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The Great Recession, Public Transfers, and Material Hardship

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Abstract

Economic downturns lead to lost income and increased poverty. Although high unemployment almost certainly also increases material hardship, and government transfers likely decrease hardship, the first relationship has not yet been documented and the second is poorly understood. We use data from five waves of the Fragile Families and Child Well-being Study to study the relationships between unemployment, government transfers, and material hardship. The latest wave of data was collected during the Great Recession, the worst recession since the Great Depression, providing a unique opportunity to look at how high unemployment rates affect the well-being of low income families. We find that the unemployment rate is associated with increased overall material hardship, difficulty paying bills, having utilities disconnected, and with increased usage of TANF, SNAP, UI and Medicaid. If not for SNAP, food hardship might have increased by twice the amount actually observed.

Keywords

Material Hardship; Unemployment; Recession; Public Transfers

The Great Recession that began in December, 2007 and officially ended in June, 2009 was one of the worst recessions in the US since the Great Depression (NBER, 2010). Among families in the lowest 10 percent of the income distribution, estimates from the Current Population Survey show that unemployment rates were as high as 31 percent in October to December 2009. In the second lowest income decile, unemployment was almost 20 percent (Sum and Khatiwada, 2010). High unemployment rates are likely to influence the health and well-being of low income families. In addition to lost income and increased poverty due to unemployment, low-income families are likely to experience other material hardships as a result of the economic downturn.

Research that has focused on material hardships has generally looked at the relationship between poverty or income and the occurrence of hardship (Sullivan, Turner, and Danziger, 2008; Iceland and Bauman, 2007). This paper focuses on the association between unemployment and material hardship using data from the first five waves of the Fragile Families and Child Wellbeing Study (Fragile Families). These data are uniquely suited to

looking at the effects of unemployment as the most recent data collection (May 2007 to February 2010) coincided with the Great Recession. To our knowledge, it is the first paper to examine the effect of the unemployment rate on material hardship, and it is one of the few studies to be able to exploit longitudinal data in order to control for many potential confounders. We examine the effect of the unemployment rate on a summary measure of material hardship as well as particular hardships, including: food hardship, inability to pay bills, housing insecurity, unmet medical needs, and utilities cut off. We also look at the association between the unemployment rate and the use of government transfer programs. Our study finds that the unemployment rate is related to the summary measure of material hardship, inability to pay bills, and having utilities cut off. We also find a number of government transfer programs are associated with the unemployment rate: the Supplemental Nutrition Assistance Program (SNAP), unemployment insurance (UI), Temporary Assistance for Needy Families (TANF), and Medicaid. Finally, we combine our estimates of the effect of unemployment on hardship and transfer programs with estimates of the relationship between transfer programs and hardship that are not plagued by reverse causality, to develop an estimate of the hardship mitigating effects of transfer programs during the Great Recession.

Prior Literature

Unemployment and Material Hardship

A large literature relates the business cycle to measures of economic wellbeing. Many studies focus specifically on the unemployment rate and poverty, income inequality, and family income (Blank and Blinder, 1986; Blank 1989, 1993; Cutler and Katz, 1991; Blank and Card, 1993; Tobin, 1994; Haveman and Schwabish 2000; Freeman, 2001; Hoynes, 2002; Gundersen and Ziliak, 2004). These studies generally find that increased unemployment rates are associated with poorer economic outcomes. For example, Rebecca Blank and David Card (1993) find that a rise in the unemployment rate is associated with an increase in the number of weeks unemployed, and with decreases in the number of weeks employed, real average weekly earnings, and mean earnings. Despite the large literature that looks at poverty and income measures, few studies look at the effect of changes in the business cycle on material hardship.

Material hardship is a consumption based indicator of economic well being that is designed to capture forms of foregone consumption that threaten health and well being, such as going without food, housing, or needed medical care. Many economists believe that consumption based indicators of economic well-being are superior to income based measures (Citro and Michael, 1995). Measures of income do not always fully capture all the resources that families have to make ends meet. In addition, other sources of income such as government transfers, wealth, and the ability to draw on credit or free services may also aid families in avoiding hardships. Measures of consumption are likely to better capture other sources of income. Besides capturing the effects of economic resources that income measures may miss, hardship measures are also heuristically attractive because they measure concrete adversities. Measures of material hardship can provide some perspective on what it means to be poor by measuring families' living conditions (Federman et al, 1996). Some researchers have suggested that the general American public is more interested in understanding whether families can obtain basic necessities rather than whether they have a certain level of income (Mayer and Jencks, 1998; Rector, Johnson, and Youssef, 1999; Heflin, Sandberg, and Rafail, 2009). Bruce Meyer and James Sullivan (2003) also find that those who are income poor are not necessarily the same as those who are consumption poor. Few researchers advocate for the replacement of income or poverty measures in favor of a material hardship measure, but many argue that material hardship measures are a useful complement to other economic well-being measures.

The measures of material hardship used in this study were first used in the United States by Susan Mayer and Christopher Jencks (1989) in a study of Chicago residents. Since then a number of surveys have included similar measures of material hardship, most notably the Survey of Income and Program Participation (SIPP) conducted by the U.S. Census Bureau. The Fragile Families study used measures from the SIPP that are very similar to those collected by Mayer and Jencks¹. In spite of 20 years of use of material hardship measures, there is little agreement on how to operationalize the measure (Beverly, 2001b; Ouellette, Burstein, Long, and Beecroft, 2004; Short, 2005; Heflin, 2006; Carle, Bauman, and Short, 2009; Heflin, Sandburg, and Rafail, 2009). Some researchers use an index of all material hardships, others look just at a specific hardship (i.e. phone disconnected) and some look at hardship domains such as housing or food hardship. In addition, the number of measures included in studies of hardships varies greatly (Rose, Parish, and Yoo, 2009). Despite these differences, most studies of material hardship cover the domains of health, food, ability to pay bills, and housing hardships. Studies of material hardship that use the Fragile Families data use both individual and aggregate measures (Teitler et al. 2002; Reichman et al, 2005; Schwartz-Soicher, Geller and Garfinkel, 2011; Nepomnyaschy and Garfinkel, 2011; Osborne, Berger and Magnuson, 2012). We include both a summary measure of material hardship and material hardship domains. Index or summary measures can estimate the degree of material hardship experienced by a family overall. Families may choose to allocate resources differently; therefore although one family may choose to forgo food another might forgo paying bills. An index measure captures an overall level of hardship regardless of family preferences (Beverly, 2001a). We also investigate the relationship with hardship domains (sets of questions related to a specific type of hardship) as research has found that models that look at domains of hardship are superior to fully disaggregated measures (Heflin, Sandburg, and Rafail, 2009) and as hardship domains provide information on whether particular types of hardships are more strongly related to the unemployment rate. We construct our domain measures to closely match prior studies that utilize the Fragile Families data (Heflin and Iceland, 2009).

