

The Effects of Job Displacement on Family Expenditures

Kyong Hyun Koo *

Michigan State University

JOB MARKET PAPER

November, 2016

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Abstract

Although a persistent decrease in earnings attributable to job displacement has been extensively documented in the literature, the persistent effects of job displacement on consumption have been relatively unexplored, due to the lack of appropriate data. Using the Panel Study of Income Dynamics during 1999-2013, I consider the effects of job displacement on consumption by estimating the effects of a husband's job displacement on his family expenditures. Even with a lasting and sizable fall in family income induced by a husband's job displacement, the households reduced their expenditures only moderately. More specifically, their expenditures fell just slightly in the periods around job displacement occurrences, then continued to further decline two to six or more years after the job loss, but not as much as their concurrent income loss. These later declines in their expenditures were largely driven by the fall in those for housing, health care and education. The relatively small reduction in those expenditures was achieved through a reduction in wealth.

JEL Classifications: J17, J63, J65, I30.

Keywords: Job Displacement, Expenditures, Consumption, Wealth, Savings.

* The author's affiliation is Michigan State University, East Lansing, Michigan, Email: kookyong@msu.edu. The author is deeply grateful to Steven Haider, Christian Ahlin, and Ben Zou for their thoughtful guidance and suggestions. Thanks also to Gary Solon and seminar participants at Michigan State University.

I. Introduction

The existing literature has extensively documented the persistent effects of job displacement on a worker's subsequent earnings. Although the estimates vary depending on the data set and period, displaced workers have been found to have 10 to 30 percent less earnings than those they would have without displacement, even six or more years after displacement (Couch and Placzek 2010; Jacobson, Lalonde, and Sullivan 1993; Ruhm 1991; Stevens 1997; Topel 1990; von Wachter, Song, and Manchester 2007).

To better understand the welfare and policy implications of job displacements, further investigation of how job displacement changes people's consumption behavior as well as their income path is needed, given that the former is a better indicator of people's well-being than the latter. In general, displaced workers' consumption behavior cannot be inferred solely on the basis of income change, because a change in income does not necessarily lead to the same or proportionate change in consumption. As predicted by life-cycle models of consumption and the permanent income hypothesis, displaced workers who are forward-looking should smooth their consumption by saving and/or borrowing. In practice, the ability of displaced workers to smooth consumption may depend on the adequacy of their savings or borrowing ability and the availability of any other insurance mechanisms to offset income loss, such as public/private transfers and labor supply adjustments of other family members (Blundell, Pistaferri, and Preston 2008; Richard Blundell, Pistaferri, and Saporta-Eksten 2016; Dynarski and Gruber 1997).

In contrast to the substantial literature on the income effects of job displacement, there is relatively scant literature examining the link between job displacement and consumption by using micro expenditure data. The majority of studies focus on only short-term change in workers' expenditures one or two years after displacement, or, if they do track the long-term

expenditure response of displaced workers, rely only on a limited number of expenditure categories, such as food and some other non-durables (Browning and Crossley 2008; Dynarski et al. 1997; Gruber 1997; Saporta-Eksten 2014; Stephens 2001).¹ Hence, there is a need to explore how displaced workers change their consumption behaviors, particularly over a long period during which they experience persistent income loss.

To fill this research gap, the current paper studies how a husband's job displacement affects a broad set of his family expenditures over an extensive period of time, from roughly two years before the displacement through six or more years after it, by using the 1999-2013 Panel Study of Income Dynamics (PSID). Furthermore, this study tracks concurrent changes in diverse components in family wealth and income of a displaced husband that underlie his family's expenditure behaviors, in order to explicitly capture the contribution of savings/assets as well as various family income sources that offset his earnings loss due to job displacement. This comprehensive analysis on the long-term effects of job displacement is possible mainly because of the availability of rich information on an extensive range of indicators of family expenditures and wealth, which have been biennially collected since 1999 by the PSID in addition to its continuous collection of detailed data on varied family income sources.

Like a number of previous studies, this study directly analyzes expenditures rather than consumption, although consumption is the concept more clearly linked to individual well-being. While there is little difference between the two for non-durable goods, a large difference can, of course, exist for durable goods; more simply put, a one-time expenditure on a durable such as a car could provide substantial consumption flows for multiple years. Even with the general distinction of expenditures from consumption, I choose to use expenditures for three reasons. First, income, expenditures, and changes in savings/assets are linked through an accounting

¹ A more detailed review of the literature is presented in Section II.

identity, and I make use of this identity to provide additional insight into how a family with a displaced husband (hereafter referred to as a displaced family) respond to his job loss. Second, accurately converting expenditures into consumption requires much additional data and assumptions, which can muddle the changes in the data. Third, changes in expenditures can still provide important insights into how consumption is changing.

The key findings of this paper can be summarized as follows. First, during the period 1998-2012, the annual total income of displaced families is reduced by 16 percent, on average, over the long period of time noted above (roughly two years before to six or more years after displacement) compared to what they would have without a husband's displacement. This large persistent income loss was mainly because the husband went through a substantial loss in annual earnings due to job displacement over the same period of time, and there was no significant role of other insurance mechanisms such as spouses' labor earnings and public/private transfers in compensating the earnings loss of displaced husbands.

Second, even with a large income loss, displaced families practiced considerable expenditure smoothing for a broad set of major expenditure categories related to food, housing, transportation, health care, and education (hereafter referred to as total expenditures). In particular, they did not decrease the expenditures significantly until the year of displacement, notwithstanding the roughly 12% of their annual income loss that they concurrently had by then. Roughly two years after displacement, their expenditures began to fall significantly by five percent, and decreased further point-estimate wise for the subsequent years, so that they had nine percent lower expenditures roughly six or more years after displacement, compared to what they would spend without displacement. This sluggish fall in the total expenditures of displaced families is not apparent in their food expenditures alone, which have been heavily relied on by a number of

previous studies to represent a family's whole consumption behavior. This study, in fact, like that of Stephens (2001), finds that their food expenditures began to fall even before the occurrence of a husband's displacement and also manifested a similar magnitude of decrease as the initial one even six or more years after displacement. Unlike the food expenditures, however, the other non-food expenditures of displaced families appeared not to have this early decrease in the year of, or prior to displacement found in food expenditures; their expenditures for housing, health care and education, in particular, began to fall quite slowly, which mainly drove the entire sluggish fall in their total expenditures. The decline in their food expenditure turns out to have explained only 15% of the lagged decrease in their total expenditures that began roughly two years after displacement.

Lastly, I find that the main tool of the large expenditure smoothing of displaced families was to decrease their own wealth relative to what they would have without the displacement. They began to decrease their total wealth, even before the occurrence of displacement, and ended up with \$172,000 less family wealth, on average, by roughly six or more years after displacement, than what they would have without it. This amount of wealth reduction equals 45% of the sample average of total family wealth in this study, and also covers roughly 55% of their disposable income loss during the same time. Furthermore, the speed of the decline in their family wealth was decreasing over time, which is consistent with their sluggish decrease in their total expenditures described above: A large decrease in their wealth occurred in the initial periods around the occurrence of job displacement to the extent that it roughly offset the total loss in their disposable family income during that same initial period. In turn, the annual decrease in their wealth for subsequent periods became less prominent covering only 40% of their annual disposable income loss that they had since roughly two years after displacement.

The remainder of the paper is structured as follows: Section II reviews relevant previous studies and highlights the contributions of this study to the existing literature; then, main econometric approaches and data set are described in Sections III and IV respectively; Section V presents empirical results, and Section VI summarizes the main findings of the paper and discusses respective implications. The conclusion is presented in Section VII

II. Literature Review

As noted earlier, there are a relatively small number of studies exploring the relationship between job displacement and consumption behaviors in contrast to the extensive literature investigating the adverse effect of displacement on workers' wages or earnings.² In particular, many of the studies exploring the consumption effect of joblessness have focused on analyzing the short term dynamics of expenditures. Dynarski and Gruber (1997) examine the immediate family expenditure response to the year-to-year change in earnings due to a head's unemployment shock, and find evidence of considerable expenditure smoothing. Gruber (1997) documents a significant role of unemployment insurance benefit in unemployed workers' expenditure smoothing. According to his estimates, the unemployment shock to a head resulted in 6% less family food expenditures within a year, on average, compared to the previous expenditure level before the shock. Browning and Crossley (2008) find that permanently laid-off workers reduced their total expenditures by 4 to 10% within 4 to 9 months after displacement, which represented a loss of two-year normal expenditure growth of temporarily laid-off workers, who were considered a control group fully insured against displacement shocks by the authors.

² See Couch and Placzek (2010) and Kletzer (1998) for summaries of papers related to the income effects of displacement.

Stephens (2001) and Saporta-Eksten (2014) explore the long-term relationship between job displacement and nondurable expenditures. Both authors find that the households with displaced heads practiced sizable expenditure smoothing through the whole post-displacement period. However, they do not further explore the link between the expenditure smoothing and dissaving /borrowing behaviors explicitly among household with displaced heads, as I do in the current study.

Specifically, Stephens (2001) considers the long-run dynamics of family consumption resulting from a husband's earliest displacement. Unlike the current study using a broad set of expenditure data, he relies solely on food expenditure data, which was the only nondurable expenditure data available in the PSID for 1968-1992, and find a much more moderate and less volatile decrease in food expenditures of displaced husbands' families that continued for more than 6 years after displacement compared to the severe decrease in family income they experienced during the same period.

Using more extensive family nondurable expenditure data in the PSID 1999-2009, Saporta-Eksten (2014) also explores the long-term dynamics of nondurable expenditures before and after job displacement. He finds there was an overall larger decrease in nondurable expenditures before and after displacement than that in food expenditures found by Stephens (2001). But in terms of changing patterns in nondurable expenditures around displacement occurrence, his findings, are similar to those of Stephens (2001) using food expenditures alone.

Saporta-Eksten's (2014) study differs from the current study in several respects. He uses a smaller set of expenditure data excluding durable expenditures and a shorter sample period for the analysis.³ Furthermore, the author uses only pooled OLS for the analysis without isolating

³ The author uses the expenditure data only for nondurables, thereby excluding from the analysis other expenditure data for major durables related to housing and vehicles.

the earliest displacement from other subsequent ones for each household's head. This is an important departure from the current study and that of Stephens' (2001) ; in contrast to Saporta-Eksten's (2014) study, both Stephens (2001) and I focus on the first-observed displacement of a husband and its long-term effects, and mainly use the fixed effect estimation to control unobserved time-invariant component for each household, which has been considered important for mitigating endogeneity issues in the literature (Jacobson, Lalonde, and Sullivan 1993; Stephens 2001; Stevens 1997). For that reason, Stephens' (2001) findings are more comparable to those from this study than the findings from Saporta-Eksten (2014).

The current study is also related to another strand of literature that empirically tests life-cycle theories and the permanent income hypothesis. A number of studies have used micro data to focus on exploring agents' consumption responses against well expected changes in income, and the empirical results diverge (Browning and Collado 2001; Hsieh 2003; Parker 1999; Souleles 1999). Browning and Crossley (2001) argue that such divergent results may largely stem from the differences in magnitudes of the expected income change across those studies; the greater the expected income change relative to life income, the greater its effect on people's current consumption. Accordingly, empirical studies using larger expected income variations would report more favorable results to the predictions of the standard life-cycle theories and the permanent income hypothesis.

In a more comprehensive approach related to testing life-cycle theories and the permanent income hypothesis, Blundell, Pistaferri, and Preston (2008) identified transitory and permanent income shocks from households' earnings variations by assuming a general earnings equation. They showed that permanent income shocks were much less insured than transitory ones, thereby leading to a larger change in family expenditures.

Along this line of literature, what people expect the future effects of a permanent income shock will be and how such expectation affect their consumption behaviors over a long period are interesting empirical research question, though relatively unexplored. Given that job displacement is a well-documented source of permanent income shocks, the current study provides useful information for examining those questions, through documenting long-term changes in expenditure/saving behaviors of displaced families using rich data on family expenditures and wealth.

