1} \times X_{i,t}\right)'\Phi + \varepsilon_{i,t+1}, \quad (8)$$

where $Crisis_{t+1}$ is an indicator variable for the years 2009 and 2011, and $PsyDistress_{i,2005}$ is psychological distress captured as of 2005,

before the crisis period.[7] The estimation period spans the years 2005-2011. We include the vector of control variables $X_{i,t}$ as in the baseline specifications (Equations (1) and (2)) and add additional interaction terms between $Crisis_{t+1}$ and the controls to account for the possibility that the crisis effects can vary across observable characteristics. We also consider alternative definitions for psychological distress in different regressions. Our identification model is similar to an instrumental variable approach, where the identifying assumption is that psychological distress a few years before the crisis is uncorrelated with the unobserved within-individual changes in net worth following the onset of the crisis. The coefficient γ captures the effects of psychological distress in worsening the impact of the exogenous financial crisis on individuals' deficit net worth.

Table 7 reports the regression results. We find that individuals with psychological distress before the onset of the crisis have a greater drop in net worth and experience a significantly higher probability of facing deficit net worth states during the GFC. The estimated effects of psychological distress interacted with the financial crisis period are significant and larger in magnitude for individuals entering the financial crisis period with a higher level of psychological distress (those with scores >12 and those experiencing a lot of interference). For further illustration, Figure 2 shows the dynamic effects for psychological distress by aggregating the predicted net worth and probabilities of deficit net worth over the time dimension. These are derived from the estimated coefficients underlying the regression model in Column (5) of Table 7. The figure shows that individuals in psychological distress experience a sharp and significant increase in the likelihood of entering deficit net worth in the year of the crisis (2009). The differences remain
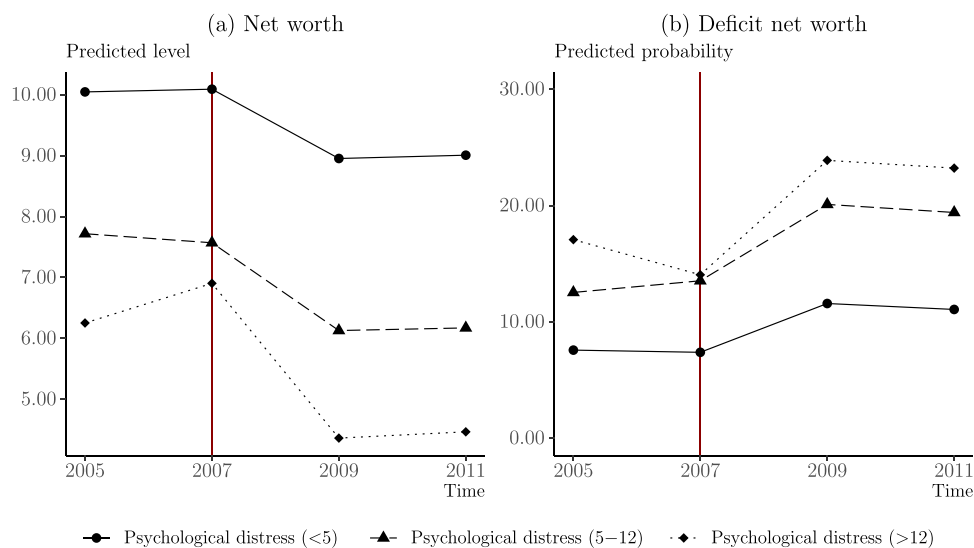
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[7] Our empirical strategy is similar to that of Duchin et al. (2010), who use a comparable specification to identify the impact of the financial crisis on investments in a corporate finance application.

