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Financial Fragility among Middle-Income Households: Evidence Beyond Asset Building

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Abstract:

Several years after the financial crisis, financial fragility is not only pervasive in the U.S economy but also prevalent among middle-income households. This highlights the need to consider more than asset levels in order to understand household financial resilience. In this paper, we explore the determinants of financial fragility for American households in the middle-income bracket (earning $50–$75K annually) using data from the 2015 National Financial Capability Study. We analyze the socioeconomic characteristics and balance sheets of these households with focus on their debt management and expenses. According to our empirical analysis, three main factors impact financial fragility of middle-income households: family size, debt burden, and financial literacy. First, because a portion of household financial resources are committed to children, family size plays an important role in financial fragility. Second, middle-income households have a lot of debt, and the data shows that debt increases with income. While middle-income households do own assets, they are highly leveraged. In addition, they are using high-cost borrowing methods to cope with emergency expenses. Third, financial literacy is very low among financially fragile middle-income households, which is potentially problematic when there are assets and debt to manage. Moreover, we find that financial fragility has long-term consequences, as financially fragile households are much less likely to plan for retirement.

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The Financial Crisis of 2007–09 highlighted the severe economic impact of a lack of financial resilience among U.S. households. In the aftermath of the crisis, as the economy recovers, one could expect to see higher levels of precautionary savings and knowledge of financial concepts in the economy. However, more than one-third of Americans surveyed in the 2015 National Financial Capability Study (NFCS) reported that they could certainly not or probably not come up with $2,000 in a month if the need arose. Overall, the ability to cope with emergency expenses—what we define as financial fragility—remains low for households in the U.S., with adverse implications for the individual, the household, and the overall economy.

The percentage of the U.S. population classified as financially fragile decreased in the aftermath of the 2007–09 Financial Crisis. Yet, it remains at a concerningly high level when we consider that the crisis occurred ten years ago and that the economy has been recovering steadily. In 2009 nearly 50% of Americans of working age were considered financially fragile; this fraction decreased to 40% in 2012 and to 36% in 2015. Financial fragility still affects more than one-third of the population, meaning that these households are unable to readily cope with emergency expenses such as a car or home repair, a medical bill, or a small legal expense. This tells us that a substantial component of financial fragility is of structural nature and not just a result of the recession.

Household financial fragility is often attributed to low income or too few assets. However, we find that having more assets does not translate fully into greater financial resilience. Data from the 2015 NFCS show that while financial fragility is highest for low-income households, those in the middle-income ($50–$75K annually) and high-income (greater than $75K annually) ranges are also substantially financially fragile. Specifically 30% of middle-income and 20% of high-income

households could be classified as financially fragile as of 2015. This is notable, especially when comparing the relative magnitude of the emergency expense ($2,000) to a household's income level. Despite higher income, the inability to cope with financial emergencies could be caused by a myriad of factors, such as having too many expenses, complex family structures and caregiving responsibilities, or suboptimal investments. These findings highlight the need to consider more than just the level of a household's assets when exploring financial fragility.

In this paper, we analyze the determinants of financial fragility for American households in the middle-income bracket. We analyze the roots of financial fragility, examining the extent to which it is determined by high levels of indebtedness and other factors that offset high asset levels. Thus, for a comprehensive understanding of financial fragility, we analyze not only households' assets but also their debt and payment obligations, financial literacy, and demographic characteristics. Understanding the factors underlying higher financial fragility is important not only to address the short-term effect of failing to cope with an emergency but also to shed light on the implications of financial fragility for long-term financial security.

For the empirical analysis, we use data from the 2015 NFCS to analyze the socioeconomic characteristics of financially fragile middle-income households, consisting of demographic features such as education, ethnicity, age, and family structure and non-demographic characteristics like debt levels and debt management, overall financial behavior, expenses, asset ownership, and financial literacy. The NFCS is a nationally representative survey of approximately 27,000 adults. Since 2012, it has included our measure of financial fragility, determined by responses to the question "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" This comprehensive measure allows respondents to evaluate their own capacity to cope with financial emergencies in any way that suits their personal financial situation. This understanding of financial preparedness is a crucial contribution to the current literature, which has largely focused on the use of pre-determined measures, such as income, assets, or savings, to assess household financial well-being.

We find that three main factors impact financial fragility of middle-income households: family size, debt obligations, and financial literacy. Family size plays an important role because of committed household financial resources that are associated with children. Additionally, these households have a lot of debt. Though they own assets, such as homes and cars, these assets are often highly leveraged. Further, they are borrowing against themselves by taking out loans from retirement accounts or holding unpaid medical bills, and they are using high-cost borrowing methods to cope with emergency expenses. This finding demonstrates the importance of taking a holistic look at household balance sheets, considering more than just income and assets. Financial literacy is very low among financially fragile middle-income households, which is problematic when there are a lot of assets and debt to manage. To understand the causes of financial fragility, we need to understand households' capacity to manage debt and financial resources, and not just their level of debt.

For financially fragile households, a financial setback can lead to a reprioritization of expenses, with potentially adverse consequences for spending on things like children's education and health. This leads to increasing societal inequality, meaning that, if unchecked, financial fragility could heighten socioeconomic disparities among American families in the future. Our research also shows that being financially fragile lowers the probability of planning for retirement. Thus, understanding financial fragility is important not only to address the short-term effect of failing to cope with an emergency, but also to account for long-term consequences on financial well-being.

Our analysis will have important implications for practitioners and policy makers interested in improving the financial resilience of American families. An understanding of weaknesses in the financial capability of Americans is a first step to creating mitigating policies that can prevent financial setbacks. For instance, we find that being financially literate lowers the likelihood of being financially fragile, independent of level of educational attainment. Thus, policies can be implemented to provide financial education at the school, workplace, and community levels. Policies that address saving for retirement have traditionally targeted tax and non-tax incentives, such as pre-tax retirement

accounts. Our analysis indicates that incentivizing short-term personal saving in a similar way would help to build resilience and financial security.