III. Econometric Approach

I use a simple reduced-form approach, which has been extensively used by other relevant studies exploring the long-run effects of job displacement (Stephens 2001; Stevens 1997). The main model specification is,

$$Y_{it} = D_{it}\beta + X_{it}\gamma + \alpha_i + \delta_t + \epsilon_{it},$$

where Y_{it} is an economic outcome for family i in year t , such as total annual family income and its sub-components, total annual family expenditures and its subcomponents, and total family wealth and its sub-components.

I use both log and level specifications for the dependent variables in the analysis. On the one hand, using log dependent variables enables me to interpret the regression coefficients in terms of percentage points, which makes it easier to assess the relative impacts of job displacement and is also preferred in the literature on theoretical grounds for analysis regarding income and expenditure dependent variables (Deaton and Muellbauer 1980; Mincer 1974; Zeldes 1989). On the other hand, using level dependent variables is useful when analyzing dependent variables that are additively related, as are many of the dependent variables in my analysis. For example, I can

analyze how each disaggregated sub-component contributes to the total job displacement effects on an aggregate dependent variable in dollar terms because the linear regression coefficient for the aggregate level dependent variable is merely the sum of the corresponding regression coefficients for all the aggregate variable's exclusive and exhaustive sub-components. Similarly, I can examine how job displacement affects the family budget constraint because a family's change in wealth equals the difference between income and expenditures. A further advantage of using level dependent variables is that I can include zero or negative values of the dependent variables in the regressions, which is not possible when using log dependent variables.

The vector D_{it} refers to the dummies indicating the first job displacement that occurred to the husband of a household i in the past, currently, or in the future at year t . Therefore, the coefficients for the job displacement dummies basically capture the mean log or level differences in family incomes, expenditures, or wealth of displaced heads' families from those they would have without experiencing their heads' displacement. X_{it} is a vector of time-varying variables, which is expected to capture dynamic changes in family expenditure preference; X_{it} includes logarithmic family food standard variable⁴, quadratics of the head's age,⁵ the number of family members between the ages of 0 and 5, 6 and 12, 13 and 17, 18 and 64, and 65 or older. α_i stands for family-specific time-invariant components affecting family behavior. A large body of literature has underscored the importance of controlling the unobserved effect because it is likely to be correlated with the probability of job displacement (Couch and Placzek 2010; Jacobson, Lalonde, and Sullivan 1993; Stevens 1997). To control the unobserved effect, I employ the fixed effect estimation method. δ_t is a vector of year dummies controlling the aggregate time effect,

⁴ These are variables which were generated by the PSID from 1968 to 1992, based on the number of family members by gender and age. By using the same methods, I create the same variables for 1999-2013.

⁵ Substituting a head's potential experience for a head's age in the regressions for diverse income dependent variables also gives very comparable results

which may affect family economic activities globally. ϵ_{it} is the error term, which is clustered by family to obtain standard errors robust to both serial correlation and heteroskedasticity.

IV. Data

The Panel Study of Income Dynamics (PSID) is one of the longest nationally representative panel data, and has collected a variety of socioeconomic information annually from 1968 to 1996, and biennially from 1997 on. In particular, it contains a set of variables related to employment history for household heads, from which whether and when a head experienced job displacement can be identified. Hence, the PSID have been extensively used to study the long-term effects of job displacement on family earnings and income in the literature. Although the PSID collected a wide set of diverse family income information, its documentation of family expenditure information was quite limited before 1999; family food expenditure and rents/mortgage payments were the only categories that the PSID collected for most years during this period from 1968 to 1997.

Since 1999, however, this limitation of the PSID has been alleviated significantly. The PSID began to collect data on a biennial basis after 1997, enlarging its sample size and the number of variables covered by the survey. Along these lines, it began in 1999 to collect extensive information on family expenditures for major durables and non-durables related to housing, transportation, health care, education, as well as food.⁶ Moreover, diverse family wealth information has also been collected biennially since 1999, covering a broad range of family wealth indicators, such as home equity, cash in hand (checking/savings account), net values of vehicles, business or farm, other estates, stocks, annuities, and non-collateralized debts.

⁶ Since 2005, the PSID has encompassed broader expenditure categories, such as expenses for home repair/maintenance, furnishing, clothing, and entertainment/vacation. For consistency of analysis, those variables are not used in the main analysis of this study.

Therefore, the PSID for 1999-2013 provides a distinctive opportunity to directly explore a topic that has heretofore received scant attention in the literature: how a husband's displacement impacts major family expenditures as well as diverse family income sources in the long-run, and, furthermore, how it changes the net values of a wide range of family savings and assets during the same time.

A. Constructing Annual Family Expenditures

In the 1999-2013 PSID, there are a number of inconsistencies in timing and time units across the extensive expenditure variables, unlike the variables related to family income and wealth. To minimize these inconsistencies, I develop a proxy for annual expenditures during the previous year of each interview year for each expenditure category.⁷ I then calculate total annual family expenditures for food, housing, transportation, health care, and education by summing up all the corresponding sub-component expenditure categories.

The specific sub-components summed up for each category are the following: the food expenditures include the annual expenditure for food-away-from-home, as well as that for food-at-home, which also includes the annual monetary value for delivered food and food stamps. The housing expenditures are calculated by summing up annual rent or mortgage payments, home utility expenses, such as electricity and heating, home insurance premiums, and property taxes.

The transportation expenditure refers to the summation of average annual expenses for purchasing or leasing car(s), other annual car operation costs such as fueling, car repair or

⁷ The variables related to annual family income in the PSID 1999-2013 mostly refer to the year prior to each survey year. However, all the variables related to family wealth refer to the time around the interview month which is mostly between March and May for each survey year, while the reference time for expenditure variables differs widely across expenditure categories. In this study, I consider each wealth variable as a proxy for the amount of wealth accumulated by the end of the year prior to each survey year. Similarly, I construct annual expenditure variables for each expenditure category to obtain a proxy capturing, as closely as possible, what a family spent for the year prior to each survey year. Refer to Appendix A for a more detailed description of the procedures for generating annual expenditure variables.

maintenance, car insurance premiums, and annual public transportation costs for using buses, taxis, and trains. Note that the mortgage payments within the housing expenditures and car-purchasing expenses within the transportation expenditures encompass some expenditures for durables as well as non-durables.

As for the health care expenditures, I sum the annual expenses for doctor appointments, surgery, dental treatment, hospitalization, nursing care, prescription medicine and health insurance. Lastly, the education expenditures encompass both annual school- related costs and child care costs. All the expenditures described above are deflated to 2013 dollar terms using CPI-U-RS from the Bureau of Labor Statistics.

Appendix Table 1 shows descriptive statistics for annual family expenditures for food, housing, transportation, health care, and education, with all the corresponding sub-component categories for the main sample. Housing expenditures account for the largest portion of these expenditures, about \$21,000 on average. The second and third largest categories are transportation and food expenditures, totaling \$15,000 and \$10,000, on average, respectively. The largest category of total annual family expenditures, encompassing food, housing, transportation, health care, and education adds up to \$56,000 on average.⁸

⁸ One issue in constructing larger expenditure categories by adding up multiple sub-components is that the greater the number of sub-components that are summed up, the worse the missing data problems become. To mitigate this missing data problem, I perform selective imputations for missing data of some variables such as home insurance, property tax, and car insurance, which have a relatively large amount of missing data. Furthermore, I do not include water/sewage expenses in housing expenditures because those expenses have a large amount of missing data, while accounting for a relatively small portion of the total expenditure for housing. Appendix Table 1 also shows the statistics of the variables containing the imputed variables above, and they appear to be comparable to those of the non-imputed ones. The total expenditures shown in the bottom of Appendix Table 1 are constructed by using the imputed variables to alleviate the missing data problem.

B. Job Displacement

Since 1968, the PSID has contained a series of questions that ask household heads about the reasons why they left their previous jobs or employers, if their jobs were changed recently.⁹ Based on the answers to those questions, job separation due to company closings, being laid off or fired is defined in this study as job displacement.¹⁰ Thus, I focus on the job separations which can be considered exogenous shocks to workers. Note that I employ the conventional definition of job displacement found in the previous studies on job displacement using the PSID (Stephens 2001; Stevens 1997).

By using those questions to investigate the causes of heads' recent job separations, I identify a husband's experience of job displacement and its timing for each household in the following way:¹¹ In a certain interview year, if a husband responds to these questions by stating that he had stopped working in a job he held the prior year, due to a company-closing, being laid off or fired, the husband is considered to have experienced job displacement between January of the year prior to the interview year and the interview month of the interview year (mostly from March to May). If a husband experienced multiple job displacements through multiple interview years, only the first observed job displacement is accounted for in this study, as Stephens (2001) and Stevens (1997) do. A primary reason for focusing on the first job displacement is because a household head's subsequent displacements following the head's first one were found to play a central role in generating the persistent earnings loss of displaced heads (Stevens 1997). This

⁹ More specifically, in the 1999 and 2001 waves, the PSID asked currently-working heads about the reasons for their job changes if they had worked in other jobs in the year prior to the interview year. It also asked currently-non-working heads about their most recent job, or up to two jobs that they had had in the year prior to the interview year, and recorded reasons why that job or jobs had been terminated. Since 2003, the PSID has begun to investigate up to four recent jobs which a head had had in the year prior to the interview year whether the head is currently working or not, and recorded the reasons for job separation(s) if the head no longer had the job(s) at the time of the interview.

¹⁰ According to Boisjoly, Duncan, and Smeeding (1998), of the respondents answering that they were laid off or fired in the PSID for 1968-1992, roughly 16% had actually been fired.

¹¹ The sample of this study, which is discussed later, consists of only households whose head has a spouse, and for these households, the husband is considered a default head by the PSID

finding implies that the subsequent job losses may be an important consequence of the first one. Thus, this study focuses on exploring the effect of the earliest job displacement of a husband since he started to be interviewed by the PSID.

This identification strategy for the first occurrence of job displacement works well before 1997, when the PSID collected the data annually. Since 1997, however, when the PSID began to collect the data biennially for each household head, it has systemically generated certain periods (mostly between June and December of odd-numbered years between 1997 and 2013), during which it is not possible to determine whether or not the head experienced job displacement. This is because the PSID has continued to document a head's reasons for job separations only for separations occurring in the previous year or current year of each interview year, even after it began to survey biennially after 1997.

This data limitation raises several issues that should be kept in mind when the regression results are interpreted in Section V of this paper. First, the effects of job displacement occurring in the second half of odd-numbered years during the 1997-2013 period cannot be identified. Hence, the estimated effect of job displacement in this study should be regarded more as an average effect accounting only for the displacements occurring in even numbered years or in the first quarter or first half of odd-numbered years between 1997 and 2013. Second, the sample of non-displaced husbands from the period of 1999 to 2013 identified in this study would include a fraction of husbands who were actually displaced in the second half of odd-numbered years during that earlier commencing period, 1997 to 2013. This would underestimate the effect of a husband's job displacement on family expenditures, and the degree of underestimation would depend on the percentage of the misidentified non-displaced compared to the correctly-identified

non-displaced.¹² Third, some instances of identifications of the first job displacement occurrence may be incorrect as they may have occurred in the second half of earlier odd-numbered years between 1997 and 2013.^{13 14 15}

C. Sample Selection

The main sample of this study consists of households which have both a husband (defined as the household head by the PSID) and his wife, whose ages are between 25 and 65 for each sample year.¹⁶ More specifically, for each male head (or husband) observed by the PSID at least twice during the period 1968-2013, I specify the earliest survey year when he reported a spouse satisfying the age criteria above. Then, from that survey year on, I include him and his family in the sample of this study unless he divorces, separates, misses/leaves the survey, or either his or his wife's age become over 65. Furthermore, I use only the households whose heads' labor

¹² In fact, the potentially misidentified group appears to account for just a small portion of the whole non-displaced group. Based on the observations in the second half of even-numbered years during 1997-2013, only 13% of heads experienced job separations, and among those separations, only 13% were due to job displacement. Hence the degree of underestimation is expected to be moderate. To further examine the degree of underestimation, I also performed a quasi-experiment, by only using the data of odd-numbered years (or even-numbered years) from the annual data set of the PSID during 1968-1997; the results show that the degree of underestimation is quite small. More detailed results are presented in Appendix Table 3.

