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## Job loss and depression: The role of subjective expectations

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### Abstract

Although the importance of expectations is well documented in the decision-making literature, a key shortcoming of the empirical research into effects of involuntary job loss on depression is perhaps its neglect of the subjective expectations of job loss. Using data from the US Health and Retirement Study surveys we examine whether the impact of job loss on mental health is influenced by an individual's subjective expectations regarding future displacement. Our results imply that, among older workers in the age range of 55–65 year, subjective expectations are as significant predictors of depression as job loss itself, and ignoring them can bias the estimate of the impact of job loss on mental health.

### Keywords

Job loss; Mental health; Subjective expectations; Panel data; USA

### Introduction

The issue of unemployment and its relationship to mental health status is of increasing importance as employment and associated health care benefits become increasingly volatile. To date, the vast majority of research on unemployment has focused on the relationship between changes in labor market status (e.g., the transition from employment to unemployment, and vice-versa) and economic behavior or well-being. However, much less attention has been given to the impact of job insecurity in this context. The specter of unemployment looms large for many workers in the current economic crisis. It is therefore likely that individuals who remain employed experience anxiety and fear about losing their jobs. To our knowledge, comparison of the effects of expectation of future job loss and actual job loss on mental health has not been studied. Using the Health and Retirement Study, which surveys older Americans, we provide evidence that job loss expectation is as influential as its realization in determining psychological well-being. The policy implication of our finding is that the total economic impact of rising unemployment could be much higher than previously considered.

The recent collapse of equities and housing markets has occasioned an extraordinary loss of employment in the U.S. In both production and service sectors of the economy, job losses have been almost unprecedented. Over 1.9 million jobs were lost in the last four months of 2008 after the failure of financial institutions and near closing of U.S. auto makers.

Employment losses persist even as federal programs to spur job creation are currently being implemented. Since February 2009, the number of unemployed individuals has increased by nearly three million, its highest level in decades (Bureau of Labor Statistics). Job displacement is not new to the U.S. economy. It is estimated that from the late 1970s to 1995 43 million jobs were permanently eliminated (Hamermesh, 1989; Kletzer, 1998; Smith, 1997). Then, more than 5.3 million workers, 4% of the total work force, were displaced between 2001 and 2003 (Schmitt, 2004), prior to a period of robust economic growth that ended in late 2007. Older workers have fared unfavorably in the more prominent culture of job loss, likely owing to both worker attributes (e.g., specificity of human capital, high reservation wages), and employer preferences (e.g., age-biased hiring practices). Previous research has indicated large increases in 3-year job loss probabilities for workers 55–64 year (Farber, 1997), and poor prospects for reemployment, particularly as workers advance toward 65 year. One study finds that while displaced workers in their fifties have a roughly 75% chance of becoming reemployed within two years after job loss, a 62-year-old job loser's chances are less than one third (Chan & Stevens, 2001). Moreover, research has consistently suggested that older workers' earnings losses, upon reemployment, are higher than those of younger workers (Couch, 1998; Stevens, 1997). Thus, involuntary job loss can also seriously attenuate the retirement plans of older individuals if it is followed by a long spell of unemployment.

The financial and psychosocial burdens of late-career job losers are numerous and varied (Robb, Haley, Becker, Polivka, & Chwa, 2003; Siegel, Bradley, Gallo, & Kasl, 2004; Theodossiou, 1998). That such an economic exposure as job loss may influence health is therefore quite plausible. Unemployment causes financial instability, reduces social interaction and one's sense of fulfillment, and increases unstructured time, all of which are stressful. Indeed, evidence from studies of the mental health effects of job loss among older workers is compelling. Using longitudinal data, Gallo, Bradley, Siegel, and Kasl (2000) examine changes in depressive symptoms relative to the continuously employed, reporting significant increases among job losers up to 2 year after separation. A strong argument for causality in this relationship is suggested by the subsequent findings of Mandal and Roe (2008). The authors both replicate the previous findings, applying a more sophisticated econometric approach to account for selection bias, and provide additional evidence that mental health declines were reversed by reemployment. Research by Gallo et al. (2006) also indicates mental health scarring in older workers who are less capable of financially sustaining their households during an extended period of unemployment. This follow-up investigation to the 2000 study revealed that the initial, 2-year effect of job loss on depressive symptoms persisted at 4-year and 6-year follow-up among displaced workers with low net worth before separation, even after accounting for the influence of subsequent employment transitions. Familial spill-over effects of job loss in the same cohort (Siegel, Bradley, Gallo, & Kasl, 2003) have also been reported, where wives of displaced workers in certain net worth strata had elevated depressive symptoms after husbands' job losses. A study by Salm (2009), also using the data from the Health and Retirement Study, finds no effect of job loss on various measures of health, including change in depression score. The author uses a linear differences-in-differences model to estimate the impact of job loss due to business closure. Our study extends this approach by accounting for unobserved heterogeneity via random effects. We also add to the literature by including more recent data on job losses from the HRS and analyzing the impact of job loss separately for younger and older workers.