We expect that as the unemployment rate increases the incidence of material hardships will increase and that some hardships will be more responsive to the unemployment rate than others. We might expect that some hardships are also more responsive to proximal changes in unemployment (say food hardship) whereas others respond more to longer term changes in the unemployment rate (say housing hardship). In the Fragile Families measures of hardship reflect any occurrence of the hardship over the prior 12 months, thus we construct the unemployment rates to match that time period.

Although no research has looked at the relationship between the unemployment rate and summary measures of material hardship, some research has looked at the relationship between unemployment and specific types of material hardship. Research has looked at the relationship between food insecurity and trends in the unemployment rate and has found that food insecurity increases with the unemployment rate (Nord, Andrews, Carlson, 2009). Studies generally find that housing affordability (such as ability to pay rent or mortgage) decreased, homelessness increased, and crowding increased during the Great Recession (Sell, Zlotnik, Noonan and Rubin, 2010; Sard, 2009; DeCrappeo, Pelleteire, Crowley and Teater, 2010; Painter, 2010). Although there are no studies of the relationship between the unemployment rate and medical hardship, some studies show child and adult health tends to improve or stay the same in recessionary periods (Ferreira and Schady, 2009; Ruhm, 2000, 2005; Chay and Greenstone, 2003; Dehejia and Lleras-Muney, 2004). However, Douglas Miller et al. (2009) suggest that gains in adult health are largely concentrated among the

¹A few additional questions from the Social Indicators Survey are also included.

elderly and may reflect increased time available from care givers. No literature relates the unemployment rate to having utilities cut off or bill hardships. We fill this gap by looking at the association between the unemployment rate and multiple measures of material hardship.

A related literature examines the relationship between individual employment or individual unemployment and material hardship (Elder, 1999; Conger and Elder, 1994; Lovell and Oh, 2006; Moffit and Cherlin, 2002; Danziger, Corcoran, Danziger, and Heflin, 2000; Edin and Lien, 1997; Teitler, Reichman, and Nepomnyaschy, 2004; Bauman, 2002). However, there are many reasons to expect such an association even in good economic times, as those who are unemployed may have other problems that cause both unemployment and material hardship. We focus instead on the unemployment rate, a measure that is not affected by the unobserved problems or choices of the individuals in our sample. In addition, the unemployment rate allows us to get at shocks that affect the whole household, not just the employment of one particular member. Households (and in particular low income households) often have multiple earners and a wide network of people who may help out in the event of an individual shock to employment or income. However, the whole network is likely to be affected by a shock as large as the Great Recession.

Unemployment and Government Transfers

For government transfers to mitigate the effect of increases in unemployment on material hardship, the transfers must increase as unemployment increases. We anticipate that entitlement programs (those that automatically expand as incomes fall), such as unemployment insurance and food stamps/SNAP will be associated with the unemployment rate, whereas TANF and public housing may be less responsive.

The literature on the association between the unemployment rate and government assistance programs suggests that many programs expand during recessionary periods but not all. These studies are mostly limited to documenting trends in participation and the unemployment rate and cannot account for other characteristics associated with both unemployment and program participation (excepting Ziliak, Gundersen and Figlio [2003] and Levy [2006]). This literature found that SNAP expanded dramatically during the Great Recession (Nord, Coleman-Jensen, Andrews and Carlson, 2010). Research also shows that SNAP caseloads are generally related to unemployment (Hanson and Gundersen, 2002; Ziliak, Gundersen, and Figlio, 2003). We expect that SNAP usage will be associated with the unemployment rate as it is an entitlement program. Another entitlement program that we expect will be related to the unemployment rate is unemployment insurance. The descriptive literature on UI also suggests that UI greatly expanded during the Great Recession as well as the length of time an individual may claim UI (Burtless, 2009). Temporary Assistance for Needy Families (TANF) is another cash transfer program that may help families avoid hardships, but although TANF caseloads rose in some states, they remained flat and decreased in others during the Great Recession (Pavetti and Rosenbaum, 2010). Since TANF, unlike AFDC before it, is no longer an entitlement, we are not sure that caseloads will expand in times of economic crisis.

Medicaid, another government program, may help families avoid medical hardship. The American Recovery and Reinvestment Act (ARRA, 2009) provided funding for Medicaid, and Medicaid enrollment increased during the Great Recession (Kaiser, 2010). In analyses that adjusted for demographic characteristics and focused on low skill workers, Helen Levy (2006) found that an increase in the unemployment rate was not associated with increased use of public health insurance. Despite these findings, we expect to see increased receipt of Medicaid as more families become eligible to receive Medicaid as the unemployment rate increases.

Lastly, public housing or section 8 vouchers may also help families avoid housing hardships. The ARRA also provided additional funding for emergency housing assistance and programs to help families avoid foreclosure (Sell et al. 2010). We did not find any studies documenting the association between housing assistance and the unemployment rate, but we expect that housing assistance will be the least responsive to changes in the unemployment rate as the subsidies for low income housing and stock of public housing, may be fixed in the short run.