Table 8

Heterogeneous effects from the Global Financial Crisis: house prices and employment The table reports estimates from linear fixed effects regressions separately for households residing in the high and low crisis-affected states. Above-(below-)median average house price declines and above-(below-)median average employment declines over the crisis period – Q3 2007 to Q4 2011 – are denoted High (Low) crisis-affected states. The dependent variable in Columns (1), (2), (5) and (6) is net worth (IHS transformed), and in Columns (3), (4), (7) and (8) it takes the value 100 if respondents are in deficit net worth, and zero otherwise. The sample period spans the years 2005-2011 with biennial frequency. Financial crisis is an indicator variable for the crisis years 2009 and 2011, and zero otherwise. Psychological distress variables entering the interaction is fixed at its value in year 2005. Controls include demographic attributes and socio-economic life events, as well as their interactions with the crisis indicator. Exact definitions of the variables are provided in Appendix A. Individual and time fixed effects are included. Standard errors are included in parentheses and clustered at the respondent level. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

	Net worth		Deficit net worth		Net worth		Deficit net worth	
	Declines in house prices				Declines in employment			
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
Panel A: Psychological distress								
Financial crisis × Psychological distress in 2005	-0.108	-0.283**	0.764	1.606**	0.005	-0.288**	0.139	1.714***
	(0.133)	(0.142)	(0.659)	(0.723)	(0.140)	(0.130)	(0.716)	(0.655)
Observations	8214	11684	8214	11684	7498	12409	7498	12409
Panel B: Psychological distress levels								
Financial crisis ×								
Psychological distress in 2005 (5 - 12)	-0.331	-0.473	2.083	2.802*	-0.318	-0.416	2.009	2.576*
	(0.328)	(0.317)	(1.638)	(1.534)	(0.373)	(0.293)	(1.875)	(1.413)
Psychological distress in 2005 (>12)	-0.940	-2.003***	5.654*	9.169**	-0.679	-1.779***	3.449	9.024**
	(0.663)	(0.754)	(3.240)	(4.190)	(0.582)	(0.683)	(3.312)	(3.578)
Observations	8214	11684	8214	11684	7498	12409	7498	12409
Panel C: Psychological distress interference								
Financial crisis ×								
Psychological distress interference in 2005:								
A little	0.115	-0.910**	-1.633	3.359	-0.001	-0.773*	-1.656	3.163
	(0.503)	(0.440)	(2.552)	(2.078)	(0.581)	(0.404)	(2.814)	(1.946)
Some	0.110	-1.097*	0.190	2.908	-0.101	-0.772	-0.736	2.837
	(0.582)	(0.581)	(3.011)	(2.926)	(0.698)	(0.523)	(3.645)	(2.588)
A lot	-1.250	-2.456***	6.274	9.977**	-0.765	-2.529***	2.092	11.391***
	(0.872)	(0.800)	(4.365)	(4.405)	(0.826)	(0.762)	(4.520)	(4.064)
Observations	3465	4837	3465	4837	2962	5342	2962	5342
In all panels:								
Individual f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic attributes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interacted with Financial crisis	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-economic life events	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interacted with Financial crisis	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Fig. 2. Psychological distress and (deficit) net worth in the Global Financial Crisis The figure plots the predicted net worth levels (Panel (a)) and deficit net worth probabilities (Panel (b)) estimated in Table 7 according to different psychological distress levels (<5, 5 - 12 and >12) measured in the year 2005 prior to the onset of the crisis period.

significant in 2011 for the groups facing high versus low psychological distress.

Further, to examine heterogeneity in the effects of the GFC, we relax the assumption that all U.S. households during the crisis years were exposed to the same level of shock and re-run Equations (1) and (2) separately for households residing in high versus low crisis-affected states. We expect psychological distress to be a significant cognitive stressor for those individuals affected by the crisis. We utilize two spatial state-level proxies for identifying high versus low severity during the crisis. The first is quarterly house price changes at the state-level over the crisis period (Q3 2007 to Q4 2011), estimated from the purchase-only seasonally adjusted national house price indices retrieved from the Federal Housing Finance Agency. The second is the annual employment declines over the crisis period (2007-2011) from the Bureau of Labor Statistics. We classify U.S. states with above-(below-)median average house price drops and above-(below-)median average employment declines as high (low) crisis-affected states.