Since Easterlin's (1974) research on economic growth and happiness, data on subjective well-being have been increasingly used in economics to answer both micro- and macro-oriented questions (Kahneman & Krueger, 2006). Using proxy utility data, Clark (2003) tests theories of social norms and social comparisons in relation to labor market status at the

regional, couple, and household level. He finds that while others' unemployment negatively affects the well-being of those in work force, it actually positively affects the well-being of those unemployed; as a result, unemployment hurts less when there are more unemployed individuals. In terms of welfare analysis, his results imply that those who remain unemployed after a fall in unemployment suffer reduced well-being. In a subsequent article, Clark, Knabe, and Rätzel (2010) provide evidence of an association between others' unemployment and one's own job insecurity. Using data from a long-run German panel, he finds that both the employed and the unemployed are strongly negatively affected by regional unemployment rate. Previous research on the macroeconomics of happiness has also shown that individual well-being is related to aggregate macroeconomic variables such as the unemployment rate, inflation and the interest rate (Blanchflower, 2007; Di Tella, MacCulloch, & Oswald, 2001). In their narrative on happiness research, Frey and Stutzer (2002) also state that involuntary unemployment has been found to strongly reduce individual, as well as societal, subjective well-being.

However, the economic literature that combines depressive symptomatology with unemployment expectations is less developed. Our goal is to present evidence that mental health status is a function of not only labor market transitions but also of job loss expectations among workers nearing retirement. In the next section we discuss our data in detail and explain how the definitions of 'mental health status' used in this article and 'well-being' used in literature are quite similar. We also analyze the effect of reemployment within a short duration after job loss on the mental health of individuals in this particular age group. While the primary means of accomplishing this goal is to incorporate subjective job loss expectations in the regression of depression on labor market changes, we make two further improvements. First, we use business closings to proxy job loss. Business closings are an exogenous measure of displacement that, because of issues related to statistical power, has seldom been applied to previous analyses of the survey data under consideration. And second, using panel data econometric techniques, we establish that the estimates of interest are not biased by unobserved individual heterogeneity.

The subjective expectation of losing a job may affect subsequent depressive symptoms via two related theoretical pathways. The first of these is the direct impact of the expectations on the after-effects of a realized job loss. Individuals who view job loss as imminent may be less seriously affected by the ultimate separation than those for whom job loss appears a remote possibility. In fact, it is conceivable that workers with a higher expected likelihood of job loss may experience depression in anticipation of the event, rather than after displacement. As such, post-displacement changes in depression are bounded (i.e., upper truncated) due to increased depression resulting from the job insecurity prior to separation. Thus, if subjective expectations are also predictive of actual job loss then omitting them from the analysis would bias the impact of job loss on depression (Stephens, 2004). The second behavioral pathway, which represents greater complexity, is even more underrepresented in the extant literature. If job loss is anticipated, then individuals may modify their economic behavior, which could diminish the effect of an actual job loss on later depression. More specifically, one of the theorized causal mechanisms from displacement to depression is financial deprivation, which originates primarily from the loss of income and non-cash benefits associated with unemployment (Kasl & Jones, 2000). Hence, if workers who expect to be displaced alter their wealth accrual, increase their liquidity, decrease their consumption, or adjust their employment-seeking behavior (e.g., begin to search earlier, lower their reservation wages, etc.), they will presumably ease the post-displacement deprivation that triggers the depression effect. It should be noted that Stephens (2004) finds that although job loss expectations are significant predictors of job losses and are subsequently correlated with expected changes in future earnings, they do not

influence household consumption decisions. The author suggests that this could be due to loss aversion over future consumption changes.