Government Transfers and Material Hardship

We also expect government transfers to mitigate the experience of material hardship. But, as many prior studies of government transfer programs and food insecurity in particular have discussed, self-selection of participants into transfer programs is driven by need. If selection into programs is driven by need, analyses of the relationship between program participation and hardship are potentially plagued not just by selection, but more fundamentally by reverse causality; hardship leads to the use of government programs. Unfortunately, the reverse causality problem has been given insufficient attention in the literature.

The largest literature on government programs and hardship focuses on food insecurity and SNAP. Overall, this literature finds mixed evidence on the efficacy of the SNAP program. These mixed findings are in part due to the fact that households with higher levels of food insecurity are those that are most likely to utilize SNAP, leading to issues of both selection and reverse causality in these analyses. A number of studies focus on the selection issue and utilize nonparametric estimators (Gibson-Davis and Foster, 2006) or household fixed-effects (Wilde and Norde, 2005) but these studies continue to find perverse effects of SNAP on food insecurity. Although these estimation techniques may help account for selection, they cannot deal with reverse causality. Instrumental variables can account for both selection and reverse causality. A number of studies utilize state participation rates as the instrument and generally find no association between SNAP and food insecurity. State participation rates deal with selection on the individual level, but do not deal with reverse causality in that states with high levels of need and hardship will have high levels of program participation (e.g. Gunderson and Oliveira, 2001; Huffman and Jensen, 2003). Although a number of other studies have used other instruments, most fail to satisfy the exclusion restriction (are not exogenous) necessary for a good instrument (e.g. Yen, Andrews, Chen and Eastwood, 2008). The one study we found that utilized good instruments (the percent of accidental overpayments and underpayments in SNAP) finds that food stamp receipt is associated with a 22 percent reduction in food insecurity (Mykerezi and Mills, 2010).

We found no studies of the association between UI and material hardship, but UI has been shown to help families escape poverty and likely helps families avoid hardships (Gabe and Whittaker, 2011) and Gruber (1997) finds that UI helps families smooth food consumption over time. The literature on TANF and material hardships is only slightly more extensive. Studies have found an association between TANF sanctioning (reduction or termination of benefits) and increased hardship, in particular utility hardship, but these studies do not account for selection into sanctioning and hardship (Kalil, Seefeldt and Wang, 2002; Reichman, Teitler, and Curtis, 2005).

The literature on the effect of Medicaid on unmet medical needs is mixed and these studies are also complicated by selection and reverse causality issues as eligible individuals sign up for Medicaid when they have a medical need. Two studies find that enrollment in Medicaid reduces unmet medical needs (Newacheck, Pearl, Hughes and Halfon, 1998; Carlson, DeVoe and Wright, 2006) but these studies rely on cross sectional data and cannot fully account for selection or reverse causality. One study utilizes instrumental variables to investigate this question and finds no relationship between Medicaid and unmet medical

needs, however this may be a result of poor instruments (Long, Coughlin and King, 2005). Several studies report that expansions in Medicaid coverage of children are associated with improvements in utilization of well child visits, and decreases in unnecessary hospitalizations (Currie and Gruber, 1997; Dafny and Gruber, 2005; Aizer, 2007) suggesting a reduction in unmet medical needs.

The literature on public/section 8 housing and housing insecurity is small. Experimental research on public housing vouchers found that vouchers reduce housing insecurity by about 70 percent (Wood, Turnham and Mills, 2008). The Moving to Opportunity (MTO) demonstration included a comparison group that also followed rules of the Section 8 program and found no significant associations with housing insecurity (De Souza Briggs, Popkin and Goering, 2010). However, the MTO participants were all public housing residents when they received the voucher, whereas most of the participants in the Wood et al. (2008) study were not in public housing prior to participating in the experiment. Thus, the Wood et al. study tests the impact of Section 8 vouchers, whereas the MTO demonstration tests the effect of moving from public housing to a Section 8 voucher. Currie and Yelowitz (2000) used the gender composition of children in two child families as an instrument for residence in public housing and found that residence in public housing projects was associated with better housing conditions and better schooling attainment for children, other things being equal.

In short, while many studies find positive associations between program participation and hardship it is likely because they fail to control for reverse causation. The few studies with sound methodological approaches that address or avoid reverse causation find that program participation reduces a variety of hardships.

Data and Methods

Data

Studies of changes in poverty and the income distribution during recessionary periods find that the bottom of the income distribution and lower educated workers are most affected by recessions (Blank and Blinder, 1986; Blank and Shierholz, 2006; Blank, 2010). We use data from the Fragile Families and Child Well Being Study because it follows an economically disadvantaged population who are likely to be hit the hardest by an economic crisis.

The Fragile Families study is a sample of approximately 5,000 births in 20 large U.S. cities (in 15 states). Births were randomly sampled between 1998 and 2000 with an oversample of non-marital births. The study is representative of births in large cities (populations over 200,000). Mothers and fathers were interviewed at the time of the birth of the child and follow-up interviews were conducted when the child was 1 (1999–2000), 3 (2001–2003), 5 (2003–2006), and 9 years old (2007–2010). The panel data and timing of the most recent survey provide us with a great deal of variation in the unemployment rate over time making it ideal for our study. The 9-year follow up survey (5th wave) was collected from May 2007 through February 2010. Therefore we have data from just before the large crash in December 2007 beyond the official end of the Great Recession (June, 2009, NBER) as well as data from when the unemployment rate peaked in October 2009.

The survey is designed to cover questions of parental relationships, economic wellbeing, parenting, and child wellbeing. Ninety percent of the mothers who completed baseline interviews were re-interviewed when their children were approximately 1-year old. Eighty-eight percent of mothers who completed baseline interviews were re-interviewed when their children were about 3-years old, 87 percent were interviewed when their children was about 5-years old, and 76 percent were interviewed when their child was about 9-years old.

Analyses of the respondents who attrite from the sample show that they are more disadvantaged than the rest of the sample. Those who attrite are more likely to have less than a high school degree and have lower income to needs ratios than those who do not attrite. Attriters are also more likely to be Hispanic and be immigrants than those who do not attrite. We comment on how attrition affects our findings in the discussion section.