¹³ These cases also seem to be minimal in number, according to the discussion in Footnote 12.

¹⁴ As a way of mitigating the misidentification problems for displaced husbands described here, I specify the husbands who were likely to experience displacement in the second half of the odd-numbered years between 1997 and 2013. This likelihood is judged by using other information on whether the head had some unemployed periods or received unemployment benefits around that time. I then drop some of the heads' observations which come after the period when they were suspected to be displaced. Even with this further sample restrictions, I find that all the main empirical results in this study hold robustly.

¹⁵ See Appendix Table 2 for detailed numbers of the first job displacement dummies by year, which are used by this study.

¹⁶ I use only national representative samples, the SRC (Survey Research Center) and immigrant samples of the PSID. That is, I exclude the SEO (Survey of Economic Opportunity) sample, which oversamples low-income families, and the Latino sample, which was dropped after 1995. The SRC sample refers to the nationally representative families who were selected in 1968 and their subsequent split-off families. The immigrant sample refers to national representative immigrants who were added to the PSID since 1997 to reflect the large increase in immigrants in the U.S. The PSID provides longitudinal (and therefore time-varying) family weights accounting for both the core and immigrant samples. From these weights, I calculate two types of fixed family weight for each family: first, I select the last observed family weight within a family. Second, I average out the family weights over time within a family. Both weights lead to quite comparable results. All the results shown hereafter are ones based on the first type of family weight.

earnings and total family income were positive for the whole observed period. Thus, the main sample of this study refers to relatively stable families in terms of their family structure, continuity of survey participation, and husband's attachment to the labor market. This sample stability is expected to be helpful for identifying the pure effects of the first job displacement of a husband, as Stephens (2001) discusses.

Among the households selected based on the criteria described above, only the families which were observed during the period 1999-2013 are used in the analyses because the main analysis of this study is on the various family expenditures and wealth data of the PSID during the same period. Moreover, to obtain a more consistent measure of job displacement occurrences, I drop the families which reported their male heads' displacement in the PSID waves prior to 1997, when the PSID collected data on an annual basis. As a result, the displaced husbands in the main sample of this study refer to those who were first observed to have job displacement in the 1997 PSID wave or later ones, while satisfying all the sample selection criteria listed above. Along the same lines, the non-displaced husbands in the main sample of this study indicate those who satisfy the same selection criteria as the displaced ones, except that they had never reported the experience of job displacement.

I further drop from the main sample the observations that have missing data for any variables used in the regression analyses of this paper. Consequently, the number of total observations of the main sample is 9,924 for 2,245 families.

D. Descriptive Statistics for the Non-displaced and Displaced

Table 1 presents the summary statistics for non-displaced and displaced families for the PSID waves 1999-2013. Those for the latter group are calculated by pooling all the *ex post*

observations after displacement, and those for the former group are based on the observations of the households whose heads have never been displaced, or have not yet been displaced during the period 1998-2012 (based on the PSID waves 1999-2013).

Table 1 shows that the displaced husbands and their spouses were, on average, slightly older than the non-displaced ones. The mean schooling years for the former were also somewhat lower than those of the latter. In addition, the displaced husbands were slightly less likely to be white. The other demographic variables, such as the number of children show fairly comparable mean values for both groups.

This study finds no significant difference in the probability of working in the manufacturing industry in a comparison of the two groups. The displaced husbands were more likely to work in blue-color jobs, however, and less likely to have a job covered by a union contract or to be a union member.

When comparing income levels, the difference between the two groups becomes more salient. The displaced husbands experienced rather large reductions in annual earnings and total family income, on average, after being displaced. Consequently, the proportion of the spouse's earnings in total family income increased considerably after a head's job displacement. A significant increase in the mean of public transfer is observed too, but the magnitude of the compensation is fairly small compared to the total income loss due to job displacement.

The next panel in Table 1 shows the statistics for family expenditures. With the large reduction in family income, the displaced families also seem to have reduced various family expenditures on average, but the magnitudes of decreases were relatively moderate compared to the average income loss. In addition, considerable reductions in the average value of various sub-components of family wealth are found in the panel at the bottom of Table 1. Taken together,

these observations imply that much of the expenditure smoothing was executed by the displaced families and their substantial dissaving/borrowing (or decrease in active saving) played an important role in alleviating the reduction in their expenditures.

Referring only to those unconditional means, however, is not sufficient to isolate the pure effects of job displacement. To clarify the role of job displacement further, I employ the fixed effect estimation method, which controls husbands' age effects, change in age compositions of family members, year effects, and each family's time-invariant unobservable components, as discussed in Section III. The regression results follow in the next section.

V. Results

Figure 1 presents both the main findings of this paper and how they compare to previous results in the literature. Specifically, the left panel A shows the average evolution of a displaced husband's annual earnings, his family's annual total income, and food and total expenditures during the period of 1998 to 2012 (the 1999-2013 waves of the PSID); the point estimates are in panel A of Table 2 and Table 3 which are later discussed. For comparison, the right panel B shows what Stephens (2001) finds by using the PSID for 1968-1992. As can be seen, all the corresponding graphs to those in panel A of Figure 1, except for total family expenditure, are found in panel B of the same figure. For both panels, point t on the x-axis indicates the year when the first displacement occurred, while the dotted horizontal line at zero on the y-axis implies the level of income or expenditures that a husband or his family would have without displacement. Note that in the remainder of this paper, all the quantitative comparison statements for displaced families made from regression results are based on this counter-factual horizontal

line, although, for the sake of brevity, I will generally not repeat this comparison criterion explicitly.

The two graphs at the bottom of panel A of Figure 1 first show that a displaced husband had a sizable and persistent earnings loss during the period 1998-2012, on average, and his earnings loss also led to a considerable fall in his total family income for the same period. Specifically, a displaced husband's annual earnings began to decline by 12% at two to two and a half years before displacement ($t-2$), and further decreased from the year of, or within a half year before displacement (t) through one and a half to two years after displacement ($t+2$), ending up with a 36% lower level compared to what he would earn without displacement. After three and a half to four years after displacement ($t+4$), his earnings showed a recovery pattern somewhat, but still remained at a 23% lower level even five and a half or more years after displacement ($t+6$ plus). The displaced family's total annual income also showed a similar dynamic pattern, although the magnitude of decrease was smaller in general; a displaced family had 8%, 13%, 23%, 20%, and 18% less annual total income during the periods $t-2$, t , $t+2$, $t+4$, and $t+6$ plus, respectively, relative to what it would have without its male head's displacement. All those decreases in a displaced husband's earnings and his family income are statistically significant (see Column (1) and (3) in Panel A of Table 2), and the decreasing patterns also appear comparable with those previously found by Stephens (2001) using the PSID 1968-1992 (see the graphs with square- and triangle shaped points in panel B of Figure 1).¹⁷

The smaller percentage fall in the total income of a displaced family compared to that of a displaced husband's earnings is partly due to the fact that a husband's earnings only account for 65-70% of his total family income in the main sample of this study (composition effects).

¹⁷ Note that I use the before-tax total family income, while Stephens (2001) uses the after-tax one, which was imputed by the PSID until the 1992 wave. The after-tax family income was not provided in the 1999-2013 PSID.

Moreover, the lesser fall might be partly induced by some increases in other family income sources, such as the spouse's earnings and public/private transfers, which offset a fraction of the earnings loss of a displaced husband (insurance effects). The two effects are difficult to disentangle from each other based solely on the results from the log dependent variable analyses shown in panel A of Figure 1 or Table 2. In the level dependent variable analyses presented in panel B of Table 2, however, we can see how each family income source was affected by a husband's displacement and ended up being aggregated into total family income in dollar terms, so that we may compare the composition and insurance effects more clearly.

Specifically, columns (1), (2), and (3) in panel B of Table 2 demonstrate the evolution of job displacement effects on husband's annual earnings, the sum of husband's and wife's annual earnings, and their total family annual income in 2013 dollar terms, respectively. Unlike the log dependent analyses seen in panel A, the level dependent variables for those columns in panel B have additive relationships with each other, as do all the corresponding regression coefficients as well. Hence, the differences in the coefficients in columns (1) and (2), and columns (2) and (3) in panel B indicate each individual effect of a husband's displacement on his wife's earnings and the other family income sources, respectively, in dollar terms.¹⁸

According to the results presented in panel B of Table 2, the gap in the percentage fall between a displaced husband's earnings and his family income appears to be mainly due to the composition effect rather than the insurance effect. Comparing the level differences in coefficients between the columns in panel B of Table 2, both a wife's earnings and other family income of a displaced husband turn out to have decreased slightly in dollar terms rather than increased during the period 1998 to 2012, although those differences are not statistically

¹⁸ Other family income sources include the earnings of family member(s) other than husband and wife, public/private transfers, interests/dividends from family assets.

significant. This observation suggests that other family income sources played a minimal role in buffering the earnings shock of displaced husbands during the period 1998-2012.¹⁹

Even with such a substantial reduction in the total family income of displaced families as shown in Figure 1/Table 2, they decreased their annual total expenditures only moderately during the period 1998-2012, as is also seen in the graph with diamond-shaped points in panel A of Figure 1.²⁰ In particular, a significant fall in their total expenditures appeared far later compared to that in their total income. For instance, the displaced families did not decrease their total expenditures significantly during the period between $t-2$ and t (see column (1) in panel A of Table 3 for the standard errors), despite the fact that they had a significant fall in their total annual income by 11% on average for the same period, as seen in Table 2. Roughly two years after a husband's displacement ($t+2$), the total family expenditure started to statistically significantly decline by 5%, and further decreased with stronger statistical significance for the subsequent period, so that the displaced heads' families showed 9% less total expenditures roughly four or more years after displacement (i.e., $t+4$ and $t+6$ plus), relative to what they would spend without a husband's displacement.

It is notable that this sluggish fall in total expenditures of displaced families is difficult to detect in what Stephens (2001) finds about their food expenditure behaviors alone by using the PSID 1968-1992. As seen in the graph with x-shaped points in panel B of Figure 1, he finds a significant earlier drop in their food expenditures even before the occurrence of displacement ($t-2$ and $t-1$). In addition, in his study, the degree of decrease in their food expenditures changed

¹⁹ This observation seems inconsistent with Stephens (2002)'s finding based on the 1968-1992 PSID that a displaced husband's wife increased her labor supply significantly and persistently before and after her husband's displacement. One factor driving this inconsistency might be the difference in the growth of female labor market participation in the United States between the periods 1968-1992 and 1999-2013; while there was a strong increasing trend in the female labor force participation rate (FLFP) during the former period, the growth in FLFP stagnated substantially during the latter period (Lee 2014).

²⁰ As explained earlier, total expenditures include expenditures for food, housing, transportation, health care, and education.

little over the whole post-displacement period, after their food expenditures had fallen by 9% in the year of displacement (t). Consequently, displaced families showed a flat trend in their food expenditures between the periods t and $t+6$ plus. Stephens (2001) regards this flat pattern as evidence of consumption smoothing of displaced families who anticipated much of their future income loss.