## Data

### Source and description

The data are taken from the US Health and Retirement Study (HRS), a panel survey conducted by the Institute for Social Research at the University of Michigan that was begun in 1992 (Survey Research Center, 2009). Follow-up data are collected from participants every two years. The HRS is a nationally representative sample of individuals born between 1931 and 1941 and their spouses regardless of age. In the first year of the HRS 12,652 individuals from 7702 households were surveyed in face-to-face interviews. The surveys, one of whose aims is to explore trajectories of well-being associated with the transition to retirement, contain extensive information on a variety of topics such as demographics, employment, health and household finances. The HRS surveys also include questions concerning respondents' expectations of various life events, including job loss. Our study uses data from both the original HRS surveys (1992–2006) and Version H (2008) of the data prepared by RAND. The RAND HRS Data file is a longitudinal database that includes the most frequently used HRS variables. It was developed at RAND with funding from the National Institute on Aging and the Social Security Administration. Details on the RAND version of the HRS may be found at the RAND Corporation website (“RAND HRS Data, Version H,” 2008).

To isolate individuals who were at risk of job loss at the time of survey, the initial sample is restricted to HRS participants who met the following criteria at the 1992 baseline: (1) were between ages 45 and 65 year; (2) were working for pay; (3) reported a minimum of two years of continuous employment with the 1992 employer; and (4) provided outcome data in at least one follow-up survey. The baseline application of the tenure criterion circumscribes undesirable sample heterogeneity deriving from the inclusion of seasonal workers and those with weak labor force attachment. Such a screen has been used in previous studies of job displacement (Couch, 1998; Jacobson, LaLonde, & Sullivan, 1993). Next, we construct up to seven two-wave (i.e., wave 1–wave 2...wave 7–wave 8) person-spell records. We limit the sample to study subjects who reported involuntary job loss or continuous employment so that the mental health effects of displacement are assessed in relation to those associated with uninterrupted work. We exclude individuals who stopped working for reasons other than unemployment. The surveys do not directly ask the respondents whether they have suffered an involuntary job loss. Rather, in each wave participants are asked if they continued to work for the previous wave's employer, and if not the reason for leaving the employer. If an individual reported business closure or layoff, we code it as an involuntary displacement. However, job loss, particularly layoffs, might be endogenous to health, since individuals with mental health problems might be more likely to be laid-off when a firm is downsizing. To circumvent this endogeneity issue we focus on only those individuals who suffered an involuntary job loss due to business closure.

At the baseline, there are 6781 individuals who were working for pay, within the age range of 45–65 year, and had reported a minimum of two years of continuous employment with the 1992 employer. The numbers of individuals who lost their jobs due to business shutdown were 153, 114, 146, 65, 95, 56 and 44 in the intervals preceding the 1994, 1996, 1998, 2000, 2002, 2004 and 2006 surveys respectively. Individuals who suffered multiple job losses were included as long as they also reported working for an employer for at least two consecutive years in between the losses.