In this study we focus on the mothers' reports as they are more complete than the fathers' reports and mothers are more likely to be residing with children, a population who may be both more vulnerable to the effects of hardship and more eligible for support from public programs. We used multiple imputation to impute values for missing data on our covariates (we estimated all our analyses on the non-imputed data and the results were nearly identical). Multiple imputation utilizes the observed data to impute values for individuals who are missing data (Allison, 2002; Rubin, 1976). We imputed 5 data sets and the estimates are averaged over these data sets. All the survey waves are pooled and the resulting sample is 19,592 (person-year observations). Three thousand four hundred sixty six person-year cases are missing from a survey wave. Our final sample is 16,126 person-year observations and 4,357 respondents contribute to the estimates.

Material Hardship

We create measures of five hardships and a summary variable that includes 10 hardships. Additional detail on the survey questions are in Appendix 1. A dichotomous measure is created for each of the five domains representing whether or not an individual had experienced the hardship. All hardship questions ask the mother if she ever experienced the hardship in the last 12 months. The food hardship measure includes two questions: "In the past twelve months, did you receive free food or meals" and "Were you ever hungry, but didn't eat because you couldn't afford enough food?"² Inability to pay bills is measured using two questions: "Did you not pay the full amount of rent or mortgage payments" and "did you not pay the full amount of a gas, oil or electricity bill?" Housing insecurity is measured by three questions: "Did you move in with other people even for a little while because of financial problems?", "Did you stay in a shelter, in an abandoned building, an automobile or any other place not meant for regular housing, even for one night?" and "Were you evicted from your home or apartment for not paying the rent or mortgage?" The measure of medical hardship is based on the question "Was there anyone in your household who needed to see a doctor or go to the hospital but couldn't because of the cost?" The utilities cut off variable includes two questions: Whether or not "your gas or electric service was ever turned off, or the heating oil company did not deliver oil because there wasn't enough money to pay the bills", and "was your telephone service ever disconnected by the telephone company because there wasn't enough money to pay the bill?" Lastly, the summary or index measure is constructed by assigning mothers a 1 if she reports experiencing any of the hardships described above to create a dichotomous variable. We also investigated the use of a count measure that added the individual's hardships and our results were substantively unchanged.

Unemployment

We construct an average unemployment rate over the last year since the date of the mother's interview in order to match our key dependent variable which is a measure of hardship over the previous year³. Information about the monthly unemployment rate was appended to the

²In Year 3 the food hardship variable is based on just one question: "Did you receive free food or meals" as the second question was not asked.

³We investigated the relationship between the outcome variables and different lags in the unemployment rate but it did not substantively change our results.

data set using data from the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS). We append two different unemployment rates. First, using the mothers' current Core Based Statistical Area (CBSA – similar to a Metropolitan Statistical Area) and based on the date of the interview (for each interview wave), we attach the unemployment rate for the CBSA in which she lives at the time of the interview. Second, we append the unemployment rate from the mother's original CBSA (regardless of whether the mother moved) to the data for each wave of data based on the date of the interview. For example, if a mother was sampled in Boston, MA and she moves to Indianapolis, IN, in the first version of the unemployment rate (current city) the analyses are done using the unemployment rate faced in Boston until she moves to Indianapolis at which point the Indianapolis unemployment rate is used. In the second version of the unemployment rate (original/baseline city) the analyses are conducted using the Boston unemployment rates even after she has moved (but adjusted in time). We discuss reasons for doing both of these analyses in the methods section.

Our study focuses on the unemployment rate; however, as the latest recession illustrated, unemployment and employment do not always move together since people can also drop out of the labor force (discouraged workers, for which we do not have any data). Hence, we also looked at employment rates using data from two different sources: the LAUS and the Current Employment Survey (CES). LAUS data primarily comes from the Current Population Survey and CES data comes from Employment Statistics. For both data sets, rates were calculated using the number employed divided by population data (individuals aged 18–64) that was appended from Census data and then averaged over the last year. Using the employment rate (instead of the unemployment rate) did not substantively change our results. In addition, the results of the unemployment rate analyses conducted with the LAUS and the CES were very similar. Results from the employment analyses are not reported here but are available from the corresponding author upon request.

Government Transfer Variables

We investigate the association between several government transfer programs and the unemployment rate. Respondents are asked if they received SNAP, UI, and TANF in the last year. Respondents were also asked if they were currently covered by Medicaid and if the focal child was covered by Medicaid. In the year 9 survey mothers were not asked if they received Medicaid separately from other forms of health insurance. Therefore we assumed mothers received Medicaid in year 9 if they reported that their child received Medicaid. This measure may overestimate the use of Medicaid for mothers in that survey wave so these estimates should be interpreted with caution. We report mothers receipt and the focal child's receipt separately. Lastly, respondents were asked if they were currently living in a public housing project or receiving government aid to pay for housing. These questions are all coded as yes/no responses.

Other Variables

The main focus of our analyses are individual fixed effects models. These models control for any constant characteristic of the mother across waves. However, we also estimate pooled logistic models (without individual fixed effects) for comparison that include a number of basic demographic controls found to be important in other studies of material hardship. Previous research finds that marital status is significantly related to the experience of material hardship (Lerman, 2002). Other important predictors of hardship include race/ethnicity, education levels, and age (Mayer and Jencks, 1989; Ouellette et al, 2004; Mirowsky and Ross, 1999). We include a measure of mental health (major depressive episode – dysphoric mood or anhedonia) using the Composite International Diagnostic Interview-Short Form (Kessler et al. 1998) as it has been found to explain a lot of the

variation in hardship (Sullivan et al, 2008; Heflin and Iceland, 2009). We also include controls for immigrant status, income-to-needs ratio (using official U.S. poverty thresholds established by the Census Bureau, adjusted by family composition and year) and city of residence. Lastly, we include an indicator for the year of interview. All of our control variables are measured at the baseline survey except mental health which was collected at the 2nd wave of the survey (when the child was one) but asks about depression in the last year. Thus, the covariates predate the measures of the unemployment rate and material hardship (which vary over time).