As for the food expenditures alone, the results of this study are comparable to those of Stephens' (2001) for displaced families. For example, the graph with x-shaped points in panel A of Figure 1 (or column (2) in panel A of Table 3) shows that displaced families had a significant early drop in their food expenditures over the initial period of time around the occurrence of displacement during the period 1998-2012; their food expenditures fell by 5% and 8% at $t-2$ and t , respectively, and those declines were statistically different from zero. Moreover, even roughly six or more years after displacement ($t+6$ plus), the decrease in their food expenditures appeared to be as much as in the earlier period t , although the full trajectory of their food expenditures between t and $t+6$ plus seems not as flat as observed in Stephens' (2001) results during the corresponding period.²¹

The initial decline of food expenditures, and their leveling off thereafter suggests that the sluggish fall in total expenditures including food expenditures would be driven by other non-food expenditures. Indeed, the other regression results using log dependent variables for non-food sub-expenditures, shown in column (3)–(5) in panel A of Table 3, displays a tendency for those non-food sub-expenditures to decline more slowly compared to the food expenditures. As discussed earlier regarding panel A of Table 2, however, it is hard to clearly see how each sub-

²¹ The smaller decreases in food expenditures of displaced families between $t+2$ and $t+4$ compared to the previous period appeared to be partly affected by a significant increase in their food stamp usage since $t+2$, during the period 1998-2012. Based on my replication of Stephens (2001) using the 1968-1992 PSID, however, no significant role of food stamp usage is found in food expenditure smoothing for displaced families, during the period 1967-1991.

expenditure category contributed to the dilatory decrease in total expenditures through the log dependent variable analyses. Moreover, the log dependent variable analysis has to drop some observations with zero values for each sub-expenditures regression, which leads to different sample sizes across the sub-expenditures analyses, as shown in panel A of Table 3. This constraint also impedes a fair comparison among them.

To mitigate the limitations of the log dependent variable analysis described above, I put the corresponding results of the level dependent variable analyses in the lower panel B of Table 3, as I do in Table 2. Specifically, columns (1)-(5) in panel B of Table 3 show the level effects of a husband's job displacement in 2013 dollar terms on total annual family expenditures and its exhaustive sub-components, such as annual family expenditures for food, housing, transportation, and health care/education, in that order. Correspondingly, I also depict five panels A through E in Figure 2 to visualize each result in columns (1)-(5) in panel B of Table 3, with 95% confidence intervals. As the measure of total family expenditures is the summation of the other sub expenditures above, each coefficient of job displacement dummies in column (1) of panel B is also the simple summation of the corresponding coefficients of the other sub-expenditure regressions from column (2) through (5) of panel B. Thus, it is possible to compare each sub-expenditures' contributions directly from panel B of Table 3, as can similarly be done in panel B of Table 2.

Overall, panel B of Table 3 shows comparable dynamic patterns for each sub-expenditure as well as total expenditures of displaced families with what we see in upper panel A of the same table. For example, column (2) in panel B of Table 3 (or panel B in Figure 2) shows an early significant fall in displaced families' food expenditures as does the same column in upper panel A; for both early periods $t-2$ and t , displaced families statistically significantly reduced their food

expenditures by \$800 and \$900, respectively. When it comes to the total expenditures for the same period (column (1) in panel B of Table 3), however, the declines appear not to be statistically different from zero, which is also consistent with the results shown in the same column of the upper panel. Referring to the corresponding estimates in columns (3) through (5) in panel B of Table 3 (or panels C, D, and E in Figure 2), the statistically insignificant fall in total expenditures at $t-2$ and t , turns out to have been mainly because displaced families did not have a significant fall in the other non-food sub-expenditures during the same periods, for housing, transportation, health care, and education.²²

From $t+2$ through $t+6$ *plus* in panel B of Table 3 (or in Figure 2), in contrast, displaced families began to significantly decrease their total expenditures by \$3,000-\$6,000, and in particular, this lagged fall in their total expenditures were mainly due to the sluggish downswing in their expenditures for housing, health care, and education during the same time. Specifically, at $t+2$, displaced families' total expenditures decreased by \$3,000, and the decline in their sub-expenditures for housing and health care/ education mostly accounted for the reduction in total expenditures. For the subsequent periods, $t+4$ and $t+6$ *plus*, displaced families spent \$6,000 less on total expenditures, on average, and their sub-expenditures for housing, and health care/education accounted for 50-30% and 30-50% of the total decrease in their total expenditures, respectively. It is notable that only 15% of the entire decline in their total expenditures from $t+2$ through $t+6$ *plus* can be attributable to the fall in their food expenditures, which a number of previous studies have relied on heavily to proxy people's consumption behavior.

²² For $t-2$, the displaced families' expenditures for transportation and health/education of displaced families increased rather than decreased point estimate-wise. This pattern suggests that the main purpose of the earlier decrease in their food expenditures might be to adjust the expenditure share across multiple expenditure categories in response to the increased risk of future income loss.

These dollar amounts of declines in total expenditures of displaced families shown in column (1) in panel B of Table 3 can be further compared to their family income losses in dollar terms for each corresponding period previously shown in panel B of Table 2. The comparison illustrates a large gap between the two: On the one hand, for example, displaced families had had \$30,000 lower total income (before tax) annually, on average, over roughly eight years for the post-displacement period (i.e., from t through $t+6$ plus).²³ This amount nearly equals the loss in their disposable family income of \$24,000.²⁴ On the other hand, they decreased their annual total expenditures only by \$4,000, on average, for the same post-displacement period, based on column (1) in panel B of Table 3. Therefore, the average gap between their disposable income loss and total expenditures decline appeared to be about \$20,000 in an accounting sense.

This gap can be explained either by a fall in the other sub-expenditures which are not included in the measure of total family expenditures of this study, or by their self-funding activities through reducing the net value of their own family wealth. While the former factor cannot be analyzed because of the lack of other expenditure information in the 1999-2013 PSID, the latter factor, self-funding behaviors of displaced families, can be explored by using extensive family wealth data in the same data set.

Table 4 shows in detail how a husband's job displacement affected various components of his family wealth from $t-2$ through $t+6$ plus. As in the previous analyses for the income/expenditures effects of job displacement, all the interpretations of the coefficients for job displacement dummies will be based on counter-factual wealth level which a family would have

²³ In this study, 8.7 years are the conditional sample mean of the maximum number of years that passed since the husband's first displacement, among the husbands having been first displaced roughly six or more years ago.

²⁴ The average tax rate for the sample of this study is 20 percent based on NBER TAXSIM9, which is a tax calculating program provided by NBER (<http://users.nber.org/~taxsim/taxsim-calc9/index.html>),

without its husband's displacement. But, for brevity, I will also frequently omit to explicitly mention the comparison criterion when describing the following results.

Column (1) in Table 4 first shows the evolution of total family wealth level of displaced families in 2013 dollar terms. The displaced families appeared to considerably reduce their own wealth for their expenditures smoothing: Their total family wealth declined by \$172,000 by the end of *t+6 plus*, on average, compared to what they would have without displacement, and this amount of reduction accounts for 45% of the average total family wealth of families in this sample. More specifically, they decreased the net value of their total family wealth by \$11,000 annually, on average, from the end of *t-2* through the end of *t+6 plus*.²⁵ This average annual decline in their total family wealth roughly covers 55% of the unexplained gap of \$20,000 between their disposable income loss and expenditures fall from *t* through *t+6 plus*, as previously computed based on the results in Table 2 and 3.

Moreover, the decreasing pattern in their total family wealth is consistent with the sluggish fall in their total family expenditures discussed in Table 3; displaced families decreased their total family wealth more intensively during the initial periods before the end of *t*, than they did during the latter periods after the end of *t*. Specifically, they had already reduced their total wealth by \$58,000 at the end of *t-2*, and further decreased it by \$29,000 by the end of *t* point estimate-wise, and thus their total family wealth was \$87,000 less at the end of *t*, on average, compared to what they would have without displacement. Hence, of the total average reduction in their total family wealth of \$172,000 by the end of *t+6 plus*, roughly 50% took place by the end of *t*.

²⁵ The difference in family wealth effects of job displacement between *t-2* and *t+6 plus* based on column (1) in Table 4 is -\$113,921, whose standard error is 45,538.

Notably, this early decrease in their total family wealth appears to have covered most of their family income loss which they had during the same period. Between the ends of $t-2$ and t , for instance, they decreased their total wealth by \$14,500 per year on average, point estimate-wise, according to column (1) in Table 4, and this decline roughly equals the loss in their *disposable* annual total income of \$15,000 at t , which is calculated based on the results in column (3) in panel B of Table 2.²⁶ This observation suggests that not only the expenditures included in this study, but also other expenditures not covered by this study were likely reduced only slightly by displaced families during the initial period around their husband's job displacement occurrence.

In addition, the speed of the decline in total family wealth of displaced families decelerated for the subsequent periods after t , and this slowdown also corroborates the finding of their dilatory reduction in total expenditures. Specifically, for about eight years, between the ends of t and $t+6$ plus, they decreased their total family wealth by \$10,000 per year, on average.²⁷ This amount covers only 40% of the average annual loss of \$27,000 in the total disposable family income that they had had since $t+2$.²⁸ Inversely, this computation implies that the other 60% of the disposable income loss of displaced families was offset, in an accounting sense, through a decrease in their expenditures since $t+2$. This conjecture is in keeping with the previous finding that displaced families decreased their total expenditures relatively slowly; a significant fall in their total expenditures had begun to appear in $t+2$.²⁹

²⁶ The difference in family wealth effects of job displacement between $t-2$ and t based on column (1) in Table 4 is -\$28,716, whose standard error is 23,114.

²⁷ The difference in family wealth effects of job displacement between t and $t+6$ plus based on column (1) in Table 4 is -\$85,205, whose standard error is 36,103.

²⁸ It is calculated based on the estimates in panel B of Table 2

²⁹ This further implies that the total expenditures of this study related to food, housing, transportation, health care and education have relatively low income elasticity compared to the other expenditures that are not covered by this study: as seen earlier, displaced families decreased their expenditures for food, housing, transportation, health care and education only by \$5,000 per year, on average, from $t+2$ through $t+6$ plus. This accounts for less than 30% of \$17,000, which is the average difference between disposable income loss and reduction in their family wealth.

Columns (2) through (8) in Table 4 further present the individual regression results for each sub-component of total family wealth, such as the net value of housing, vehicles, cash in hand (checking/saving), stocks, business/farm, individual retirement account (IRA), and other assets, in 2013 dollar terms.³⁰ As in panel B of Table 3, all the coefficients in column (1) of Table 4 are the mere summation of the corresponding ones in column (2) through (8) in the same table. Hence, we can compare each sub-component's contribution to the decrease in total family wealth for each period.

As for the early decrease in total family wealth by the end of t , for example, its decrease in displaced families was largely driven by falls in the (net) values of their home equity, stocks, and family business/farm. In particular, the early reductions in the net values of their stocks and business/farm were so large that the average dollar amounts of both declines by the end of t were up to 50- 60% of each corresponding mean dollar value of the entire sample in this study. In turn, the decrease in the net values of their vehicle and checking/saving accounts was relatively moderate by the end of t , while the net values of their IRA appeared to even increase during the same time, although the estimate for the IRA increase shows relatively weak statistical significance.

These decreasing patterns across the subcomponents of family wealth, however, had changed since the end of t . On the one hand, specifically, the further decrease in total family wealth of displaced families was largely driven by the additional fall in the net values of their checking/saving accounts, stocks and IRA taking place since the end of t . In particular, the net values of their checking/saving accounts and IRA decreased so prominently from the end of t through the end of $t+6$ *plus* relative to the preceding period, that their contributions to the entire

³⁰ The vehicles include cars, trucks, a motor home, a trailer, or a boat, while the other assets include the net values of other estate and non-collateralized debts

decrease in their total family wealth at the end of $t+6$ plus became much larger. On the other hand, in contrast, there was no further significant decrease in the (net) values of their home equity and business/farm from the end of t through the end of $t+6$ plus, although both of them played a central role in the early decrease in their total family wealth by the end of t . As a result, the contribution of the decline in the (net) values of their home equity and business/farm to the decrease in their total family wealth became much smaller at the end of $t+6$ plus than the earlier period.