Literature Review

Past research has focused on both objective and subjective measures of financial fragility. The former include many forms of liquidity or debt ratios to assess the coping capacity of households and individuals (Bi and Montalto, 2004; Brown and Taylor, 2008; Faruqui, 2008; Jappelli, Pagano, and di Maggio, 2013; Ampudia, Vlokhoven, and Żochowski, 2016). Smythe (1968) and Johnson and Widdows (1985) measure financial fragility as the sufficiency of liquid assets to cover three months' worth of living expenses in the event of an unexpected crisis.

Subjective measures of financial fragility include people's confidence level or their perceived ability to meet emergency expenses (Anderloni, Bacchiocchi, and Vandone, 2012). It is important to acknowledge the subtle shortcomings of empirical measures that evaluate households' existing asset levels to predict current or future fragility. There are vast differences in the sufficiency of these assets ranging from liquid/illiquid assets and stock/flow assets to the preferences that determine which assets are used for emergencies, which networks are tapped for borrowing purposes, and which expenditure categories are reduced when unexpected costs are faced.

Thus, Lusardi, Schneider, and Tufano (2011) presented a subjective metric that takes all of this into account when measuring financial fragility. This measure assesses the ability to cope with an unexpected expenditure or income shock by surveying respondents' capacity to come up with $2,000 in 30 days. The results of the research were striking: about 50% of Americans in 2009 reported that they were either absolutely or possibly unable to cope with a shock. While the incidence of such financial fragility was understandably higher among low-income groups, a substantial proportion of middle-class Americans were also found to be fragile.

Anderloni, Bacchiocchi, and Vandone (2012) have used a similar measure in their research by asking Italian households if they could immediately cope with an unexpected expense of €700.

Other related research on individual and household financial fragility has focused on equivalent measures in specific regions or countries: Estonia (Rõõm and Meriküll, 2017), Italy (Brunetti, Giardia, and Torricelli, 2016), the Euro area (Ampudia, Vlokhoven, and Żochowski, 2016), Europe (Christelis, et al., 2009), Britain (Del-Rio and Young, 2005), and Australia (Worthington, 2003).

Other studies have investigated sources of financial distress that influence financial fragility, such as the use of alternative financial services like pawn shops and payday loans (Skiba and Tobacman, 2009; Melzer, 2011) and levels of indebtedness (Christelis, et al., 2009; Jappelli, Pagano, and di Maggio, 2013). Moreover, Jappelli, Pagano, and di Maggio (2013) consider the influence of institutional factors on financial fragility. Specifically, they discuss the role of judicial enforcement, information sharing arrangements, and bankruptcy laws. More recently, Morduch and Schneider (2017) studied income and spending volatility as primary causes of financial fragility.

Financial Fragility Measure

Financial fragility is measured using responses to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" The $2,000 amount is reflective of a mid-size shock, such as an unexpected health shock, a major car repair, or an unanticipated legal expense—all categories of expenditure that can be commonplace in people's lives. The possible answers to the question are "I am certain I could come up with the full $2,000," "I could probably come up with $2,000," "I could probably not come up with $2,000," or "I am certain I could not come up with $2,000." Individuals who choose one of the last two options, i.e., they probably could not or certainly could not come up with the amount in 30 days, are categorized as financially fragile (Lusardi, Schneider, and Tufano, 2011). Respondents can also answer "do not know" or can refuse to answer.

The uniqueness of this scale is that it evaluates the coping ability of respondents over a month instead of immediately, and this allows individuals to consider the range of resources that they would access in an emergency. This question not only enables an assessment of the potential level of assets

and debt obligations but also helps to study more nuanced factors such as respondents' confidence level and expectations for future finances. An advantage of this measure is that it takes into account elements of a respondent's personal financial situation that are unobservable from outside the household, including the respondent's knowledge of existing and foreseeable payment obligations, the proportion of assets dedicated to dependents, and the respondent's assessment of what resources might be most easily available to cover an unexpected need.

Data Samples

In this paper, we examine respondents from the 2015 wave of the National Financial Capability Study (NFCS) who are in their prime working years, i.e., ages 25–60, and not retired. Those who are younger or older are excluded from the sample as their characteristics, financial behavior, and needs can be very different: people under 25 may be students with no labor income, while those over 60 may be retired and receiving Social Security benefits. The 25- to 60-year-old population can thus comprise a more homogenous sample.

Supported by FINRA Investor Education Foundation, the NFCS is a triennial survey first conducted in 2009 with the goal of assessing and establishing a baseline measure of financial capability among American adults. The NFCS has a large number of observations (27,564 American adults in 2015), allowing researchers to study population subgroups such as the one we examine here, namely financially fragile middle-income people age 25–60. Data from the NFCS provide insight into a broad array of aspects of personal finance. The NFCS comprises invaluable self-assessed measures of the burden of debt and financial fragility.[1] The 2015 wave included several questions available in two prior NFCS surveys (2009 and 2012), yet it also included new queries about several topics of key interest to our present research. In particular, it added several new questions about long-term debt and financial literacy related to debt and debt management. Additionally, and uniquely, it

[1] Some of these questions were designed in collaboration with one of the authors of this study.

also provides information about non-traditional methods of borrowing, such as payday loans, pawn shops, rent-to-own products, and auto title loans.

Our intention is to understand the relationship between financial fragility and demographic factors such as gender, age, ethnicity, marital status, and having children and socioeconomic variables like income, education, and employment status. Further, we examine the money management behavior and self-assessed financial situation of financially fragile households. The NFCS survey also asked a set of financial literacy questions, and responses to those questions enable us to assess respondents' knowledge and understanding of personal finance, specifically understanding of simple and compound interest, inflation, risk diversification, bond prices, and mortgage structures. We construct a financial literacy index based on the respondents' ability to answer three simple questions assessing knowledge of interest rates, inflation, and risk diversification (Lusardi and Mitchell, 2008). This indicator of financial literacy is included in our regression model to determine how financial literacy can affect individuals' ability to cope with emergency expenses. The text for the questions can be found in Appendix A.