## Variables of interest

The measure of depression is based on an 8-item abbreviated form of the 20-item Center for Epidemiological Studies-Depression (CES-D) battery (Radloff, 1977). Originally, there were 20 items in this scale. But HRS only includes 8 of them in its surveys. Mandal and Roe (2008) show that the 8-item CES-D measure is both reliable and valid. The CES-D scale (both full and shorter versions) is commonly used to measure distress and psychological well-being in both economics and psychology literatures. Of the eight items, six negatively phrased statements reflect the presence of depressive symptoms (respondent felt depressed; felt everything s/he did was an effort; experienced restless sleep; could not get going; felt lonely; felt sad), and two positively phrased statements suggest the absence of depressive symptoms (respondent enjoyed life; was happy). The two positively phrased statements are reversed and all 8 items are added to obtain a single count of total number of depressive symptoms. This measure is called the CES-D score, and a higher value of the CES-D score represents worse mental health. The happiness literature views happiness scores as appropriate measure of true internal utility with some noise, and although it is still not clear whether such scores refer to current or delayed utilities, the signal-to-noise ratio in the available data is considered to be sufficiently high to make it empirically useful (Di Tella & MacCulloch, 2006). In most happiness studies, the subjective self-reported happiness is equivalent to our second positive indicator. Alternatively, life-satisfaction (a 4-point scale ranging from very satisfied to not at all satisfied with life) may proxy well-being (Di Tella et al., 2001). Luttmer (2005) uses measures of well-being like the incidence of depression, poor appetite and poor sleep that are less likely to be purely subjective and finds similar associations between earnings and well-being as those obtained using standard subjective happiness data by Clark (2003).

The subjective expectation of job loss is based on responses to the following question, asked of all employed participants:

Sometimes people are permanently laid-off from jobs that they want to keep. On the scale from 0 to 100 where 0 equals absolutely no chance and 100 equals absolutely certain, how likely is it that you will lose your job during the next year?

In the first wave of the HRS, the response scale for the subjective expectations of job loss ranged from 0 to 10, with 1-point increments; in all later waves, the range was 0–100, with 10-point increments. Nevertheless, the wording of the question did not vary across survey waves. To create comparable measures across waves, we divide the wave 1 responses by 10 and responses from all other waves by 100, creating probability measures that range between 0 and 1. Job loss realization, on the other hand, is a binary variable, with 0 indicating absence of the event and 1 implying occurrence of the event.

The distribution of job loss expectation is presented in Fig. 1. The top half shows the distribution for those who actually suffer job loss in the next period, while the bottom half shows the same for those who continue to remain employed. In both samples, subjective expectation of job loss is concentrated between 0 and 0.1, and again at the opposite extreme. Almost 10% of the sample suffered job displacement. Accounting for the declining prevalence of work in this sample of older workers, this value is consistent with what has previously been reported in this time period. Notably, the figure reflects that a sizable proportion of our sample who offered a rather high expectation of job loss was not eventually displaced. About 17% of the respondents who did not lose their job due to business shutdown reported more than a 50% chance of losing their jobs, including 2% of respondents who were quite certain that they would lose their jobs in the subsequent year. Previous studies have shown that while there is a strong correlation between job insecurity and subsequent job loss, there is a substantial fraction of workers that overestimate the probability of job loss (see for example, Green, Dickerson, Carruth, & Campbell, 2001;

Stephens, 2004). Descriptive statistics are presented in Table 1. Demographic variables and characteristics of most recent or current job are used as covariates. We also control for macroeconomic conditions through the use of the annual real returns on the S&P 500 Index.

## Estimation procedure

We estimate the impact of job loss on the CES-D measure using random effects models. The basic regression model is of the form:

$$\Delta Y_{it} = \beta \Delta X_{it} + \delta W_{it-1} + \gamma Z_i + \varepsilon_{it} \quad (1)$$

where, the dependent variable,  $\Delta Y_{it}$ , measures the change in CES-D score between successive waves;  $\Delta X_{it}$  denotes the change in time-varying exogenous variables — whether suffered job displacement due to business closure, change in marital status, and change in non-housing assets;  $W_{it-1}$  are the lagged time-varying characteristics — subjective job loss expectation, interaction between displacement and expectation, type of occupation, tenure at current or most recent job, and macroeconomic condition;  $Z_i$  includes the time-invariant demographic characteristics — age at baseline, gender, race, and the highest level of education attained; and,  $\varepsilon_{it}$  is the random disturbance consisting of two components — omitted variables peculiar to individuals and omitted variables peculiar to both individuals and time periods for which observations are obtained. A fundamental empirical challenge in isolating the effect of job loss on mental health is that the omitted individual-specific variables could be correlated with the observed factors, inducing unobserved heterogeneity and distorting the magnitude of the effects of employment status and job loss expectation. To ensure that the omitted variables are indeed random we use the Hausman—Taylor specification test, which compares the estimates of the fixed effects and random effects models. A large chi-square test statistic implies that the random effects model produces biased and inconsistent estimates, while a small statistic implies that both models produce unbiased and consistent estimates. However, the random effects model is more efficient as it allows for time-invariant independent variables.