The relatively early decline by the end of t in the (net) values of home equity, stocks, and business/farm of displaced families can be viewed as their early downsizing of the share of relatively illiquid/risky assets in response to their increased future income risk, by putting less money into them than they would have done without the displacement. However, given that their housing expenditures continued to decrease over time as seen in column (3) of Table 3, the early decrease in their home equity and its subsequent flat path through $t+6$ plus appears somewhat puzzling. Through additional analyses on the change in their home price, which is the summation of home equity and debt for home, and the probability of their moving to a lower-/higher priced home before and after the displacement, I find that their home price began to decline at $t-2$ as their home equity did, but also continued to decrease over time through $t+6$ plus, as opposed to the non-decreasing trend in their home equity during the same time.³¹ Moreover, such patterns in their home price were partly due to a lower likelihood of a move to higher-priced homes by t , and a higher likelihood of a move to lower-priced homes after t through $t+6$ plus, relative to their counterparts who had not experienced job displacement.³² These findings partly explain the seemingly inconsistent pattern of changes in home equity and housing expenditures of displaced

³¹ Refer to Appendix Table 4 for detailed regression results.

³² Refer to Appendix Table 5-Appendix Table 8 for detailed regression results.

families: The displaced families became more likely to move to lower-priced homes with lower-home debt over time after displacement, than they would have done without displacement. As a result, their average home price kept going down over time, which made the fall in their average housing expenditures (mainly the mortgage payments) more salient as time lapsed, whereas their home equity did not further decrease because their home debt also decreased commensurate with the drop in home price.

VI. Summary and Discussion

The results of this study translate into two main findings: First, the households with displaced husbands practiced considerable expenditure smoothing mainly by reducing a large share of their own wealth during the period 1998-2012. Second, the total expenditures of displaced families fell sluggishly, although there began to be a significant fall in total family income much earlier, even before the occurrence of displacement. In this section, I briefly review the main results related to each finding, and then further discuss their respective implications.

A. Displaced Families' Expenditure Smoothing by Reducing Their Own Wealth

This study shows that during the period 1998-2012, a displaced family had 18% less total annual income, on average, over six or more years after a husband's displacement (i.e., from t to $t+6$ plus), relative to what it would have without a husband's displacement. For the same time, despite the substantial loss in family income, the displaced family decreased its annual total expenditures only by 7%, on average, which total expenditures encompass a broad set of major expenditure categories related to food, housing, transportation, health care, and education. As a result of this large expenditure smoothing, displaced families ended up with \$172,000 less family

wealth, on average, at the end of $t+6$ plus, which accounts for 45% of the average net value of family wealth in the whole sample of this study. Particularly for the post-displacement period from the end of t through the end of $t+6$ plus, for example, families decreased their total wealth by \$11,000 annually, on average, and this amount roughly offset 55% of the loss of its disposable annual income during the same time.

These findings of this study are consistent, overall, with Stephens (2001), in that a relatively moderate fall in expenditures of displaced families was observed. Specifically, Stephens (2001), by using the 1968-1992 PSID, finds a moderate fall in food expenditures over a long period for displaced families, compared to the large income loss they persistently had. The author views the finding as evidence of consumption smoothing of displaced families. Along the same line, the current study reexamines the long-term expenditure behaviors of displaced families by using richer information about their family expenditures, and the results largely confirm Stephens' (2001) argument: even with a broad set of expenditures categories including housing, transportation, health care, and education, as well as food, displaced families turned out to practice considerable expenditure smoothing during the post-displacement period. This finding of the current study again calls attention to the importance of investigating the expenditure effects of job displacement for assessing the true welfare loss caused by job displacement. As Stephens (2001) argues, simply referring to the income loss induced by displacement is likely to overestimate the actual long-run impact of job displacement on people's welfare.

Through further analyses on wealth change of displaced families, however, this study highlights the fact that such a large expenditure smoothing of displaced families was enabled at the cost of a large share of their family wealth that they would have without displacement. This finding invites consideration of two scenarios where a husband's job displacement could

severely damage a family's welfare: first, a family with a low level of wealth, thus presumably also having a relatively tight borrowing constraint, would have to decrease their family expenditures more drastically; and, second, even a family with a relatively high level of wealth likely becomes more financially vulnerable over time once it experiences a husband's job displacement, because a displaced family tends to have an early large depletion of, and gradual subsequent declines in its family wealth, as seen in Table 4.

This study further suggests that the existing public assistance program did not play a substantial role in mitigating the two problems described above in Table 2. In the Appendix Table 9, an extended version of panel B in Table 2, which presents the level job displacement effects for each sub-component of family income, it is observed that there was statistically significant increases in public transfers in dollar terms for displaced families, on average, at t , $t+2$, and $t+4$, but the magnitudes of the increases were trivial. In addition, a large part of the increase was concentrated on the initial periods around the displacement occurrence at t , and thus displaced families were likely to have less public transfer over time after displacement.

B. The Sluggish Fall in Displaced Families' Expenditures

Another noteworthy finding of this paper is that the decrease in displaced families' expenditures became more salient over time. In fact, they did not decrease the total family expenditures significantly during the initial period around displacement, although their total income was significantly lowered by 12%, during the same time. A significant fall in total expenditures of 5% began to appear roughly two years after displacement ($t+2$), and the total expenditures decreased further point estimate-wise for the subsequent years, resulting in 9% less annual total expenditures from $t+4$ through $t+6$ *plus*. I further show that this lagged fall would

appear in general even with a broader measure of family total expenditures than that of the current study, by tracking their decreasing patterns of total family wealth and comparing it with their concurrent income loss in an accounting sense.³³

This sluggish fall in displaced families' total expenditures is a novel finding, which is not found in their food expenditure behavior alone, as shown in both the current study and Stephens (2001) (see Figure 1). Furthermore, the interpretation of the lagged fall in total expenditures of displaced families seems more complex than that of the flatter trend in their food expenditures with an early significant fall, under classical assumptions of standard life cycle theories/permanent income hypothesis. Why, for example, did the displaced families not begin to reduce their total expenditures earlier so as to make their consumption path more even, even though a large number of them appeared to expect future income loss and prepare for it in advance by reducing some part of their expenditures and wealth even before displacement?

There are at least two possible explanations for this lagged fall that would answer this question. First, the lagged decrease in their total expenditures could be attributable to the difference in adjustment costs across sub-expenditure categories of the total expenditures. For example, the food expenditures can be adjusted relatively easily while the expenditures for housing generally require more time and money costs for adjustment. Health care and education expenses are also relatively difficult to adjust if some family members are getting ongoing treatments or already enrolled in schools. This different adjustment costs can lead to a large difference in the timing of change across food expenditures and the other sub-expenditures shown in Table 3. Thus, no matter how precisely the displaced families expect the future income loss due to their heads' displacement, they might optimally choose to postpone a decrease in

³³ Specifically, they appeared to decrease their wealth level enough to roughly cover the entire income loss they had by t , whereas the decrease in their wealth for subsequent periods only covered 30% of the income loss that they had during the same time.

expenditures for some categories with high adjustment costs in order to minimize it, which lead to a lagged decrease in their total expenditures.

The second possible explanation is that their expectation of persistent (or permanent) income loss due to job displacement might change systematically over time. In other words, they might underestimate the persistent effect of job displacement on their earnings at initial stages, on average (from an *ex post* perspective), yet continue to update their expectations as time lapses, which leads to a further decrease in their total expenditures.

There are a couple of factors which can cause such systematic expectation errors on the income effect of job displacement. First, a large economic shock could change people's expectations. The sample years of this study, 1998-2012, include two recession periods: 2002-2003 and 2008-2009, the latter a particularly severe recession that has been termed as the Great Recession (Elsby et al. 2011). Therefore, the families in the main sample of this study were likely to be affected by such a large economic shock and might, as a result, change their future expectations.

Second, undergoing typical processes of persistent earnings losses after the first job displacement may necessarily entail people's expectation adjustments. For example, Stevens (1997) finds that multiple job losses following the first job loss account for much of the persistent reductions in earnings due to job displacement. The experience of such subsequent job losses would lower people's expectations of their future income paths gradually, which, in turn, would lead to gradual falls in their expenditures over time.

Appendix Table 10 shows some evidence that both factors above, the Great Recession shock and multiple job losses, played a role in generating the lagged decrease in total family expenditures of displaced heads. Specifically, column (1) in Appendix Table 10 refers to the

effect of displacement on total family expenditures which is the same as column (1) in Table 3. Columns (2) and (3) in Appendix Table 10 show how the Great Recession and subsequent job displacements, respectively, affected their total expenditures during the post-first-displacement period. Overall, both factors appeared to affect the lagged reduction in their total expenditures point estimate-wise; in particular, the Great Recession made a relatively significant contribution to the decrease in their total expenditures at $t+4$, while the subsequent job losses of their heads appeared to play a statistically significant role in further decreasing their total expenditures, in the current year or a half year before the occurrence of the subsequent job losses. When I include all the interaction terms for the Great Recession and the heads' subsequent job losses in my original model (column (4)), it can be observed that the lagged decrease in their total expenditures due to heads' first displacement becomes smaller in terms of both point estimate and statistical significance. This suggests that displaced families might change their future expectation of life family income while experiencing unexpected additional shocks after their heads' first displacement.

VII. Conclusion

During the period 1998-2012, families with a displaced husband practiced substantial expenditure smoothing over a long period from roughly two years before through six or more years after displacement, notwithstanding the sizable persistent income loss that they experienced over the same period of time. In particular, their expenditures decreased only slightly in the initial periods around the year of displacement, but the decline in their expenditures became more salient as time went on. It is noteworthy that this large expenditure smoothing was enabled mainly by a considerable decrease in savings/assets of displaced families.

For about six or more years since the year of displacement, the average annual decrease in their wealth covers roughly 55% of the average annual loss in their disposable income. In turn, the average decline in their annual expenditures for food, housing, transportation, health care and education explains about 20% of the average annual loss in their disposable income during the same time.

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Figure 1. The Effects of Husband's Job Displacement on Annual Earnings, Family Income, and Expenditures

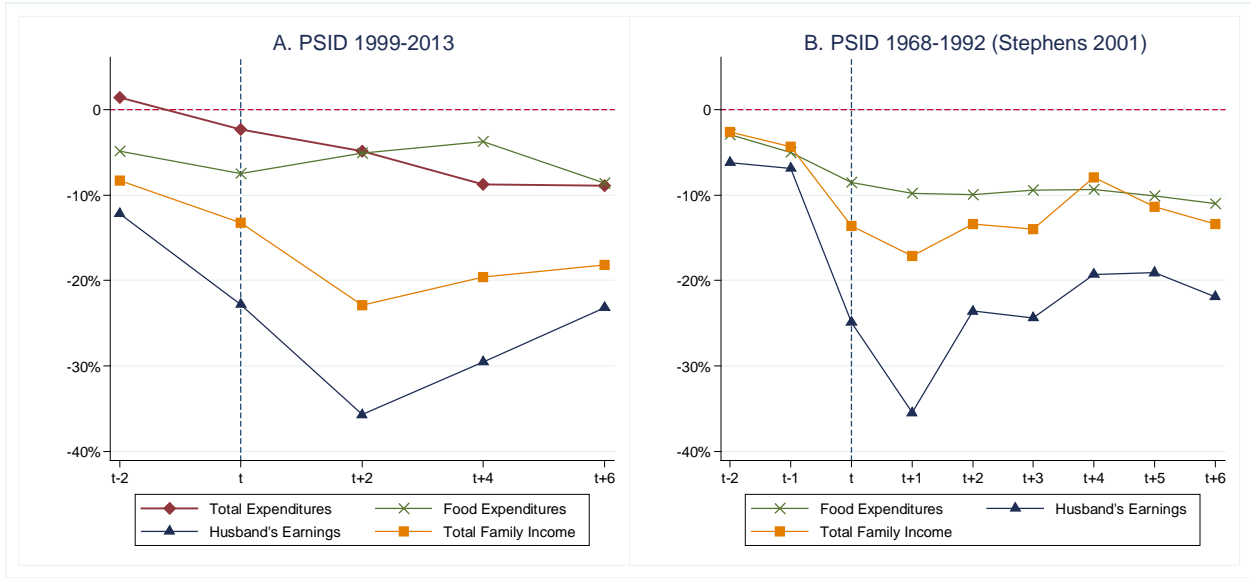


Figure 2 The Effects of Husband's Job Displacement on Family Expenditures in Dollar Terms