To construct our analysis sample, we first extracted from the 2015 NFCS the set of 16,793 respondents age 25–60. Next, we excluded respondents for whom we did not have information about financial fragility, thus those responding "do not know" or who refused to answer. Our final sample for the regression analysis was composed of 16,174 respondents who were observationally comparable to the full sample (see Table B1 of Appendix B for descriptive statistics).

Empirical Findings

Characteristics of financial fragility in the working age population

Table 1 shows that many years after the financial crisis and during a time of economic expansion, 36% of Americans of working age cannot come up with $2,000 within a month to cover an emergency expense. Financial fragility is not only pervasive in the broad working-age population, but the share of financially fragile individuals is relatively constant across age groups. Thus, the expected

accumulation of wealth and experience over the life-cycle does not seem to contribute to lowering financial fragility rates at older ages.

Table 1 shows some of the descriptive statistics that provide the basis for our empirical work. We start by providing a stark finding: While fragility does fall with income, almost 30% of middle-income households (with household income in the range of $50,000 to $75,000) and 20% of those with income in the $75,000–$100,000 range are financially fragile. Note that the question asks about the coping capacity for an expense of a fixed dollar amount, so that amount ($2,000) is a relatively lower share of a large paycheck compared to the smaller paycheck that would be associated with a lower wage. These statistics show that having higher income does not necessarily equate to being financially resilient. Therefore, we focus our analysis on the middle income group and also analyze findings across income groups.

The data also show a strong link between financial fragility and educational attainment. When it comes to financial fragility, there seems to be an education divide: those without a bachelor's degree are much more financially fragile than those with a bachelor's degree (Table 1). Even after we control for many demographic variables in Table 2, the F-test shows that the estimated coefficients of our regression analysis are not significantly different for bachelor's and graduate degrees, but they are significantly different from the coefficient for people with less than a college degree. Of course, education can be a proxy for income, but the estimates shown in Table 2, where we consider many demographic variables together, shows that education has an impact on financial fragility above and beyond that of income.

There is also a strong gender difference in financial fragility: over 40% of women stated that they could probably not or definitely not come up with $2,000 within a month, whereas the percentage of financially fragile men is below 30% (Table 1). Women continue to be more likely to be financially fragile even after accounting for many demographic characteristics (Table 2). Similarly, African Americans are much more likely to be financially fragile, and estimates in Table 2 show that this finding is not simply due to differences in education, income, or other demographic characteristics.

Other characteristics we would like to draw attention to are age, family structure, and financial literacy. Another stark finding that can be seen in Table 2 is the greater likelihood for the middle-age group (35–44) to be financially fragile. This cannot simply be an effect of income (for people early in their careers or at mid-career) because we control for income in the multivariate regressions. Thus, there are other factors influencing the likelihood of financial fragility for middle-aged individuals. In fact, one variable that is significant in all regressions is the number of financially dependent children, likely because costs related to children (education and child care) can have a large impact on family resources.

Another variable that matters is financial literacy; there is a sharp difference in financial literacy between those who are financially fragile and those who are not. Strikingly, only 22% of financially fragile households demonstrate comprehension of three basic financial literacy concepts versus 76% of those who are not financially fragile (Table 1). The effects of financial literacy continue to hold even when accounting for income and education (Table 2) and we will note below why being able to manage resources—both assets and debt—is critically important in shielding oneself from shocks.

Table 1 here

Table 2 here

The impact of family size

In Tables 3 and 4 we study in more detail the impact of family size and its importance across different income groups. With living costs and tuition fees increasing, raising children can require a lot of household financial resources. Our data show that households with more children are more likely to be financially fragile. This holds for all income categories and points to the financial obligations that arise with a growing family (Table 3). When comparing financially fragile households across income groups, we find that financially fragile middle- and high-income households are more likely to have more children. This is in line with the overall observation that households with more income have

more children. However, it also helps explain why middle-income households are financially fragile. Interestingly, when controlling for other demographic variables in Table 4, we find that an increasing number of financially dependent children does significantly increase the incidence of financial fragility for middle- and high-income households but has no effect on families in the lower income bracket (less than $50K). Even though the difference in the estimated coefficients for financially dependent children in Table 4 for middle- and high-income households is fairly high, the chi-squared test shows the two estimates (0.021 and 0.012, respectively) are not significantly different.

Moreover, the regression results shown in Table 4 indicate that married couples are significantly less likely to be financially fragile, as they have the possibility of earning two incomes and are able to financially support each other. The double income argument might also yield to the significantly higher proportion of middle-income households being married compared to the lower income group (<$50K). However, among middle-income households, a similar proportion of married couples is financially fragile versus non-fragile, which might be positively linked to the larger number of children in middle-income financially fragile families.

Table 3 here

Table 4 here

The impact of debt

Given the importance of financial resources and the management of financial resources, in Table 5 we look at some proxy indicators, such as capacity to save and debt holdings, and in Table 6, we look in more detail at the assets and debt holdings across income groups of financially fragile respondents. The statistics shown in Table 5 indicate that a sizeable fraction of financially fragile households are not able to save but actually spend more than their income, thus accumulating debt. This fraction is high even for higher income brackets, showing again that higher income does not necessarily buy more financial security. Specifically, across all income groups an equal fraction (of around 30%) of financially fragile respondents indicated that over the past year they spent more than they earned.

Most of the financially fragile households find it difficult to pay their bills; even for higher income groups, expenses are high enough to create financial strain. What Table 5 also shows is that it is important to look at debt and debt holdings, as a large majority of financially fragile families (as many as 70% in the middle-income as well as higher-income group) state that they have too much debt. Notably, the percentage of people in the middle-income group feeling overindebted is significantly higher compared to the percentage of households earning less (<$50K). This indicates that the burden of debt borne by households in the middle- and high-income groups highly contributes to the likelihood of being financially fragile. As shown in Hasler, Lusardi, and Oggero (2018), financial fragility is an indicator not only of lack of assets but also of high debt. We turn to examine the components of household balance sheets shown in Table 6.