Preliminary analysis showed that it is important to analyze 45–54 year (baseline age) old individuals separately from 55 to 65 year old individuals. The relationship between age, job loss expectations and macroeconomic conditions is complex. Full information for multivariate analysis is available for 3000 older cohort members and 2994 younger members. 312 or 10% of the older individuals suffered displacement between 1992 and 2006, while 361 or 12% of the younger individuals reported job loss due to business closure. The younger respondents, on average, assigned a slightly higher likelihood of job displacement (0.162) to themselves compared to the older members (0.147). Yet, the correlation between job loss expectation and change in mental health was insignificant ( $p$ -value = 0.75) in the younger cohort, and significant in the older cohort ( $p$ -value = 0.02). Interestingly, we observed that the mental health of both cohorts, on an average, was less likely to be affected by subjective expectations over time. This could be due to aging, closeness to retirement, macroeconomic fluctuations, or any combination of the three. All of these factors could impact both cohorts, but are difficult to separate. In Fig. 2 we present the relationship between job loss expectation and change in CES-D score. A higher positive CES-D score implies worsening of mental health. We observe that an increase in the number of depressive symptoms was related to increasing pessimism regarding own employment status in both cohorts, yet more so among the older members. In Fig. 3 we plot the average job loss expectation of the two cohorts over time. We note that although younger cohort members had higher starting probabilities of job loss, the expectations of both cohorts gradually merged over the surveys.

## Results

Estimated coefficients and standard errors of the random effects model for the younger and older cohorts are presented in Table 2. According to this model the estimated negative effect of job insecurity on mental health is significant for the older cohort members and insignificant for the younger respondents. The effect of a job loss itself is significant in both cohorts, and is higher in magnitude in the younger cohort. However, the interaction term is not significant, indicating that the impact of job loss expectations on mental health does not vary by the exogenous labor market changes. Lower level of education is associated with greater deterioration of mental health. Getting married improves mental health, while separation has a negative effect in both cohorts. Among the younger cohort, we noted that individuals from farming, fishing, mechanical and service sectors displayed a slightly higher increase in depressive symptoms than those in other occupations. No differential effect across occupation types was observed among the older cohort members. These results are consistent with a large literature that finds a negative impact of job insecurity on mental health. For example, see Heaney, Israel, and House (1994) for the impact of chronic job insecurity on job satisfaction. A direct comparison of our estimates with previous literature is not possible as existing studies vary substantially in the measure of job insecurity used. For example, Campbell, Carruth, Dickerson, and Green (2001), Green et al. (2001), and Green, Felstead, and Burchell (2000) use self-reported measures of job insecurity based on 4 or 5 point Likert scales; Nickell, Jones, and Quintini (2002) use the predicted probability of unemployment while Heaney et al. (1994) use a five item index of job insecurity.

Next, we consider the situation where some individuals were successful at finding reemployment within a short period of time. In our sample, 38% of the displaced individuals from the younger cohort and 58% from the older cohort were able to find another job before the next survey (most within a few months), while the rest remained unemployed. The CES-D scores of the younger group of individuals might potentially reflect a combined impact of contrasting events, while the CES-D scores of the older group of individuals might reflect the prolonged effect of persistent unemployment. To investigate this, we reconstruct the random effects models as before, but now with three categories of displacement — none (comparison category), job loss with reemployment before next survey, and job loss with continued unemployment. The results are shown in Table 3. From this model, it is clear that among the younger cohort, the worsening of mental health among those who suffered displacement was primarily driven by those who were unsuccessful at finding a new job in a short period of time. There was no significant difference in mental health change between those who were not displaced and those who were displaced but found reemployment in a relatively short time. Again, the effect of lagged subjective expectation on change in mental health is not significant in this cohort. On the other hand, among members of the older cohort, it was the job insecurity that increased the number of depressive symptoms, and not displacement itself. In these age cohorts, many who remain unemployed for more than one spell decide to retire or move out of labor force. Thus, we do not evaluate the long-run (more than one spell) impact of job displacement on mental health in conjunction with subjective employment prospects.