Methods

We examine the relationship between material hardship and the unemployment rate using two logistic models, one logistic model where we have pooled all of the waves of data and include a city fixed effect and extensive controls, and a second logistic model where we include person-specific fixed effects. Our key independent and dependent variables are measured at the 1, 3, 5, and 9 year follow-up interviews. As mentioned above, our covariates are all measured at the baseline (birth) interview and predate our variables of interest. We include interview year as a time varying covariate. Specifically, our pooled city fixed effects logistic model is estimated by the following equation:

$$MH_{it} = \beta_0 + \beta_1 UR_{it} + \beta_2 X_{it-1} + \varepsilon_{it} \quad (1)$$

where MH_{it} denotes the i 'th respondent's material hardship score in the survey waves 1,3,5,9, UR_{it} denotes the unemployment rate over the past year for survey waves 1,3,5,9, X_{it-1} is a vector of covariates that includes demographic characteristics of the individual measured at baseline, and ε_{it} is the disturbance term. The β_1 is the main parameter of interest. In addition to the control variables discussed above, model (1) included controls for each city.

Our second logistic model includes person specific fixed effects and is estimated using the following equation:

$$MH_{it} = \beta_i + \beta_1 UR_{it} + \beta_2 X_{it} + \varepsilon_{it}. \quad (2)$$

Individual fixed effects models exploit the longitudinal nature of our data and allow us to control for fixed personal characteristics that might be correlated both with residing in an area with higher unemployment rates and with suffering from material hardship. For example, if a person is constrained to stay in a high unemployment area (perhaps because they lack the assets necessary to move) then their lack of assets may also increase the probability that they suffer from material hardship. In model (2), the only covariate included in X is interview year.

Each analysis is conducted using the original/baseline city unemployment rate as well as the current city unemployment rate. In preliminary analyses we found (not surprisingly) that those who lived in a city with a higher baseline unemployment rate at the time of the survey were more likely to have moved to a new city when they were followed up. Hence, the unemployment rate experienced by an individual in their current city is to some extent the result of an individual choice. Using the (current) unemployment rate in the baseline city solves this problem in models that also control for individual fixed effects. The fixed effect controls for the baseline city (a characteristic of the person that is fixed over the analysis). Analyses using the original/baseline city unemployment rate allow us to assess the association between the unemployment rate that individuals would have faced in the baseline city, and material hardship. However, we find very similar results whether we use

the unemployment rate in the baseline city or the current city, and in additional analyses (not reported) where we drop movers entirely.

For both models (1) and (2) we tested several functional forms (entering unemployment as a set of dummies, logged, and quadratic) and found that the substantive results were very similar between the different models. We estimate models (1) and (2) for each of the material hardship domains, the summary (index) hardship measure as well as the government assistance measures.

Results

Figure 1 shows the unemployment rate over the years in which the survey data was collected in each of the 20 cities in our sample. The gaps in the graph represent the periods when no interviewing took place. Figure 1 shows a general upward trend in the unemployment rate in all cities in the early 2000's that appears to remain relatively flat through the mid 2000's with a decreasing trend in 2004 to 2006. In the latest data collection (2007 to 2010) there is a dramatic upward trend in the unemployment rate over time in all cities, corresponding to the Great Recession. This graph demonstrates the large variation in the unemployment rate during data collection which makes these data particularly suitable to investigating the effects of the unemployment rate on the well-being of families.

Table 1 provides descriptive information on material hardship, government safety net programs, and the demographic characteristics of our sample by different rates of unemployment. The sample is weighted using the city sampling weights to account for the oversample in non-marital births. About 1/3 of the sample is black, 1/3 white and 1/4 Hispanic. Thirty two percent of the sample has a high school degree and about 20 percent have a college degree or higher. A little over one quarter are immigrants and about 50 percent are married.

Mean levels of material hardship are high and generally increase with the unemployment rate. When mothers live in areas that experience less than 4 percent unemployment about 41 percent had at least one hardship. In comparison, when the unemployment rate is 9 percent or greater, about 51 percent of the sample experiences one or more material hardships. Frequency of experiencing food hardship, bill hardship, and having your utilities cut off generally increase with the unemployment rate (although the increase is not entirely linear). The increase is most marked for bill hardships and having utilities cut off. When the unemployment rate is less than 4 percent about 24 percent of the sample experiences a bill hardship and 15 percent have had their utilities cut off. At unemployment rates of 9 percent or higher, bill hardships are reported by 38 percent of the sample and utility hardships by 21 percent.

We expect that government assistance programs would increase in usage as the unemployment rate increases and for SNAP, UI, and Medicaid this is the case. The exception is TANF receipt which appears to be decreasing in receipt as the unemployment rate increases. Respondents in areas with higher unemployment rates also receive less public housing.

Results from the pooled logistic models (1) and individual fixed effects models (2) of the effect of current city unemployment rate and original/baseline city unemployment rate on the summary material hardship measure are reported in Table 2. Turning to the current city results (columns 1 and 2), a 1 percentage point increase in the unemployment rate is associated with a 10 percent increase in the likelihood of experiencing a material hardship in the pooled logistic model and a 12 percent increase in the individual fixed effects model. The results for the original/baseline models (columns 3 and 4) are similar. A one percentage

point increase in unemployment is associated with a 12 percent increase in likelihood of experiencing a hardship in the pooled logistic model and a 16 percent increase in the individual fixed effects model. In times of economic crises where unemployment rates may move from 5 to 10 percent the likelihood of experiencing a material hardship increases by nearly 50 percent.

A few covariates are significantly associated with material hardships in the pooled logistic models. Mothers with lower levels of education are more likely to experience hardship whereas those with a college degree or higher are less likely. Being an immigrant is associated with a lower likelihood of experiencing hardship. Respondents who are single or cohabiting are significantly more likely to report experiencing material hardships than those who are married. An increase in the income-to-needs ratio measured at baseline is significantly associated with a decrease in the summary hardship measure. Depression is also significantly associated with higher levels of hardship.