Table 5 here

The NFCS does not provide information about net wealth and the value of assets and debt. However, it does provide information on which assets and debt households have, and it is possible to infer a lot about households' balance sheets from that information. Moreover, the NFCS includes detailed information on financial management behavior, which is important when assessing someone's ability to cope with financial shocks. In Table 6, we provide information on the assets, debt, and proxies for debt management across income groups of financially fragile families. There are sharp differences across income groups in capacity to save and in household asset holdings. For example, home ownership is twice as high among those who have income greater than $50K than those whose income is lower than $50K. Similarly, retirement saving is strongly correlated with income. Those with higher income (higher than $50K) are two to three times more likely to have a retirement account. And consistent with the impact of children demonstrated above, financially fragile heads of households are saving not only for their own retirement but also for their children's education; about 1 in 4 families in the middle-income group have a college savings fund.

But if financially fragile families own a home and car, have retirement accounts and college savings funds, and carry a credit card, they are often leveraged on each of these assets, including their own human capital. Table 6 shows that financially fragile families also have debt, and that debt does not decrease, but actually increase with income. Many financially fragile families not only have a mortgage on their house but have tapped into their home's value via a home equity loan. Many carry a loan on their car, and this percentage increases with income. Even though we include all age groups up to the age of 60, many households also have student loans. Thus, having assets does not prevent middle-income households from being financially fragile as their debt loads are significantly higher as well. And even using a house as collateral to cope with an emergency expense requires some planning because for example a home equity line of credit needs to be set up well ahead of a financial hardship.

Moreover, financially fragile families are borrowing against themselves. For example, more than 40% of families in the middle-income group have unpaid medical bills. This percentage is significantly higher compared to the fraction with unpaid medical bills among the households earning less than $50K and more than $75K. One-third of the families in the middle-income group are late with mortgage payments (33.7%) and a similar fraction (33.8%) is late with student loan payments. Interestingly, these percentages do not vary much across financially fragile households of different income groups. More than one-third (36%) overdraw from their checking accounts. This is significantly higher than the fraction of lower-income households that reported overdrawing their checking accounts (31%). While they have retirement accounts, financially fragile families are tapping into those accounts and depleting the savings devoted to financial security after retirement; more than 20% of middle-income families had taken a loan from their retirement account in the year prior to the survey and more than 13% had taken a hardship withdrawal. Compared to the lower income group, financially fragile middle-income households are significantly more likely to borrow from their retirement accounts and, thus, borrow against their long-term retirement savings. This

speaks to the importance of looking at saving in a holistic way, i.e., including debt too, as those who are financially fragile turn to their retirement savings when hit by an emergency.

In Table 6, evidence can be seen that financially fragile families borrow or access resources in an expensive way, paying high interest rates and fees to access liquidity. When looking at the use of credit cards—most financially fragile families have credit cards—we find that financially fragile families (close to 70%) tend to pay the minimum only, go over the limit, pay late, or use the cards for cash advances—all behaviors that are likely to generate high future payments. Most important, a high proportion of financially fragile families (almost 40%) use alternative financial services, such as payday lenders and pawn shops. These loans are likely charging interest rates well above 100%. Interestingly, we find little differences across income groups; financially fragile households use high-cost borrowing methods in a similar way independent of their income level.

Overall, middle-income households have a lot of assets, but these assets are highly leveraged. While collateralized debt might incur lower fees, the fees that result from credit card mismanagement and the use of alternative financial services--both common among financially fragile households--tend to be very high. This again indicates the importance of taking a holistic look at household balance sheets, beyond income and assets.

Table 6 here

The importance of financial literacy

As argued earlier, it is not only lack of resources but also the capacity to manage financial resources that may be important to our understanding of financial fragility, in particular among middle-income families that face increasing education costs for themselves and their children and whose mortgage and car payments can account for a sizeable share of their income. As already noted and as shown in Tables 1 and 2, financial literacy levels of financially fragile families are very low, dangerously so for families who are facing many financial demands. The information in Table 7 helps us take a closer look at financial literacy levels of families who are and are not financially fragile across income

groups. The table shows that financial literacy is very low overall, even among those who have high income (more than $75K) and those who are not financially fragile. However, there is a sharp difference in the level of financial knowledge between those who are financially fragile and those who are not, and this finding holds true across income groups. For example, only 22% of middle-income individuals who are financially fragile can correctly answer three simple questions assessing knowledge of interest rates, inflation, and risk diversification; 33% of those who are not financially fragile can do so. Thus, middle-income households, with a lot of assets and debt to manage, do not only show low financial knowledge, also those who struggle the most do know significantly less than those who are not financially fragile.

Knowledge of single financial concepts is also low. What is worrisome is that while many financially fragile families carry debt, knowledge of interest compounding in the context of debt seems very low: only about 40% of financially fragile respondents in the middle-income group know how long it takes for debt to double if one were to borrow at a 20% interest rate. And while many have retirement accounts, not even half of the financially fragile households in the middle-income group know about basic asset pricing.

Moreover, as shown in Table 4, financially literate households are significantly less likely to be financially fragile, and this holds even after controlling for socioeconomic factors, including education, and the effect is significant at all income levels.

Table 7 here

Does financial fragility matter for middle income?

While all of the analysis so far has shown that a substantial share of middle-income families are financially fragile, one important question is whether financial fragility matters. We have already shown that financially fragile families are often in financial distress: they miss payments and rely on alternative financial services, and these behaviors can have implications on the well-being of families in the short term. For example, many surveys show that families experience regular financial worry

and suffer from stress. There is also evidence that employers have started offering financial wellness programs as a benefit, in addition to offering pension and health plans—further evidence that people need help managing their finances.