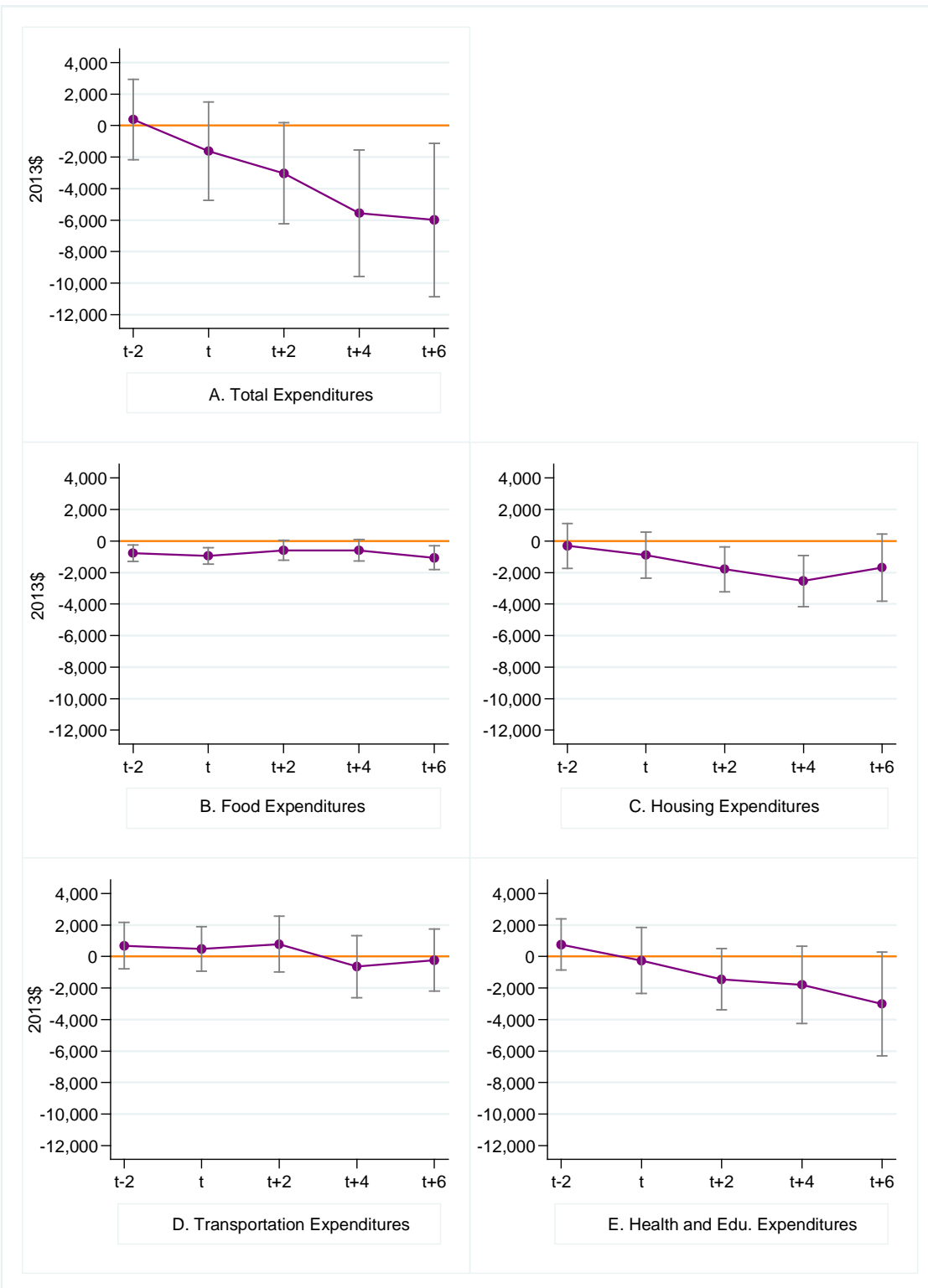


Table 1. Descriptive Statistics for Non-displaced and Displaced Families (PSID 1999-2013)

Variables	Non-displaced 1999-2013		Displaced 1999-2013	
	Mean(SD)	N	Mean(SD)	N
Head's Age	42.74 (10.04)	8,561	44.07 (9.77)	1,363
Head's Education (Years)	14.25 (2.70)	8,470	14.03 (2.64)	1,355
Wife's Age	41.12 (9.87)	8,561	42.57 (9.55)	1,363
Wife's Education (Years)	14.39 (2.50)	8,473	14.04 (2.76)	1,338
Percentage of White Heads	0.86 (0.35)	8,561	0.80 (0.40)	1,363
Number of Children (0-17)	1.23 (1.20)	8,561	1.33 (1.27)	1,363
Number of Young Children (0-5)	0.42 (0.71)	8,561	0.40 (0.68)	1,363
Percentage of Manufacturing Industry	0.19 (0.39)	8,561	0.20 (0.40)	1,363
Percentage of Blue-Collar Workers	0.31 (0.46)	8,561	0.41 (0.49)	1,363
Percentage of Jobs Covered by Union Contract	0.14 (0.34)	8,561	0.08 (0.26)	1,363
Percentage of Union Members	0.12 (0.33)	8,561	0.07 (0.25)	1,363
Family Annual Income (2013\$)	133,159 (180,928)	8,561	103,650 (75,160)	1,363
Head's Earnings	86,846 (155,902)	8,561	64,291 (60,857)	1,363
Wife's Earnings	32,131 (36,682)	8,561	28,110 (31,661)	1,363
Public Transfer	983 (3,973)	8,561	3,022 (6,794)	1,363
Private Transfer	3,000 (16,454)	8,561	2,224 (10,044)	1,363
Other Income	10,200 (42,905)	8,561	6,002 (17,176)	1,363
Total Annual Expenditure (2013\$)	56,683 (31,025)	8,561	52,358 (26,299)	1,363
Food	10,482 (5,269)	8,561	10,016 (4,614)	1,363
Housing	21,723 (16,699)	8,561	19,843 (12,901)	1,363
Transportation	16,234 (12,746)	8,561	14,684 (11,088)	1,363
Health Care	3,861 (4,900)	8,561	3,929 (4,009)	1,363
Education	4,383 (9,842)	8,561	3,886 (9,210)	1,363
Total Family Wealth (2013\$)	396,807 (1,004,994)	8,561	262,111 (507,842)	1,363
Home Equity	123,594 (190,764)	8,561	99,337 (181,102)	1,363
Total Vehicle(s) Value	22,393 (27,246)	8,561	16,204 (17,150)	1,363
Checking/Saving	32,764 (109,175)	8,561	20,649 (61,321)	1,363
Stock	55,685 (311,796)	8,561	33,396 (130,543)	1,363
Business/Farm	66,722 (558,822)	8,561	15,873 (153,372)	1,363
IRA	55,198 (160,614)	8,561	50,089 (152,592)	1,363
Other Wealth	40,452 (277,948)	8,561	26,563 (170,223)	1,363

Table 2. The Effects of Husband's Job Displacement on Family Income (PSID 1999-2013)

	(1)	(2)	(3)
	Husband's Earnings	Husband's and Wife's Earnings	Total Family Income
Job Displacement			
A. Log Dependent Variable			
2 - 2.5 years before (<i>t-2</i>)	-0.122** (0.051)	-0.071** (0.031)	-0.083*** (0.023)
Current year - 0.5 year before (<i>t</i>)	-0.228*** (0.056)	-0.180*** (0.044)	-0.132*** (0.033)
1.5 - 2 years after (<i>t+2</i>)	-0.357*** (0.066)	-0.256*** (0.043)	-0.229*** (0.034)
3.5 - 4 years after (<i>t+4</i>)	-0.295*** (0.074)	-0.214*** (0.053)	-0.196*** (0.044)
5.5+ years after (<i>t+6 plus</i>)	-0.232*** (0.073)	-0.188*** (0.053)	-0.182*** (0.044)
Observations	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245
B. Level Dependent Variable (2013\$)			
2 - 2.5 years before (<i>t-2</i>)	-13,340*** (3,962)	-13,929*** (4,149)	-16,959*** (4,886)
Current year - 0.5 year before (<i>t</i>)	-17,385*** (6,024)	-19,080*** (6,287)	-18,197*** (6,931)
1.5 - 2 years after (<i>t+2</i>)	-29,475*** (5,786)	-32,502*** (6,103)	-35,198*** (6,630)
3.5 - 4 years after (<i>t+4</i>)	-27,761*** (6,885)	-30,753*** (7,587)	-32,872*** (7,967)
5.5+ years after (<i>t+6 plus</i>)	-28,863*** (9,591)	-33,444*** (10,249)	-35,105*** (10,561)
Mean (SD)	83,777 (146,838)	115,361 (152,815)	129,144 (170,737)
Observations	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245

Note: Robust standard errors are presented in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3. The Effects of Husband's Job Displacement on Family Expenditures (PSID 1999-2013)

	(1)	(2)	(3)	(4)	(5)
	Total Expenditure	Food	Housing	Transportation	Health+Edu
Job Displacement					
A. Log Dependent Variable					
2 - 2.5 years before (<i>t-2</i>)	0.014 (0.022)	-0.049* (0.029)	0.020 (0.032)	0.041 (0.052)	0.141 (0.090)
Current year - 0.5 year before (<i>t</i>)	-0.023 (0.028)	-0.075** (0.030)	-0.006 (0.036)	0.019 (0.055)	-0.019 (0.117)
1.5 - 2 years after (<i>t+2</i>)	-0.049* (0.028)	-0.051 (0.035)	-0.061 (0.038)	0.064 (0.057)	-0.140 (0.117)
3.5 - 4 years after (<i>t+4</i>)	-0.087** (0.034)	-0.037 (0.034)	-0.063 (0.044)	-0.062 (0.067)	-0.105 (0.138)
5.5+ years after (<i>t+6 plus</i>)	-0.089** (0.036)	-0.086** (0.036)	-0.005 (0.055)	-0.033 (0.069)	-0.306** (0.144)
Observations	9,924	9,922	9,825	9,817	9,687
Number of Families	2,245	2,245	2,242	2,245	2,232
B. Level Dependent Variable (2013\$)					
2 - 2.5 years before (<i>t-2</i>)	378 (1,299)	-776*** (263)	-303 (727)	690 (751)	767 (827)
Current year - 0.5 year before (<i>t</i>)	-1,622 (1,593)	-943*** (269)	-892 (751)	470 (719)	-257 (1,068)
1.5 - 2 years after (<i>t+2</i>)	-3,033* (1,637)	-583* (324)	-1,797** (727)	788 (901)	-1,441 (992)
3.5 - 4 years after (<i>t+4</i>)	-5,571*** (2,046)	-590* (347)	-2,538*** (823)	-645 (1,005)	-1,798 (1,253)
5.5+ years after (<i>t+6 plus</i>)	-5,984** (2,482)	-1,057*** (390)	-1,691 (1,085)	-225 (1,002)	-3,011* (1,677)
Mean (SD)	56,095 (30,460)	10,419 (5,187)	21,467 (16,247)	16,023 (12,544)	8,186 (11,346)
Observations	9,924	9,924	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245	2,245	2,245

Note: Robust standard errors are presented in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4. The Effects of Husband's Job Displacement on Family Wealth in 2013\$ Terms (PSID 1999-2013)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Family Wealth	Home Equity	Total Vehicle(s) Value	Checking /Saving	Stocks	Business/Farm	IRA	Other
Job Displacement								
2 - 2.5 years before (<i>t-2</i>)	-58,218** (27,639)	-19,198** (7,601)	1 (1,495)	-11,168*** (3,881)	-7,024 (14,748)	-32,225** (13,765)	13,709 (10,947)	-2,314 (12,918)
Current year - 0.5 year before (<i>t</i>)	-86,934*** (27,117)	-21,497** (10,181)	-2,186* (1,252)	-9,083* (4,955)	-25,988** (13,132)	-34,659*** (12,620)	18,914 (12,097)	-12,435 (10,879)
1.5 - 2 years after (<i>t+2</i>)	-121,837*** (31,696)	-15,720 (10,616)	-1,574 (1,417)	-18,976*** (4,620)	-22,302 (13,995)	-36,480** (16,612)	-6,832 (9,673)	-19,952 (12,211)
3.5 - 4 years after (<i>t+4</i>)	-118,482*** (37,534)	-16,283 (10,752)	-4,918*** (1,633)	-23,147*** (5,699)	-29,680* (15,947)	-35,764** (18,217)	6,458 (16,115)	-15,148 (13,429)
5.5+ years after (<i>t+6 plus</i>)	-172,139*** (48,725)	-20,759 (13,398)	-5,467** (2,136)	-28,830*** (7,350)	-49,890** (21,570)	-39,312 (25,502)	-12,350 (15,368)	-15,530 (17,748)
Mean (SD)	378,480 (953,822)	120,294 (189,652)	21,551 (26,188)	31,116 (104,047)	52,652 (293,877)	59,803 (522,772)	54,503 (159,548)	38,562 (265,904)
Observations	9,924	9,924	9,924	9,924	9,924	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245	2,245	2,245	2,245	2,245	2,245

Note: Robust standard errors are presented in parentheses (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$.