Table 8 reports the results. Columns (1)-(4) present the results based on house price declines, while Columns (5)-(8) display the results based on declines in employment. In both cases, we find consistent results, whereby individuals with higher levels of psychological distress living in high crisis-affected states have experienced significant depletions in net worth and significant increases in deficit net worth probabilities. These state-level crisis heterogeneity results lend credence to the effects of psychological distress on net worth.

Overall, the findings in this section highlight the inequalities in economic outcomes arising due to the Global Financial Crisis for individuals with psychological distress and provide strong evidence for concomitant increases in household financial fragility in the face of economy-wide financial shocks.

6. Conclusion

This paper provides novel evidence that poor mental health affects individuals' net worth. We find that psychological distress has a substantially negative impact on individuals' net worth and makes individuals significantly more likely to be in deficit net worth. The estimated economic magnitude of the effects indicates that individuals with psychological distress are subject to a drop in net worth of around 13.2 percentage points. In terms of probability of being in deficit net worth, we find that the effects translate to an additional 5% increase relative to the estimated average baseline risk from the model. We show that psychological distress is not only more likely to bring on deficit net worth, but that it also brings it on sooner. Also, individuals who exit deficit net worth are significantly more likely to experience re-entries when they are under psychological distress. These findings highlight the long-term implications of psychological distress, because being in deficit net worth substantially hampers wealth accumulation, due to negative effects such as decreased future financing opportunities and increased cost of credit.

Using detailed financial accounts information from income statements and balance sheets, we find that the gap in (deficit) net worth for individuals with high versus low psychological distress is explained by the differing levels of savings, medical debt and labor income. This indicates that psychological distress imposes significant stresses to household finances.

We draw important policy implications from our findings for the comprehensive costs of poor mental health (OECD, 2014) and the growing, observed inequalities in household wealth (OECD, 2018). As mental health issues have become more prevalent, policy makers and financial regulators should be aware of the significant costs individuals with high psychological distress encounter, with long-term consequences for their net wealth. The importance of mental wellbeing training must be recognized, along with financial education, due to the significant link established between finance and mental health in recent years. The study adds to this evidence base to inform intervention programs.

CRediT authorship contribution statement

Adnan Balloch: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Christian Engels:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Dennis Philip:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Appendix A. Definitions of variables

Variable	Definition
Panel A: Net worth and psychological distress	
Net worth	Captures the values of assets (net of any debts) minus other debts. The components include (i) stocks in publicly held corporations, mutual funds, or investment trusts, not including stocks in employer-based pensions or Individual Retirement Accounts (IRAs); (ii) money in checking or savings accounts, money market funds, certificates of deposit, government savings bonds, or Treasury bills (not including assets held in employer-based pensions or IRAs); (iii) real estate, including main home, second home, land, rental real estate, or money to be received from a land contract; (iv) part or all of a farm or business; (v) money in private annuities or IRAs; (vi) vehicles such as cars, trucks, motor home, trailer, or boat; (vii) any other savings or assets, such as bond funds, rights in a trust or estate, cash value in a life insurance policy, or a valuable collection for investment purposes; (viii) remaining principal on mortgage(s); and (xi) other debts such as credit card charges, student loans, medical bills, legal bills, or loans from relatives. The variable is normalized by applying the inverse hyperbolic sine (IHS) transformation.
Deficit net worth	Indicator variable for net worth less than zero and then scaled by 100 for interpretation as percentages.
Psychological distress	Captures the K6 psychological distress score, which is derived from the following six questions: In the past thirty days, how often did you feel... 1. nervous? 2. hopeless? 3. worthless? 4. restless or fidgety? 5. so sad nothing could cheer you up? 6. that everything was an effort? The possible responses are "all the time", "most of the time", "some of the time", "a little of the time", or "none of the time." The given responses for each respondent are mapped to the integers 0 to 4 in ascending order of symptom frequency, summed and then transformed to z-scores.
Psychological distress (<5)	Equal to one for psychological distress scores less than 5, and zero otherwise.
Psychological distress (5 - 12)	Equal to one for psychological distress scores between 5 and 12 inclusive, and zero otherwise.
Psychological distress (>12)	Equal to one for psychological distress scores greater than 12, and zero otherwise.