In our data we look at the importance of financial fragility by examining its impact on retirement planning. We do so for three reasons. First, retirement planning is a strong predictor of wealth, as shown by Lusardi and Mitchell (2007). Because we do not have information on wealth in the NFCS, we use as a proxy for wealth the information on whether individuals have given any thought to what they need for their retirement. Second, given the income replacement rate offered by Social Security, workers today need to put aside some additional savings to ensure their financial security after they stop working. Third, retirement planning is a good indicator of how savvy people are about their resources over the life cycle.

The estimates reported in Table 8 show that those who are financially fragile are much less likely to plan for retirement. Even after accounting for many demographic characteristics, the middle-income families who are financially fragile are 16 percentage points less likely to plan for retirement. Thus, financial fragility can be a detriment in both the short and long term. Note also that both education and financial literacy matter for retirement planning, adding evidence that while income and wealth are important in today's economy, so is management of income and resources.

Table 8 here

Conclusion

A household's capacity to cope with unexpected expenses is a crucial component of financial well-being. A lack of such preparedness is like balancing on a beam—an unexpected financial hardship can shake one off, and it may be hard to regain footing. Lusardi et al. (2011) introduced an innovative measure of the capacity to cope with shocks, which they termed financial fragility, by assessing U.S. households' capacity to come up with $2,000 in 30 days. In the aftermath of the Financial Crisis of 2007–09, almost 50% of the U.S. population could be classified as financially fragile. Using the same

measure to analyze data collected in 2015, we find that more than one-third of the U.S. population is financially fragile. Such high incidence of financial fragility is concerning when we consider that the crisis occurred ten years ago and that the economy has been recovering steadily.

Our measure of financial fragility is multifaceted and has an advantage over other measures of financial resilience. By incorporating individuals' assessment of their perceived capacity to come up with a specific amount within a given time frame, we are able to observe a variety of coping mechanisms, beyond having savings, including tapping into a network of family and friends, using mainstream or alternative credit services, and selling possessions.

Data from the 2015 National Financial Capability Study (NFCS) show that financial fragility is not only persistent but is also prevalent among a broad cross-section of the population. While low-income households are the least able to cope with emergency expenses, middle-income households also struggle with financial hardships. Specifically, while financial fragility does fall with income, almost 30% of middle-income households (with income in the range of $50–$75K) and 20% of those with income in the $75,000–$100,000 range are financially fragile. To better understand financial fragility in the U.S. among middle-income households, we use data from the most recent wave of the NFCS to identify the major factors associated with fragility, and the long-term implications of financial fragility for American middle-income households.

We find that three main factors impact financial fragility of middle-income households: family size, debt obligations, and financial literacy. First, family size is important because of committed household financial resources that are associated with children, and middle-income households are more likely to have more financially dependent children. Second, middle-income households have a lot of outstanding debt, which we find increases, with income. They do own assets, but these assets are highly leveraged. Moreover, assets such as a house cannot be readily used as collateral to cope with emergency expenses, because tapping into the equity in a home requires advance planning, and such planning requires skills and knowledge, which are lacking among financially fragile households. Thus, the illiquid nature of certain assets can impose restrictions on

the coping ability of households that are facing an immediate financial emergency. Further, financially fragile households are borrowing against themselves by holding unpaid medical bills and tapping into retirement savings. In fact, middle-income households are more likely to take out loans from their retirement accounts than households that earn less. We find that an equivalent but concerningly high fraction of financially fragile households across all income groups pays high interest rates and fees to access liquidity, such as via auto title or payday loans, pawn shops, or rent-to-own stores. These findings indicate the importance of gaining a holistic understanding of households' financial obligations and coping mechanisms, which can tell us much more than a basic knowledge of income and assets. Third, financial literacy is very low among financially fragile middle-income households, even though they have a lot of assets and debt to manage. Thus, it is not only a household's level of debt but also its capacity to manage debt and financial resources that is important to our understanding of financial fragility. Moreover, we show that financial fragility has long-term consequences as financially fragile households are much less likely to plan for retirement.

Given that the U.S. economy has been slowly recovering from the Great Recession, the prevalence of weak personal finances is concerning and points to the need for programs and initiatives that can make households more resilient to shocks. Over the years, saving for the long term has been promoted in many forms, such as tax incentives for home purchases or for contributions to retirement plans. Institutionalizing saving for the short term could be another way to incentivize people to hold precautionary savings.

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Table 1: Descriptive results for full sample

	Non-fragile	Fragile	Don't Know/Refuse to Answer
Total working age sample	60.21	35.70	4.09
Household income			
<$25K	26.77	66.33	6.91
$25–50K	48.16	47.00	4.83
$50–75K	68.75	27.61	3.64
$75–100K	78.52	19.20	2.29
>$100K	90.36	7.85	1.79
Age			
25–34	58.98	37.31	3.70
35–44	60.60	34.91	4.49
45–60	60.82	35.07	4.10
Highest degree obtained			
High School Or Less	46.13	47.96	5.91
Some College, No Degree	56.96	39.19	3.85
Bachelor's Degree	74.00	23.01	2.99
Graduate Degree	81.98	15.47	2.55
Gender			
Male	66.69	29.43	3.88
Female	53.91	41.80	4.29
Race/Ethnicity			
White Non-Hispanic	62.60	33.94	3.46
African American, Non-Hispanic	45.90	47.41	6.69
Hispanic	59.13	36.96	3.91
Asian, Non-Hispanic	70.47	23.72	5.82
Other, Non-Hispanic	52.04	43.15	4.81
Marital status			
Not married	49.81	45.38	4.82

Married	68.20	28.27	3.53
Financially dependent children			
0	57.35	37.98	4.67
1	62.63	33.87	3.49
2	65.73	31.09	3.18
3	61.01	35.23	3.76
4 Or More	55.69	39.46	4.85
Work status			
Not employed	38.96	54.38	6.66
Employed	68.70	28.24	3.06
Financial literacy			
Not financially literate	53.16	41.55	5.29
Financially literate (first three questions correct)	76.25	22.41	1.34
Total Observations	10,453	5,721	619

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60; all estimates are weighted. Total observations are 16,793. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they certainly or probably could come up with $2,000. Married is a dummy variable taking value 1 if the respondent is married, but not divorced, separated or widowed, and 0 otherwise. Income represents household annual income from all sources, such as wages, tips, investment income, public assistance, and retirement plans. Financial literacy is a dummy variable with value 1 if the respondent answered the "Big 3" financial literacy questions correctly (interest, inflation, risk diversification).