The individual fixed effects model is a more conservative test of the association between the unemployment rate and hardship because it controls for all fixed characteristics of the respondent, measured and unmeasured. In general, we find that the size of the coefficient on the unemployment rate is very similar between the pooled logistic and the individual fixed effects models (depending on the model, likelihoods that differ between 1–3 percent). We focus our discussion on the individual fixed effects results moving forward. We also concentrate on the analyses using the original/baseline city unemployment rate for the remaining analyses as it is a better test of the relationship between an exogenous change in the unemployment rate experienced by the individual and material hardship.

Table 3 reports the results of the individual fixed effects regression of the unemployment rate in the original/baseline city on hardship domains. As predicted, some hardship domains are more strongly associated with the unemployment rate than others. Inability to pay bills and having utilities cut off are the only two individual hardship domains that are significantly related to the unemployment rate in these models. A one percentage point increase in the unemployment rate is associated with a 13 percent increase in the likelihood of experiencing a bill hardship and a 16 percent increase in the probability of having your utilities cut off. Food hardship, housing hardship, and medical hardships are not significantly associated with the unemployment rate.

Table 4 shows the results of the individual fixed effects regressions on government transfer programs. We find that SNAP, UI, TANF and Medicaid are all associated with the unemployment rate. As expected both entitlement programs (SNAP and UI) are significantly associated with the unemployment rate. A one percentage point increase in the unemployment rate is associated with a 19 percent increase in the likelihood of receiving SNAP and a 13 percent increase in the likelihood of receiving UI. Both TANF and Medicaid are also significantly associated with the unemployment rate. The likelihood of receiving TANF increases by 16 percent when the unemployment rate increases by one percentage point. Similarly, a one percentage point increase in the unemployment rate is associated with a roughly 10 percent increase in the likelihood of receiving Medicaid for both mothers and the focal child in the study. The receipt of public housing is not associated with the unemployment rate.

Unfortunately, the Fragile Families data are not well suited to directly estimating the mitigating effect of transfers on hardship. Questions about both program participation and material hardship refer to the previous year and time ordering within years is not possible. Still, our estimates of the effects of unemployment on hardship and program participation—especially when used in conjunction with previous literature on the mitigating effects of

transfer programs on hardship—can be used to obtain crude estimates of the hardship mitigating effects of transfer programs during the Great Recession.

To estimate the mitigating effects of transfer programs during the Great Recession, we conducted counterfactual estimations. The counterfactual estimates assume that families that participated in safety net programs and did not experience hardship would have experienced hardship if they had not had access to these programs. For example, if an individual reported receiving SNAP but did not report experiencing a food hardship, in the simulation we assigned them a food hardship. These counterfactual estimations can be seen as an upper bound estimate of the ability of government programs to aid families in avoiding hardship. Although we conducted multiple analyses, here we limit the discussion to SNAP and food hardship. We also simplify the Great Recession as a description of the increase in the unemployment rate from 5 to 10 percent.

Our analyses of the association between the unemployment rate and food hardship suggest that food hardship increased about 2.6 percentage points during the Great Recession, though the standard error associated with this estimate is large enough so that the coefficient is not statistically significant at the 5% level. (Note that these calculations use the coefficients from the results of the linear probability models which are substantively the same as our logistic models but are simpler to use in these calculations.) The unemployment rate coefficient on the counterfactual estimate, however, is much larger and statistically significant. The counterfactual analysis implies that in the absence of SNAP, food hardship would have increased by about 8.4 percentage points during the Great Recession.

We also estimate how SNAP mitigated the effects of the Great Recession on food hardship by combining our estimates of the effects of unemployment on participation in SNAP with reliable estimates of the effects of SNAP participation on food hardship from another study. We find that a one percentage point increase in the unemployment rate is associated with 2 percentage point increase in the use of SNAP. Thus, an increase in unemployment from 5 to 10 percent increases SNAP by 10.5 percentage points. Recall that Mykerezi and Mills (2010) find that participation in SNAP reduces food insecurity by 22 percent. Together these findings, which we consider to be our best estimates, suggest that in the absence of SNAP, food hardship would have been about 2.3 percentage points higher during the Great Recession. Note that this estimate is nearly as large as the estimated observed increase of 2.6 percentage points. In other words, in the absence of SNAP, food hardship would have been nearly twice as high as what we observe. Finally, it is interesting to note that adding the predicted 2.3 percentage point increase to the observed 2.6 percentage point increase yields an estimate that is nearly 60% of our upper bound estimate.

Summary and Conclusion

This paper looks at the association between the unemployment rate and material hardships as well as public transfers. Focusing on the unemployment rate allows us to exploit an economic shock to families and neighborhoods. To our knowledge, ours is the first analysis to have focused on the relationship between the unemployment rate and multiple measures of material hardship. Another important contribution of this study is that we examine the relationship in a panel data context, so that many unobservable characteristics of households that might be correlated with the propensity to experience hardship are controlled. Lastly, the last wave of our data was collected during the Great Recession providing us with large variation in the unemployment rate. These data also focus on mostly low-income families, households we might expect to be most likely to experience material hardship in a recession.

Our results show that material hardship increases with the unemployment rate and that in recessionary periods the likelihood of experiencing a hardship increases dramatically.

Moreover, the results are generally very similar in pooled logistic models and individual fixed effects models, and are robust to various ways of treating people who move suggesting that they are not driven by unobserved characteristics of families or migration. We find that the summary measure of hardship is related to the unemployment rate; when we look at individual hardships, only utilities and bills are associated with the unemployment rate though this may be because safety net programs buffer the effects of higher unemployment rates on other types of hardship. Food, housing, and medical hardships are not significantly associated with the unemployment rate. Far fewer individuals report experiencing these hardships in comparison with bill and utility hardships and so the insignificant association may in part be due to insufficient power to detect the association. We note that many studies of food insecurity utilize a more comprehensive scale (18-item USDA food insecurity measure) not available in our data. Although our measure is similar to other studies of material hardship, the more comprehensive measure of food insecurity might yield different results.