## Conclusions

Previous studies on the association between job loss and depression in older workers have failed to account for participants' subjective employment expectations, an empirically relevant element of the job loss experience that we hypothesize to be directly related to subsequent depression, and to be potentially part of the causal chain of economic behaviors by which an actualized job loss affects depression. In this study, we explicitly model the subjective expectations of job loss, alongside and in conjunction with, actualized job loss

events. Moreover, by restricting our analysis to job loss caused by business closures, we are able to circumvent endogeneity of job loss to mental health.

From the raw data, we find that those who have higher expectation of job loss (probability 0.5) exhibit about twice the increase in the number of depressive symptoms of those with lower expectation. At the same time, those who actually suffer job loss display four times greater increase in depressive symptomatology than those who do not. Our regression results do suggest that expectations are important in studying the mental health effects of job loss among older workers. However, there are differences within age groups. To summarize, we find that higher subjective expectations among older workers (55–65 year) and actualized job losses among relatively younger workers (45–54 year) are statistically associated with elevated depression. To put into perspective the magnitude of mental health impacts from realized and subjective expectation of involuntary job loss, we note that job displacement and likelihood of job displacement result in change in CES-D scores that is respectively half and one-fourth of the magnitude of that associated with spousal separation. However, there is no significant difference in change in CES-D scores between the optimistic group (consisting of those with lower expectation of job loss) and the pessimistic group in the event of a job loss in either age cohort. That the impact of job loss on mental health is neither amplified nor diminished by an individual's subjective expectations regarding future displacement may imply that individuals have some private information regarding the consequences of losing their jobs that is not observable to the researcher. Alternatively, it is possible that individuals simply overestimate the probability of job loss and this bias affects their mental health. While our data do not allow us to distinguish between these two interpretations, our results suggest that ignoring subjective expectations would miss an important determinant of mental health. The likelihood ratio test statistic comparing the models with and without the probability term is highly significant ( $p$ -value < 0.001), implying that subjective expectation is important in modeling depression due to job loss. On dissecting the data further, we find that there is no significant difference in the mental health of those who remain continuously employed and who lose job but are able to gain employment soon. Comparatively, those who remain unemployed for a long duration show a very high degree of depressive symptoms in the younger cohort.

The primary limitation of this study is that, although job loss expectations capture a crucial element of the displacement experience, they cannot realistically represent the entire potential sequence of financial and economic modifications that may abate the mental health effects of later realization. In fact, with observational data from a follow-up period that spans almost two years, it is temporally impossible to model the full causal pathway, especially given a health outcome that is assumed to be contemporaneously affected by job loss. A second limitation of this study is that while random effects account for unobserved heterogeneity, they do not account for reverse causality between mental health and job insecurity. Nevertheless, the finding that expectations are related to subsequent depression does suggest that they should be considered in similar studies. The availability of expectations data provides an opportunity to empirically investigate some of the nuances of decision-making theory with respect to employment pathways. Further research on other psychological, and perhaps physical, manifestations could highlight the role of expectations in explaining economic behaviors. However, it is the policy implication that is of immediate interest. Currently the unemployment rate in the U.S. is 10% with 15.4 million unemployed persons, compared to an unemployment rate of 4.9% with 7.5 million unemployed persons at the start of the recession in December 2007 (Bureau of Labor Statistics, November 2009). More importantly, between November 2008 and November 2009, the number of long-term (27 weeks or more) unemployed persons rose from 2.2 million to 5.9 million and the percentage of unemployed persons jobless for 27 weeks or more increased from 21.9% to 38.3%. In such an economic environment, job loss expectation among the employed and the



prospect of staying unemployed for an unusually long duration could be potentially high, consequently causing substantial distress. Increased resources dedicated to job training and placement for older U.S. workers could reap benefits with regard to reduced private and public mental health expenditures. Such expenditures on mental health issues are non-trivial. Harman, Edlund, and Fortney (2004) found that out-of-pocket expenditures on all forms of health care for seniors with self-diagnosed depression significantly exceeded expenditures for seniors with other common ailments such as hypertension and arthritis. Further research could more clearly assess the degree to which the mental health benefits of employment among older Americans would warrant the expansion of job training and employment programs aimed at this group.