Table 2: Multivariate regression models for full sample

Dependent variable: Financial fragility (dummy = 1 for financially fragile respondents)	Model 1	Model 2	Model 3
Income (omitted category: <$25K):			
$25–50K	-0.211***	-0.171***	-0.169***
	(0.014)	(0.014)	(0.014)
$50–75K	-0.398***	-0.344***	-0.341***
	(0.014)	(0.015)	(0.015)
$75–100K	-0.476***	-0.412***	-0.407***
	(0.015)	(0.016)	(0.016)
>$100K	-0.571***	-0.497***	-0.485***
	(0.014)	(0.015)	(0.015)
Age (omitted category: 25-34):			
35-44	0.031***	0.032***	0.036***
	(0.011)	(0.011)	(0.011)
45-60	0.009	0.008	0.017*
	(0.010)	(0.010)	(0.010)

Sex:			
Female	0.079***	0.059***	0.051***
	(0.008)	(0.008)	(0.008)
Race or ethnicity (omitted category: White):			
African American, non-Hispanic	0.061***	0.055***	0.048***
	(0.013)	(0.013)	(0.013)
Hispanic	0.012	0.007	0.003
	(0.013)	(0.013)	(0.013)
Asian, non-Hispanic	-0.036*	-0.042**	-0.044**
	(0.019)	(0.019)	(0.018)
Other, non-Hispanic	0.036*	0.033	0.032
	(0.021)	(0.021)	(0.021)
Education (omitted category: High school or less):			
Some college, no degree	-0.044***	-0.034***	-0.027**
	(0.011)	(0.011)	(0.011)
Bachelor's degree	-0.113***	-0.096***	-0.082***
	(0.012)	(0.012)	(0.012)
Graduate degree	-0.120***	-0.100***	-0.083***
	(0.013)	(0.013)	(0.013)
Household characteristics:			
Married	-0.014	-0.026***	-0.026***
	(0.010)	(0.010)	(0.010)
Financially dependent children	0.017***	0.012***	0.011***
	(0.004)	(0.004)	(0.004)
Employment status:			
Employed full time, part time or self employed		-0.094***	-0.094***
		(0.011)	(0.011)
Income shock		0.122***	0.119***
		(0.010)	(0.010)
Financial literacy:			
First three questions correct (interest, inflation, risk)			-0.056***
			(0.009)
Constant	0.595***	0.617***	0.633***
	(0.019)	(0.020)	(0.021)
Observations	16,174	16,174	16,174
R-squared	0.232	0.252	0.254

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile is they reported that they certainly or probably could come up with $2,000. All respondents who chose "do not know" or "refuse to answer" have been excluded as there is not sufficient information to determine whether they are financially fragile. Married is a dummy variable taking value 1 if the respondent is married, but not divorced, separated or widowed, and 0 otherwise. Income represents household annual income from all sources, such as wages, tips, investment income, public assistance, and retirement plans. Income shock is a dummy variable taking value 1 if the respondent reported the household experienced a large drop in income in the previous 12 months, which they did not expect; and 0 if the respondent reported the household did not experience a large drop in income. The respondents who did not answer, or answered "I don't know" were included as control as a separate dummy in the regression (coefficients are not reported in the table). Financial literacy is a dummy variable taking value 1 if the respondent answered correctly the questions on interest rate, inflation and risk diversification. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Family size of financially fragile households by income groups

Income	<$50K		$50-$75K		>$75K	
Financial fragility measure	Non-fragile	Fragile	Non-fragile	Fragile	Non-fragile	Fragile
Household structure						
Married	38.85	34.50	63.92	66.34	80.19	78.19
Financially dependent children						
0	58.91	58.56	47.76	38.10	38.82	34.30
1	18.49	18.00	21.47	22.88	22.37	21.13
2	13.14	13.58	19.69	22.53	26.00	26.11
3	5.91	6.25	7.25	10.30	8.85	10.44
4 or more	3.55	3.62	3.83	6.19	3.96	8.02
Total Observations	2,875	3,999	2,516	1,003	5,062	719

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60 who are financially fragile; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they certainly or probably could come up with $2,000. The "Don't know" responses for the three variables were excluded from the statistics.

Table 4: Multivariate regression by income

Dependent variable: Financial fragility (dummy = 1 for financially fragile respondents)	Income <$50K	Income $50-$75K	Income >$75K
Age (*omitted category: 25-34):*			
35-44	0.053***	0.038*	-0.003
	(0.018)	(0.023)	(0.015)
45-60	0.036**	-0.013	-0.017
	(0.016)	(0.022)	(0.015)
Sex:			
Female	0.068***	0.056***	0.028**
	(0.014)	(0.019)	(0.011)
Race or ethnicity (omitted category: White):			
African American, non-Hispanic	0.047**	0.029	0.066***
	(0.018)	(0.032)	(0.024)
Hispanic	-0.009	0.010	0.009
	(0.021)	(0.028)	(0.017)
Asian, non-Hispanic	-0.118***	-0.040	0.013
	(0.037)	(0.037)	(0.022)
Other, non-Hispanic	0.045	-0.028	0.043
	(0.031)	(0.048)	(0.033)