Although this study does not directly test the extent to which government transfer programs alleviate the effect of the unemployment rate on material hardship, we investigate the association between the unemployment rate and public transfers. If public transfers are not responsive to changes in the unemployment rate they cannot possibly mitigate the experience of hardship in times of economic crisis. As expected, we find that entitlement programs (SNAP and UI) are positively associated with an increase in the unemployment rate. We also find that TANF and Medicaid are positively related to the unemployment rate, suggesting that not only are entitlement programs responsive to economic crisis, but so are other public transfer programs. Our finding that TANF receipt is associated with the unemployment rate is contrary to our descriptive results. This suggests that research that looks only at descriptive or trend data may not demonstrate the true relationship between changes in the economy and public assistance. Housing assistance is not related to the unemployment rate; this program may not have the ability to be as responsive to sharp changes in the macro-economy as other government programs.

Our study has some limitations. First, our sample is not generalizable to the population as Fragile Families is representative of mothers who gave birth in large cities in the US. However, many of the mothers in the sample are low income, and are likely to be particularly vulnerable to hard times. They are also a group for whom policies and government assistance may be most relevant. Second, fixed effects models, although they control for time invariant unobservable characteristics, cannot account for unobserved time varying individual characteristics that may be associated with both the unemployment rate and material hardship. However, the small differences between the pooled logistic and the individual fixed effects estimates provide some reassurance that such unobservables are unlikely to be driving the relationship between the unemployment rate and material hardship.

This paper uses the unemployment rate and cannot account for discouraged workers who have left the workforce as a result of sustained unemployment. Therefore we may underestimate the effect of the recession (as measured by unemployment) on material hardship; however we did find similar associations when we used the employment rate (number of employed individuals divided by the population of individuals aged 18–64) the in supplemental analyses.

Lastly, the panel structure of the data means that some individuals attrite from the survey entirely or are missing at some survey waves. As mentioned earlier, individuals who attrite are more disadvantaged economically. It is likely that the missing individuals are the most vulnerable to hardship and in particular the most likely to be homeless. Thus, our study may

underestimate the relationship between the unemployment rate and homelessness in particular but also other hardships.

Our findings are suggestive for public policy and future research. Our models suggest that in times of economic crisis families are more likely to experience material hardships generally, but in particular inability to pay bills and having their utilities cut off. While programs like SNAP, UI, TANF and Medicaid are likely providing a financial bridge for low income families, these programs do not directly target the hardships families are most likely to experience. Few government programs directly provide assistance with utility payments (phone, gas, or electric) or general bill payments. Hence, in times of economic crisis families may be more likely to experience these hardships than other hardships. Programs currently available in some locations allow low income families to lower their gas or electric rates, and may help families avoid having their utilities disconnected. Future research should investigate whether these programs help families avoid utility hardships.

Research that further investigates the role of public safety net programs in avoiding material hardship would provide valuable information to policymakers. Programs like unemployment insurance allow families to allocate resources as needed (to purchase food or pay rent), whereas programs like SNAP may alleviate food costs allowing families to put money towards other costs and avoid hardship. As Federal, state, and local governments face the need to make budget cuts, reducing funding to programs like SNAP, UI, or TANF could have real effects on the material hardships families will face in a recession. The results of our counterfactual analyses and from prior literature suggest that SNAP helps to mitigate the association between the unemployment rate and food hardship. However, more research that carefully accounts for both selection and reverse causality and that looks at all types of government assistance and different hardships is needed.

Future research should also investigate the effect that hardship has on families and children. Some research suggests that material hardships have effects on child aggressive behaviors (Zilanawala and Pilkauskas, 2012). Material hardships may affect many aspects of the family unit. Given the growing literature linking childhood circumstances to adult outcomes, mitigating the effects of hardship on children should be a particular priority for public policy (c.f. Currie, 2010).

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Appendix 1: Construction of Material Hardship Measures

“We are also interested in some of the problems that families face making ends meet. In the past 12 months, did you do any of the following because there wasn't enough money?”

NOTE: REPEAT AS NEEDED 3“because there wasn't enough money”

Food Hardship

(In the past twelve months,) did you receive free food or meals?

(In the past twelve months,) were you ever hungry, but didn't eat because you couldn't afford enough food?

Bill Hardship

(In the past twelve months,) Did you not pay the full amount of rent or mortgage payments?

(In the past twelve months,) Did you not pay the full amount of a gas, oil, or electricity bill?

Housing Insecurity

(In the past twelve months,) Were you evicted from your home or apartment for not paying the rent or mortgage?

(In the past twelve months,) Did you move in with other people even for a little while because of financial problems?

(In the past twelve months,) Did you stay at a shelter, in an abandoned building, an automobile or any other place not meant for regular housing, even for one night?

Utilities

(In the past twelve months,) Was your gas or electric service ever turned off, or the heating oil company did not deliver oil, because there wasn't enough money to pay the bills?

(In the past twelve months,) was your telephone service ever disconnected by the telephone company because there wasn't enough money to pay the bill?

Medical

(In the past twelve months,) Was there anyone in your household who needed to see a doctor or go to the hospital but couldn't go because of the cost?

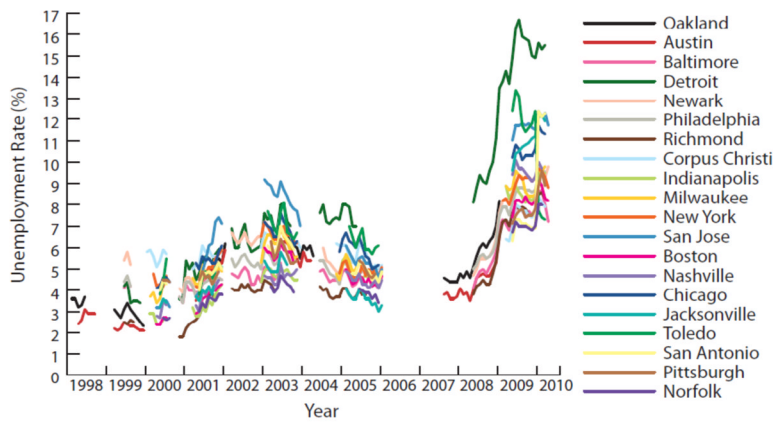


Figure 1.
Unemployment Rate during Interviewing

Table 1

Sample Descriptives (means and frequencies) by the Unemployment Rate (N=16,146)