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Variable	Definition
Psychological distress interference	Captures the extent to which the respondent's psychological distress interferes with their decision-making ability. Respondents choosing the options "some of the time", "most of the time" or "all of the time" for one or more questions on the K6 scale are asked the following question, "How much do these feelings usually interfere with your life or activities?" The response choices "not at all", "a little", "some", or "a lot" are mapped onto different indicator variables, one for each of the response choices.
Panel B: Demographic attributes and socio-economic life events	
Education	Captures the respondent's years of schooling and is transformed to z-scores.
Income	Captures the combined labor income of all household members (in logs).
Employed	Equal to one if the respondent is employed, and zero otherwise.
Marital status:	
Single	Equal to one if the respondent's marital status is single (i.e., never married and other single), and zero otherwise. This is taken as the base category.
Married	Equal to one if the respondent's marital status is married, and zero otherwise.
Divorced	Equal to one if the respondent's marital status is divorced, and zero otherwise.
Birth of child	Equal to one if a household member recently gave birth, and zero otherwise.
Death of family member	Equal to one if a household member recently died, and zero otherwise.
Lay off	Equal to one if the respondent was recently laid off from work, and zero otherwise.
Missed work with illness	Captures the total number of weeks of work missed due to illness, and is transformed to z-scores.

Appendix B. Description of the components in household financial accounts

Component	Description
Panel A: Income	
Labor income	Equal to the sum of labor income from full-time and part-time work, self-employment and businesses, including bonuses, overtime, tips or commissions. Transformed to logs.
Asset income	Equal to the sum of dividend, interest and rental income. Transformed to logs.
Business income	Equal to the sum of the income from businesses and farms. Transformed to logs.
Panel B: Expenses	
Housing expense	Equal to the sum of rent, property tax, insurance, loan payments, utilities, cable TV, telephone, internet charges, home repairs and home furnishings, scaled by total income and expressed as percentages.
Mortgage expenses	Equal to monthly mortgage expenses, scaled by total income and expressed as percentages.
Health expense	Equal to the sum of expenses on hospitals and nursing homes, doctors, prescriptions, in-home medical care and special facilities, scaled by total income and expressed as percentages.

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Variable	Definition
Recreation expense	Equal to the sum of expenses on (i) recreation and entertainment (including tickets to movies, sporting events) and (ii) performing arts and hobbies (including exercise, bicycles, trailers, camping, photography and reading materials), scaled by total income and expressed as percentages.
Food expense	Equal to the sum of expenses on food at home, delivered and eaten away from home, scaled by total income and expressed as percentages.
Childcare expense	Equal to the expenses on childcare, scaled by total income and expressed as percentages.
Panel C: Financial assets	
Checking/savings	Equal to funds held in checking or savings accounts, money market funds, certificates of deposit, government savings bonds, or Treasury bills (not including assets held in employer-based pensions or IRAs). Transformed to logs.
Stocks	Equal to the sum of funds in stocks in publicly-held corporations, mutual funds, or investment trusts, excluding employer-based pensions or IRAs. Transformed to logs.
Other financial assets	Equal to the sum of other savings or assets such as bond funds, rights in a trust or estate, cash value in a life insurance policy, or a valuable collection for investment purposes. Transformed to logs.
Panel D: Debts	
Credit card debt	Equal to value of total credit card/store card debt (in logs).
Family loan	Equal to value of all loans from relatives (in logs).
Legal bills	Equal to value of all legal bills (in logs).
Medical debt	Equal to value of all medical loans (in logs).
Student loan	Equal to value of all student loan debt (in logs).
Vehicle loan	Equal to value of all vehicle loans (in logs).
Home mortgage loan	Equal to value of all home mortgage loans (in logs).

Supplementary material (Online appendix)

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jbankfin.2022.106620.

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