Education (omitted category: High school or less):			
Some college, no degree	-0.018	-0.033	-0.058***
	(0.015)	(0.025)	(0.020)
Bachelor's degree	-0.112***	-0.105***	-0.086***
	(0.021)	(0.027)	(0.020)
Graduate degree	-0.114***	-0.144***	-0.102***
	(0.032)	(0.030)	(0.020)
Household characteristics:			
Married	-0.071***	-0.036*	-0.025*
	(0.015)	(0.020)	(0.014)
Financially dependent children	-0.004	0.021**	0.012**
	(0.007)	(0.009)	(0.005)
Employment status:			
Employed full time, part time or self employed	-0.155***	-0.106***	-0.024
	(0.014)	(0.025)	(0.019)
Income shock	0.128***	0.151***	0.105***
	(0.014)	(0.023)	(0.017)
Financial literacy:			
First three questions correct (interest, inflation, risk)	-0.097***	-0.046**	-0.043***
	(0.017)	(0.019)	(0.010)
Constant	0.578***	0.306***	0.183***
	(0.030)	(0.049)	(0.036)
Observations	6,874	3,519	5,781
R-squared	0.085	0.075	0.061

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile is they reported that they certainly or probably could come up with $2,000. All respondents who chose "do not know" or "refuse to answer" have been excluded as there is not sufficient information to determine whether they are financially fragile. Married is a dummy variable taking value 1 if the respondent is married, but not divorced, separated or widowed, and 0 otherwise. Income represents household annual income from all sources, such as wages, tips, investment income, public assistance, and retirement plans. Income shock is a dummy variable taking value 1 if the respondent reported the household experienced a large drop in income in the previous 12 months, which they did not expect; and 0 if the respondent reported the household did not experience a large drop in income. The respondents who did not answer, or answered "I don't know" were included as control as a separate dummy in the regression (coefficients are not reported in the table). Financial literacy is a dummy variable taking value 1 if the respondent answered correctly the questions on interest rate, inflation and risk diversification. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Self-assessment of financial situations of financially fragile households by income groups

	Income		
Financially fragile respondents	<$50K	$50-75K	>$75K
Spending more than income	28.30	28.97	30.38
Very or somewhat difficult to pay bills	86.10	80.38	75.19
Have too much debt	61.54	70.10	71.01

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60 who are financially fragile; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they certainly or probably could come up with $2,000. The "Don't know" responses for the three variables were excluded from the statistics.

Table 6: Managing personal finances of financially fragile households by income groups

		Income	
Financially fragile respondents	<$50K	$50-75K	>$75K
Homeowner	32.60	56.62	69.70
Home mortgage*	55.31	78.86	86.07
Home equity loan*	7.41	17.37	20.86
Late with mortgage payments*	35.51	33.70	32.95
Auto loan*	21.91	46.45	56.37
Human capital			
College degree	12.82	22.69	38.48
Student loan	32.88	40.25	44.51
Late with student loan payments	39.85	33.86	31.69
Child college fund	15.02	23.94	31.87
Retirement savings (DB, DC, IRA)	30.13	67.85	82.53
Loan from retirement account*	12.62	20.27	25.11
Hardship withdrawal from retirement account*	12.95	13.64	16.98
Other borrowing from oneself			
Unpaid medical bills	37.99	41.49	34.94
Overdrawing from checking account*	31.02	36.03	38.54
Credit card (at least one)	50.76	77.22	84.59
Expensive credit card behavior*	67.67	69.50	67.18
Use of alternative financial services	41.52	37.78	37.31

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60 who are financially fragile; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they certainly or probably could come up with $2,000. *Indicates statistics are conditional on having the related assets.

Table 7: Financial literacy of financially fragile and non-fragile households by income groups

Income	<$50K		$50-$75K		>$75K	
Financial fragility measure	Non-fragile	Fragile	Non-fragile	Fragile	Non-fragile	Fragile
Financial literacy:						
First three questions correct (interest, inflation, risk)	25.96	16.65	33.30	22.54	49.59	30.04
Interest question correct	82.66	81.87	84.71	84.25	90.38	83.81
Inflation question correct	66.14	68.12	72.05	70.29	79.34	71.02
Risk question correct	74.49	78.85	79.93	76.71	85.52	78.41
Bond question correct	40.06	30.65	43.58	36.83	53.34	44.25
Compound interest question correct	43.82	37.29	47.50	41.37	50.30	36.84
Mortgage question correct	89.10	87.84	91.01	89.62	94.16	91.47
Total Observations	2,875	3,999	2,516	1,003	5,062	719

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60 who are financially fragile; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they certainly or probably could come up with $2,000. The "Don't know" responses for the three variables were excluded from the statistics.

Table 8: Retirement planning regression results for middle-income households

Dependent variable: Retirement Planning (dummy = 1 for those who think about how much to save before retiring)	Income $50-$75K
Financial fragility	-0.158***
	(0.022)
Age (*omitted category: 25-34):*	
35-44	0.005
	(0.026)
45-60	0.002
	(0.024)
Sex:	
Female	-0.013
	(0.021)
Race or ethnicity (omitted category: White):	
African American, non-Hispanic	0.049
	(0.034)
Hispanic	-0.028
	(0.030)
Asian, non-Hispanic	-0.038
	(0.045)
Other, non-Hispanic	-0.120**
	(0.053)

Education (omitted category: High school or less):	
Some college, no degree	0.038
	(0.026)
Bachelor's degree	0.131***
	(0.029)
Graduate degree	0.122***
	(0.035)
Household characteristics:	
Married	0.034
	(0.022)
Financially dependent children	0.008
	(0.009)
Employment status:	
Employed full time, part time or self employed	0.071***
	(0.026)
Income shock	0.106***
	(0.024)
Financial literacy:	
First three questions correct (interest, inflation, risk)	0.115***
	(0.022)
Constant	0.323***
	(0.054)
Observations	3,386
R-squared	0.066