Appendix Table 1. Summary Statistics for Family Expenditures (PSID 1999-2013)

	PSID 1999-2013				
	Mean(SD)	N	# of Zeros	Cond. Mean for Non-zeros (SD)	# of Missing
Annual Expenditure Variables (2013\$)					
Food	10,419 (5,187)	9,924	2	10,420 (5,185)	0
Food-at-home	7,398 (3,793)	9,924	44	7,424 (3,773)	0
Food-away-from-home	2,906 (2,875)	9,924	414	3,037 (2,871)	0
Food Stamps	115 (819)	9,924	9,583	3,970 (2,823)	0
Housing	21,502 (16,596)	8,945	99	21,706 (16,541)	979
Rent	1,757 (5,146)	9,924	8,268	12,027 (7,599)	0
Mortgage Payments	13,353 (14,270)	9,924	2,785	18,419 (13,695)	0
Home Utility	3,178 (2,099)	9,603	198	3,240 (2,072)	321
<i>Electricity</i>	1,513 (1,100)	9,924	895	1,652 (1,044)	0
<i>Heating</i>	1,136 (1,210)	9,924	2,193	1,440 (1,191)	0
Home Utility	2,648 (1,594)	9,924	203	2,699 (1,566)	0
Home Insurance	825 (891)	9,119	1,944	1,016 (885)	805
Property Tax	2,905 (3,472)	9,472	1,893	3,518 (3,528)	452
Housing (w/ imputed subcomponents)	21,467 (16,247)	9,924	99	21,651 (16,194)	0
Home Insurance w/ imputation	831 (865)	9,924	1,944	1,005 (854)	0
Property Tax w/ imputation	2,878 (3,419)	9,924	1,928	3,468 (3,470)	0
Transportation	15,187 (11,926)	9,396	107	15,368 (11,880)	528
Total Car Expenditure	14,856 (11,691)	9,396	201	15,182 (11,608)	528
<i>For Buying Car#1</i>	3,476 (6,230)	9,924	5,163	7,328 (7,321)	0
<i>For Buying Car#2</i>	1,080 (2,951)	9,924	7,667	4,964 (4,556)	0
<i>For Buying Car#3</i>	212 (1,167)	9,924	9,182	2,829 (3,286)	0
<i>For Leasing Car#1</i>	400 (1,766)	9,924	9,391	7,060 (2,832)	0
<i>For Leasing Car#2</i>	111 (942)	9,924	9,777	7,064 (2,742)	0
<i>For Leasing Car#3</i>	11 (311)	9,924	9,911	7,226 (3,268)	0

Appendix Table 1. (Continued) Summary Statistics for Family Expenditures (PSID 1999-2013)

Annual Expenditure Variables (2013\$)	PSID 1999-2013				
	Mean(SD)	N	# of Zeros	Cond. Mean for Non-zeros (SD)	# of Missing
<i>For Additional Car(s)</i>	2,336 (4,341)	9,924	6,374	6,666 (4,990)	0
<i>Car Operation</i>	7,205 (6,545)	9,396	203	7,365 (6,528)	528
<i>Car Insurance</i>	2,130 (2,805)	9,396	268	2,190 (2,821)	528
<i>Gasoline/Fuel</i>	2,997 (2,398)	9,924	247	3,074 (2,380)	0
<i>Car Repair</i>	2,007 (4,752)	9,924	4,990	4,064 (6,112)	0
<i>Car Parking/Pooling</i>	84 (531)	9,924	9,017	876 (1,494)	0
Public Transportation	331 (2,242)	9,924	8,851	2,864 (6,020)	0
<i>Bus/Train</i>	101 (566)	9,924	9,276	1,406 (1,627)	0
<i>Taxi</i>	25 (213)	9,924	9,636	824 (924)	0
<i>Other</i>	206 (2,112)	9,924	9,550	5,129 (9,280)	0
Transportation (w/ imputed car-insurance)	16,023 (12,544)	9,924	107	16,204 (12,498)	0
Car Expenses (w/ imputed car-insurance)	15,692 (12,276)	9,924	201	16,018 (12,190)	0
<i>Car Operation (w/ imputed car-insurance)</i>	8,065 (7,323)	9,924	203	8,234 (7,305)	0
<i>Car Insurance w/ imputation</i>	2,977 (4,302)	9,924	287	3,061 (4,333)	0
Education	4,315 (9,760)	9,924	4,258	7,636 (11,967)	0
Child Care	1,112 (3,453)	9,924	7,555	5,085 (5,858)	0
School	3,203 (9,255)	9,924	5,532	7,109 (12,741)	0
Health Care	3,870 (4,789)	9,924	406	4,026 (4,819)	0
Doctor/Surgery/Dental	809 (1,370)	9,924	1,463	938 (1,434)	0
Prescription/Drugs	376 (765)	9,924	1,427	436 (807)	0
Hospital/Nursing Home	370 (1,519)	9,924	6,512	1,120 (2,480)	0
Health Insurance	2,316 (3,716)	9,924	2,321	3,018 (3,985)	0
Total (Food, Housing, Transportation, Health, & Education)	56,095 (30,460)	9,924	0	56,095 (30,460)	0

Appendix Table 2. The Number of the Job Displacement Dummies (PSID 1999-2013)

	Survey Year								Total
	1999	2001	2003	2005	2007	2009	2011	2013	
1st Job Displacement Dummy									
2 - 2.5 years before (t-2)	24	35	25	45	58	56	43	0	286
Current year - 0.5 year before (t)	22	31	39	30	48	87	66	44	367
1.5 - 2 years after (t+2)	29	22	27	36	27	41	80	61	323
3.5 - 4 years after (t+4)	0	24	21	23	32	30	43	73	246
5.5+ years after (t+6 plus)	0	0	19	32	53	82	107	134	427

Appendix Table 3. The Effects of Husband's Job Displacement on Family Food Expenditure (PSID 1968-1997)

	Dependent Variables: Log Annual Food Expenditure				
	(1) All years	(2) Odd-numbered years	(3) Odd-numbered years	(4) Even-numbered years	(5) Even-numbered years
Job Displacement Dummies					
1-2 year(s) before (2 years before for (2)-(5))	-0.046*** (0.014)	-0.069*** (0.024)	-0.057** (0.024)	-0.037 (0.027)	-0.035 (0.027)
Current year or 1 year after (Current year for (2)-(5))	-0.074*** (0.015)	-0.084*** (0.025)	-0.079*** (0.024)	-0.078*** (0.025)	-0.075*** (0.025)
2-3 years after (2 years after for (2)-(5))	-0.078*** (0.016)	-0.090*** (0.026)	-0.085*** (0.026)	-0.114*** (0.030)	-0.112*** (0.029)
4-5 years after (4 years after for (2)-(5))	-0.081*** (0.017)	-0.098*** (0.027)	-0.093*** (0.026)	-0.073** (0.029)	-0.069** (0.029)
6+ years after	-0.077*** (0.019)	-0.085*** (0.028)	-0.080*** (0.027)	-0.084*** (0.030)	-0.077*** (0.029)
Dropping all the heads displaced in even-numbered years		Yes	No		
Including all the heads displaced in even-numbered years and assuming they're not displaced		No	Yes		
Dropping all the heads displaced in odd-numbered years				Yes	No
Including all the heads displaced in odd-numbered years and assuming they're not displaced				No	Yes
Observations	39,595	16,339	19,928	15,927	19,667
Number of Families	4,028	3,403	4,003	3,210	3,848

Note: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 4. The Effects of Husband's Job Displacement on Home Equity, Home Price, and Housing Expenditures in 2013\$ Terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Home Equity	Home Price	Housing Expenditures	Rent	Mortgage Payments	Electricity	Heating	Property Tax	Home Insurance
Job Displacement									
2 - 2.5 years before (t-2)	-19,198** (7,601)	-19,019** (9,032)	-303 (727)	-116 (277)	-239 (746)	49 (61)	24 (76)	-36 (124)	15 (50)
Current year - 0.5 year before (t)	-21,497** (10,181)	-27,698** (12,556)	-892 (751)	-165 (313)	-663 (751)	1 (67)	102 (159)	-184 (141)	17 (85)
1.5 - 2 years after (t+2)	-15,720 (10,616)	-37,123*** (13,077)	-1,797** (727)	232 (346)	-1,511** (730)	32 (74)	-38 (96)	-408*** (141)	-103* (59)
3.5 - 4 years after (t+4)	-16,283 (10,752)	-44,247*** (13,092)	-2,538*** (823)	261 (396)	-2,211*** (850)	13 (92)	50 (109)	-529*** (166)	-121* (73)
5.5+ years after (t+6 plus)	-20,759 (13,398)	-49,490*** (17,303)	-1,691 (1,085)	580 (527)	-1,621 (1,017)	32 (96)	-4 (119)	-471* (258)	-208** (84)
Mean (SD)	120,294 (189,652)	248,141 (261,710)	21,467 (16,247)	1,757 (5,146)	13,353 (14,270)	1,513 (1,100)	1,136 (1,210)	2,878 (3,419)	830.8 (864.9)
Observations	9,924	9,924	9,924	9,924	9,924	9,924	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245	2,245	2,245	2,245	2,245	2,245	2,245

Note: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 5. The Probability of A Displaced Family's Living in a Different, Low-Priced House Compared to t-4

	(1)	(2)	(3)	(4)	(5)
	1:Live in a different, lower-priced house at t-2, compared to t-4	1:Live in a different, lower-priced house at t, compared to t-4	1:Live in a different, lower-priced house at t+2, compared to t-4	1:Live in a different, lower-priced house at t+4, compared to t-4	1:Live in a different, lower-priced house at t+6, compared to t-4
Job Displacement					
Job Displacement Occurred at t	-0.022 (0.018)	0.025 (0.029)	0.029 (0.042)	0.116** (0.057)	0.207** (0.086)
Observations	8,774	6,917	5,236	3,893	2,821
Number of Families	2,241	1,972	1,647	1,353	1,116

Note 1: Appendix Table 5 is based on Appendix Table 6.