Unemployment Rate	< 4% (n=4,418)	4-4.9% (n=3,976)	5-5.9 % (n=3,375)	6-6.9% (n=2,829)	7-8.9 (n=1,320)	9+ (n=208)
Material Hardships						
Summary Hardship	40.67	41.23	40.3	40.18	44.1	50.8
Food Hardship	8.18	9.26	9.43	10.78	11.78	10.33
Bill Hardship	24.15	22.73	22.58	21.61	26.97	37.5
Housing Insecurity	9.28	8.35	8.28	8.7	6.54	7.36
Medical Problems	4.81	4.79	4.67	4.06	5.28	5.9
Utilities Cut Off	14.52	17.25	14.32	14.92	20.36	21.45
Government Safety Nets						
TANF	15.39	14.68	14.45	11.69	12.64	8.3
SNAP	27.32	30.09	30.49	31.67	37.07	33.16
UI	3.98	4.47	5.29	5.28	8.85	6.86
Housing	13.55	13.29	11.54	13.86	10.21	9.34
Medicaid Mom	43.46	52.2	52.53	56.28	55.69	55.71
Medicaid Kid	42.58	50.85	51.49	55.86	55.27	55.74
Covariates						
Age	26.60	27.04	27.24	27.05	26.81	27.23
<i>SD</i>	6.23	6.25	6.29	6.23	5.91	6.63
White	36.05	32.06	31.67	23.99	22.56	23.65
Black	37.42	38.84	28.72	33.75	41.87	35.93
Hispanic	20.32	23.69	32.90	34.86	27.46	26.39
Other	6.21	5.41	6.71	7.40	8.11	14.03
Less than High School	28.82	26.58	24.12	29.82	29.28	33.90
HS graduate/GED	30.51	33.45	35.14	31.57	28.97	26.39
Some college	19.16	18.88	21.12	18.69	23.08	18.19
College and above	21.51	21.09	19.62	19.92	18.67	21.52
Immigrant	17.52	21.97	24.39	31.01	25.59	32.78
Married	53.67	50.38	54.52	50.76	48.79	49.01
Cohabiting	21.82	23.65	23.29	22.78	23.62	24.88
Single	24.51	25.97	22.19	26.46	27.59	26.11

Unemployment Rate	< 4% (n=4,418)	4–4.9% (n=3,976)	5–5.9 % (n=3,375)	6–6.9% (n=2,829)	7–8.9 (n=1,320)	9+ (n=208)
Poverty Ratio (0–12)	3.15	3.22	3.08	3.11	3.15	2.54
<i>SD</i>	3.14	3.31	3.13	3.4	3.23	2.55
Depression	12.14	10.10	10.77	8.96	12.21	8.56

Note: Data are weighted and in person-years by city sampling weights, n's are unweighted. TANF= Temporary Assistance for Needy Families, SNAP= Supplemental Nutrition Assistance Program, UI=unemployment insurance. All covariates are measured at the baseline survey with the exception of depression which is measured at year 1.

Table 2

Summary Hardship: Unemployment Rate in Current and Baseline City

Summary Hardship Indexes (Odds Ratios)	Current City		Baseline/Original City	
	(1)	(2)	(1)	(2)
Unemployment Rate	1.100 ^{***} (0.022)	1.121 ^{***} (0.031)	1.119 ^{***} (0.035)	1.155 ^{***} (0.037)
Mom's Age	1.000 (0.004)		1.000 (0.004)	
Black	1.171 [*] (0.099)		1.161 [*] (0.098)	
Hispanic	0.875 (0.080)		0.874 (0.079)	
Other	1.115 (0.128)		1.106 (0.126)	
Less than HS	1.143 ^{**} (0.067)		1.140 ^{**} (0.067)	
Some College	1.195 ^{***} (0.065)		1.193 ^{***} (0.065)	
College +	0.584 ^{***} (0.086)		0.579 ^{***} (0.085)	
Immigrant	0.705 ^{***} (0.084)		0.705 ^{***} (0.084)	
Cohabiting	1.686 ^{***} (0.106)		1.683 ^{***} (0.107)	
Single	1.465 ^{***} (0.093)		1.464 ^{***} (0.093)	
Income-to-Needs Ratio	0.867 ^{***} (0.011)		0.867 ^{***} (0.011)	
Depression	2.470 ^{***} (0.195)		2.468 ^{***} (0.195)	
Constant	0.438 ^{***} (0.065)		0.426 ^{***} (0.069)	
Observations	16,126	8,558	16,126	8,558

Note:

Model 1: Pooled logistic model.

Model 2: Individual fixed effects logistic model.

Robust standard errors in parentheses clustered at the city level in model 1. Logistic models also include city dummies and all models include year dummies not shown here.

p<0.01,

**
p<0.05,

*
p<0.1

Table 3

Hardship Domains: Unemployment Rate in Baseline City, Individual Fixed Effects

(Odds Ratios)	Food Hardship	Bill Hardship	Housing Hardship	Medical Hardship	Utilities Cut Off
Unemployment Rate	1.052 (0.046)	1.128*** (0.037)	1.067 (0.045)	0.989 (0.053)	1.161*** (0.042)
Observations	4,275	7,956	4,380	2,596	6,814

Note: Standard Errors in parenthesis. Models include year dummies not shown here.

*** p<0.01,

** p<0.05,

* p<0.1

Table 4
 Government Transfers: Unemployment Rate in Baseline City, Individual Fixed Effects

(Odds Ratios)	SNAP	UI	TANF	Medicaid (mom)	Medicaid (kids)	Public Housing
Unemployment Rate	1.187*** (0.044)	1.126** (0.060)	1.164*** (0.051)	1.103*** (0.039)	1.098*** (0.038)	1.043 (0.043)
Observations	6,651	3,035	5,435	6,717	6,940	5,484

Note: Standard Errors in parenthesis. Models include year dummies not shown here.

*** p<0.01,

** p<0.05,

* p<0.1