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60 with an annual household income of $50-$75K; all estimates are weighted. People are said to plan for retirement if they report that they tried to figure out how much they need to save for retirement. Fragile is a dummy variable taking value 1 if people reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile is they reported that they certainly or probably could come up with $2,000. All respondents who chose "do not know" or "refuse to answer" have been excluded as there is not sufficient information to determine whether they are financially fragile. Income represents household annual income from all sources, such as wages, tips, investment income, public assistance, and retirement plans. Married is a dummy variable taking value 1 if the respondent is married, but not divorced, separated or widowed, and 0 otherwise. Income shock is a dummy variable taking value 1 if the respondent reported the household experienced a large drop in income in the previous 12 months, which they did not expect; and 0 if the respondent reported the household did not experience a large drop in income, the respondent did not answer, or answered "I don't know." Financial literacy is a dummy variable taking value 1 if the respondent answered correctly the questions on interest rate, inflation and risk diversification. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix A

Text for financial literacy questions as asked in the 2015 NFCS

1. **Interest rate**

Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?

- More than $102
- Exactly $102
- Less than $102
- Don't know
- Prefer not to say

2. **Inflation**

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- More than today
- Exactly the same
- Less than today
- Don't know
- Prefer not to say

3. **Risk diversification**

Buying a single company's stock usually provides a safer return than a stock mutual fund.

- True
- False
- Don't know
- Prefer not to say

Appendix B

Table B1: Descriptive statistics for 2015 NFCS respondents age 25-60 and our analysis sample

	Full Sample (incl. DNK) mean	Analysis Sample (excl. DNK) mean
First three questions correct (interest, inflation, risk)	0.3054	0.3141
male	0.4929	0.4940
female	0.5071	0.5060
White non-Hispanic	0.6304	0.6346
Black non-Hispanic	0.1197	0.1165
Hispanic (any race)	0.1690	0.1693
Asian, non-Hispanic	0.0569	0.0559
Other, non-Hispanic	0.0239	0.0237
Age 25-34	0.2996	0.3008
Age 35-44	0.2685	0.2674
Age 45-60	0.4319	0.4318
Income <$25K	0.2090	0.2029
Income $25-50K	0.2517	0.2498
Income $50-75K	0.2128	0.2138
Income $75-100K	0.1380	0.1406
Income >$100K	0.1885	0.1930
High school or less	0.2670	0.2619
Some college, no degree	0.4257	0.4267
Bachelor's degree	0.1936	0.1958
Graduate degree	0.1137	0.1156
Married	0.5657	0.5690
Single	0.3028	0.2992
Divorced or separated	0.1161	0.1164
Widowed	0.0155	0.0154
Employed full time, part time or self employed	0.7147	0.7224
unemployed or temp laid off	0.0764	0.0733
homemaker, full-time student, sick/disabled	0.2089	0.2044
Observations	16,793	16,174

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they certainly or probably could come up with $2,000. Married is a dummy variable taking value 1 if the respondent is married, but not divorced, separated or widowed, and 0 otherwise. Income represents household annual income from all sources, such as wages, tips, investment income, public assistance, and retirement plans. Financial literacy is a dummy variable with value 1 if the respondent answered the "Big 3" financial literacy questions correctly (interest, inflation, risk diversification).

Table B2: Descriptive statistics of financially fragile households by income groups

	Income				
Financially fragile respondents	<$25K	$25-50K	$50-75K	$75-100K	>$100K
Age					
25-34	0.3032	0.3473	0.3180	0.2659	0.1988
35-44	0.2227	0.2603	0.3023	0.3669	0.3100
45-60	0.4741	0.3924	0.3797	0.3672	0.4912
Highest degree obtained					
High School Or Less	0.4312	0.3448	0.3081	0.2563	0.1732
Some College, No Degree	0.4743	0.4875	0.4650	0.3775	0.4086
Bachelor's Degree	0.0729	0.1258	0.1698	0.2406	0.2171
Graduate Degree	0.0215	0.0419	0.0571	0.1256	0.2011
Gender					
Male	0.4223	0.3555	0.4129	0.4394	0.5775
Female	0.5777	0.6445	0.5871	0.5606	0.4225
Race/Ethnicity					
White Non-Hispanic	0.5892	0.5779	0.6428	0.6141	0.6665
African American, Non-Hispanic	0.1963	0.1567	0.1102	0.1132	0.1042
Hispanic	0.1545	0.1972	0.1840	0.1789	0.1461
Asian, Non-Hispanic	0.0234	0.0404	0.0480	0.0673	0.0596
Other, Non-Hispanic	0.0366	0.0278	0.0151	0.0266	0.0236
Household structure					
Married	0.2216	0.4897	0.6634	0.7440	0.8497
Financially dependent children	0.3256	0.5185	0.6190	0.6226	0.7187
Work status					
Employed	0.3713	0.6401	0.6889	0.8002	0.8777
Financial literacy					
Financially literate (first three questions correct)	0.1565	0.1782	0.2254	0.2601	0.3724
Total Observations	2,108	1,891	1,003	456	263

Note: All data are from the 2015 NFCS dataset. Sample restricted to non-retired individuals age 25-60; all estimates are weighted. People are classified as financially fragile if they reported that they certainly or probably could not come up with $2,000, in response to the following question: "How confident are you that you could come up with $2,000 if an unexpected need arose within the next month?" People are classified as not financially fragile if they reported that they

certainly or probably could come up with $2,000. Married is a dummy variable taking value 1 if the respondent is married, but not divorced, separated or widowed, and 0 otherwise. Financially dependent children is a dummy variable with value 1 if there are one or more financially dependent children living in the same household and 0 otherwise. Income represents household annual income from all sources, such as wages, tips, investment income, public assistance, and retirement plans. Financial literacy is a dummy variable with value 1 if the respondent answered the “Big 3” financial literacy questions correctly (interest, inflation, risk diversification).

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