Note 2: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 6. The Probability of A Displaced Family's Living in a Different, Low-Priced House

	(1)	(2)	(3)	(4)	(5)
	1:Live in a different, lower-priced house compared to 2 years ago	1:Live in a different, lower-priced house compared to 4 years ago	1:Live in a different, lower-priced house compared to 6 years ago	1:Live in a different, lower-priced house compared to 8 years ago	1:Live in a different, lower-priced house compared to 10 years ago
Job Displacement					
2 - 2.5 years before (t-2)	-0.022 (0.018)	0.005 (0.028)	-0.004 (0.033)	0.049 (0.041)	0.110* (0.059)
Current year - 0.5 year before (t)	-0.008 (0.019)	0.025 (0.029)	0.034 (0.037)	0.069 (0.049)	0.109* (0.060)
1.5 - 2 years after (t+2)	0.010 (0.022)	0.035 (0.036)	0.029 (0.042)	0.125** (0.055)	0.162** (0.074)
3.5 - 4 years after (t+4)	0.008 (0.025)	0.029 (0.038)	0.060 (0.049)	0.116** (0.057)	0.197** (0.079)
5.5+ years after (t+6 plus)	-0.003 (0.025)	0.046 (0.045)	0.056 (0.062)	0.114 (0.071)	0.207** (0.086)
Observations	8,774	6,917	5,236	3,893	2,821
Number of Families	2,241	1,972	1,647	1,353	1,116

Note: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 7. The Probability of A Displaced Family's Living a Different, Higher-Priced House, Compared to t-4

	(1) 1:Live in a different, higher-priced house at t-2, compared to t-4	(2) 1:Live in a different, higher-priced house at t, compared to t-4	(3) 1:Live in a different, higher-priced house at t+2, compared to t-4	(4) 1:Live in a different, higher-priced house at t+4, compared to t-4	(5) 1:Live in a different, higher-priced house at t+6, compared to t-4
Job Displacement					
Job displacement Occurred at t	-0.007 (0.028)	-0.084** (0.041)	-0.088 (0.062)	-0.124 (0.097)	-0.289** (0.129)
Observations	8,774	6,917	5,236	3,893	2,821
Number of Families	2,241	1,972	1,647	1,353	1,116

Note1: Appendix Table 7 is based on Appendix Table 8.

Note2: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 8. The Probability of A Displaced Family's Living a Different, Higher-Priced House

	(1) 1:Live in a different, higher- priced house compared to 2 years ago	(2) 1:Live in a different, higher- priced house compared to 4 years ago	(3) 1:Live in a different, higher- priced house compared to 6 years ago	(4) 1:Live in a different, higher- priced house compared to 8 years ago	(5) 1:Live in a different, higher- priced house compared to 10 years ago
2 - 2.5 years before (t-2)	-0.007 (0.028)	-0.052 (0.040)	-0.019 (0.047)	-0.053 (0.067)	-0.072 (0.089)
Current year - 0.5 year before (t)	-0.037 (0.023)	-0.084** (0.041)	-0.126** (0.056)	-0.131* (0.073)	-0.182* (0.095)
1.5 - 2 years after (t+2)	-0.021 (0.027)	-0.091** (0.045)	-0.088 (0.062)	-0.190** (0.085)	-0.197* (0.103)
3.5 - 4 years after (t+4)	-0.003 (0.035)	-0.026 (0.055)	-0.083 (0.077)	-0.124 (0.097)	-0.251** (0.121)
5.5+ years after (t+6 plus)	0.020 (0.031)	-0.019 (0.058)	-0.052 (0.085)	-0.151 (0.109)	-0.289** (0.129)
Observations	8,774	6,917	5,236	3,893	2,821
Number of Families	2,241	1,972	1,647	1,353	1,116

Note: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 9. The Effects of Husband's Job Displacement on Sub-components of Family Income in 2013\$ Terms

	(1)	(2)	(3)	(4)	(5)	(6)
	Husband's	Wife's	Public	Private	Other	Total
	Earnings	Earnings	Transfer	Transfer	Family Income	Family Income
2 - 2.5 years before (t-2)	-13,340*** (3,962)	-590 (1,799)	-1 (414)	-707 (627)	-2,322 (1,592)	-16,959*** (4,886)
Current year - 0.5 year before (t)	-17,385*** (6,024)	-1,695 (1,989)	2,099*** (574)	-535 (918)	-681 (1,691)	-18,197*** (6,931)
1.5 - 2 years after (t+2)	-29,475*** (5,786)	-3,027 (1,929)	797 (518)	-593 (789)	-2,899* (1,594)	-35,198*** (6,630)
3.5 - 4 years after (t+4)	-27,761*** (6,885)	-2,992 (2,399)	1,066** (540)	-935 (884)	-2,250 (1,694)	-32,872*** (7,967)
5.5+ years after (t+6 plus)	-28,863*** (9,591)	-4,582 (2,909)	1,238** (588)	-1,087 (1,071)	-1,812 (2,129)	-35,105*** (10,561)
Mean (SD)	83,777 (146,838)	31,584 (36,065)	1,260 (4,517)	2,894 (15,738)	9,629 (40,404)	129,144 (170,737)
Observations	9,924	9,924	9,924	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245	2,245	2,245	2,245

Note: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix Table 10. The Effects of the Great Recession and Multiple Job Losses on Total Family Expenditures of Displaced Husbands

Dummy Variables	(1) Log Total Expenditures	(2) Log Total Expenditures	(3) Log Total Expenditures	(4) Log Total Expenditures
1st Job Displacement				
2 - 2.5 years before 1st JD (t-2)	0.014 (0.022)	0.013 (0.022)	0.012 (0.022)	0.012 (0.022)
Current year of 0.5 year before 1st JD (t)	-0.023 (0.028)	-0.023 (0.028)	-0.025 (0.028)	-0.025 (0.028)
1.5 - 2 years after 1st JD (t+2)	-0.049* (0.028)	-0.061* (0.031)	-0.043 (0.028)	-0.056* (0.031)
3.5 - 4 years after 1st JD (t+4)	-0.087** (0.034)	-0.066* (0.036)	-0.075** (0.035)	-0.054 (0.037)
5.5+ years after 1st JD (t+6 plus)	-0.089** (0.036)	-0.086** (0.038)	-0.067* (0.038)	-0.066* (0.040)
The Great Recession (GR)				
GR in 1.5 - 2 years after 1st JD		0.033 (0.037)		0.037 (0.038)
GR in 3.5 - 4 years after 1st JD		-0.071 (0.049)		-0.070 (0.048)
GR in 5.5 + years after 1st JD		-0.010 (0.025)		-0.005 (0.024)
Multiple Job Losses				
Current year of - 0.5 year before 2nd/3rd JD			-0.063** (0.030)	-0.064** (0.030)
1.5 - 2 years after 2nd/3rd JD			-0.046 (0.045)	-0.048 (0.044)
3.5 - 4 years after 2nd/3rd JD			-0.039 (0.038)	-0.040 (0.038)
5.5+ years after 2nd/3rd JD			-0.097* (0.054)	-0.095* (0.054)
Observations	9,924	9,924	9,924	9,924
Number of Families	2,245	2,245	2,245	2,245

Note: Robust standard errors are presented in parentheses (***) p<0.01, ** p<0.05, * p<0.1).

Appendix A. Constructing the Variables for Annual Family Expenditures

Most of the questions related to annual family income in the PSID have referred to the previous year of each survey year. But the time frames of questions related to expenditures are varied across expenditure categories; for some expenditures such as for health care and education, for example, the PSID has asked about the amount of expenditures during the two years prior to the interview year, while for many other expenditures related to food, housing, etc, it has referred the previous month or just an unspecified recent period around the interview month, which was mostly between March and May for each interview year. There are also some expenditure categories, such as for car-purchase and lease, which refer to the whole period from two years before the interview year through the interview month. Thus, in general, the time frame of annualized expenditures in the PSID would match that of the annual income, with some errors. More specific methods that I use to construct annualized expenditure amounts for each expenditure category are as follows:

Food Expenditures: The annual food expenditures in this study include food-at-home, food delivery, food-away-from-home, and food stamps. Specifically, I use the following questions in the 1999-2013 PSID to calculate annualized family expenditures for food-at-home, food delivery, and food-away-from-home: “How much do you (and everyone else in your family) spend on food that you use at home in an average week?”, “How much do you spend on that food delivered to the door?”, “How much do you (and everyone else in your family) spend eating out?”. As for food stamps, there are two different questions in the 1999-2013 PSID, “How much did you receive in food stamp benefits in the previous year?” and “How much did you receive in food stamp benefits last month?” It turns out both measures for food stamps generate comparable regression results in this paper, although I choose to use the former one because my primary

purpose is to proxy the annual expenditures for the year prior to each interview year as much as possible to more correctly match the time frame of annual income information in the PSID.

Housing Expenditures: The annual housing expenditures consist of rent/mortgage payments, home utility expenses for electricity and heating, home insurance premiums, and property tax. Specifically, annualized payments for rent and mortgage are calculated based on the following questions, “About how much rent do you pay a month?” and “How much are your monthly mortgage payments?”, respectively. Home utility expenditures for electricity and heating refer to the questions, “How much do you (and your family living there) usually pay for electricity per month on average?” and “how much do you (and your family living there) usually pay for gas or other types of heating fuel per month on average?” Lastly, the home insurance premium was calculated from the question “How much is your total yearly homeowner's insurance premium?”, and property tax from the question “About how much are your total yearly property taxes, including city, county, and school taxes?”

Transportation Expenditures: The annual transportation expenditures encompasses the expenses for purchasing/leasing car(s), car-operation costs such as car insurance, car repair, fueling, and parking/pulling, and the expenses for using public transportation such as buses, trains, taxi.

Specifically, the 1999-2013 PSID has asked about detailed expenditures for up to three cars which had been newly purchased or leased since the January two years before each interview year. For example, the questions for newly-purchased car(s) cover total purchase price, trade-in dollar amounts if any, and down/loan payments if any. Using those questions, I calculate average annual expenses for each car newly purchased since January two years before the interview year. Similarly, the questions for newly-leased car(s) cover the dollar amount of initial outlay and

lease payments; using those questions, I also calculate average annual expenses for each car newly leased since January two years before the interview year. The 1999-2013 PSID also asked about additional purchase/lease expenditures for additional cars which are not covered by the questions above. Combining all this information, I proxy average annual dollar amounts that a family has paid for buying/leasing car(s) for the last two years of the interview year.

I obtain the information on annual car insurance premium from the following question: “How much do you (and your family living there) pay for car insurance for (all of) your vehicle(s) per year?” In turn, to calculate other annualized car-operation costs such as for car repair/gasoline/car parking and pooling, I refer to the following question: “In [LAST MONTH], how much did (you/your family living there) pay for each of these transportation related expenses [a. Car repairs or maintenance b. Gasoline, c. Parking and car pooling]?” Similarly, to construct annualized public transportation costs for bus, train, taxi, etc, I refer to the following question: “In [LAST MONTH], how much did (you/your family living there) pay for each of these transportation related expenses [a. Bus fares and train fares b. Taxicabs c. Other transportation costs]?”

Health Care Expenditures: The annual family expenditures for health care include the expenses for doctor appointments, surgery, dental treatment, nursing care, hospitalization, prescription medicine and health insurance. Each component of them is calculated based on the following questions respectively: “About how much did you pay out-of-pocket for doctors, outpatient surgery, dental bills in the last two years combined?”; “About how much did you pay out-of-pocket for nursing home and hospital bills in the last two years combined?”; “About how much did you pay out-of-pocket for prescriptions, in-home medical care, special facilities, and other services in 1997 and 1998 combined?”; “Altogether, how much did [you/your family] pay

for health insurance premiums, in the last two years combined, for (all of) the health insurance or health care coverage(s) you just mentioned? Please include amounts that you had automatically deducted from your pay, as well as amounts you paid directly.”

Education Expenditures: The annual family expenditures for education consist of school-related costs and child care costs. Each component of them refers to the following questions, respectively: “In the last year, how much in total were these expenses such as [a. Purchase or rental of books, supplies, uniforms, or equipment including computers and software; b. Tuition or tutoring (not including any amounts already mentioned for day care or nursery school); c. Room and board for a family member who is away at school]?”; “In the last year, were there any other school-related expenses not already covered in the previous question?”; “How much did you (and your family living there) pay for child care last year?”