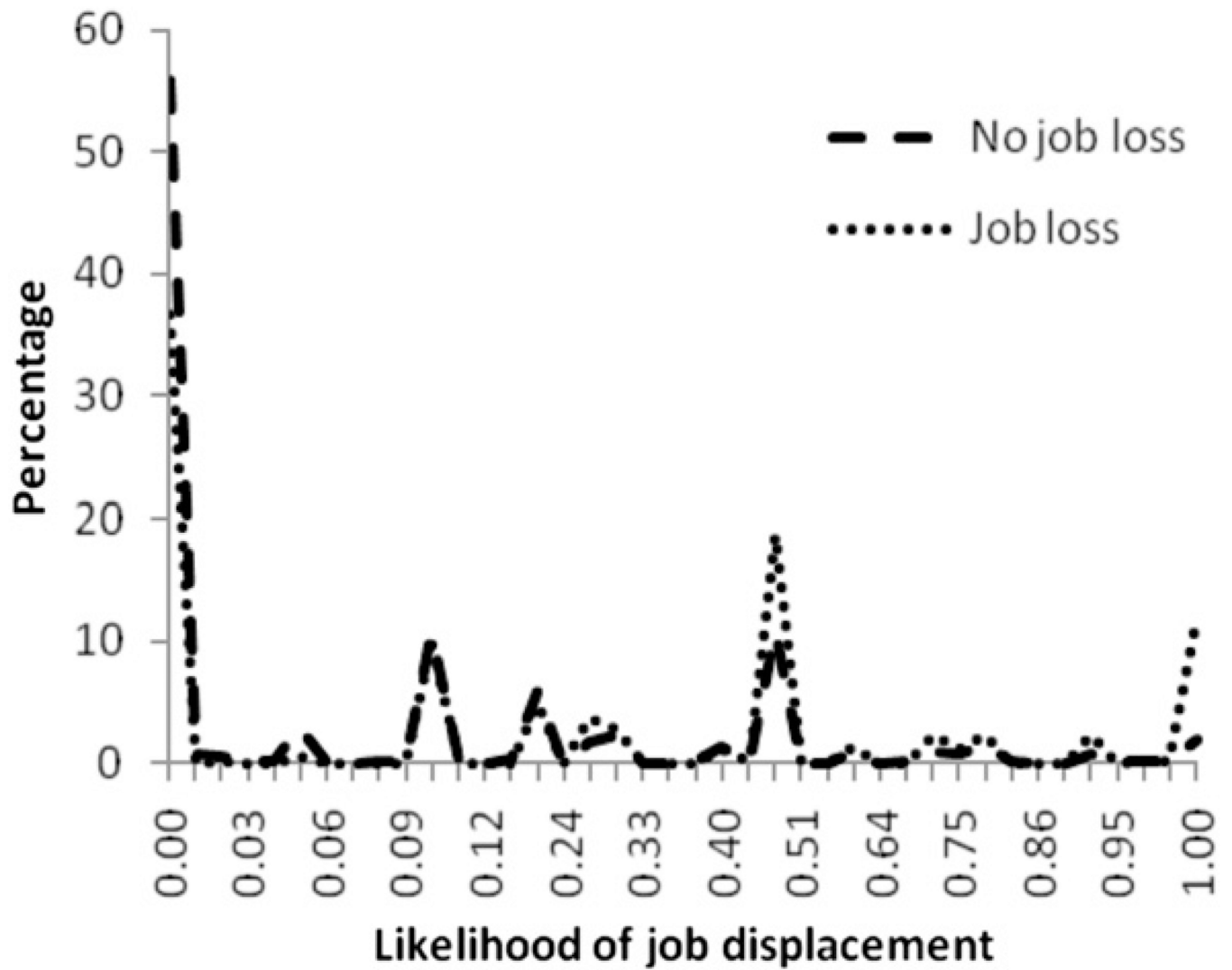
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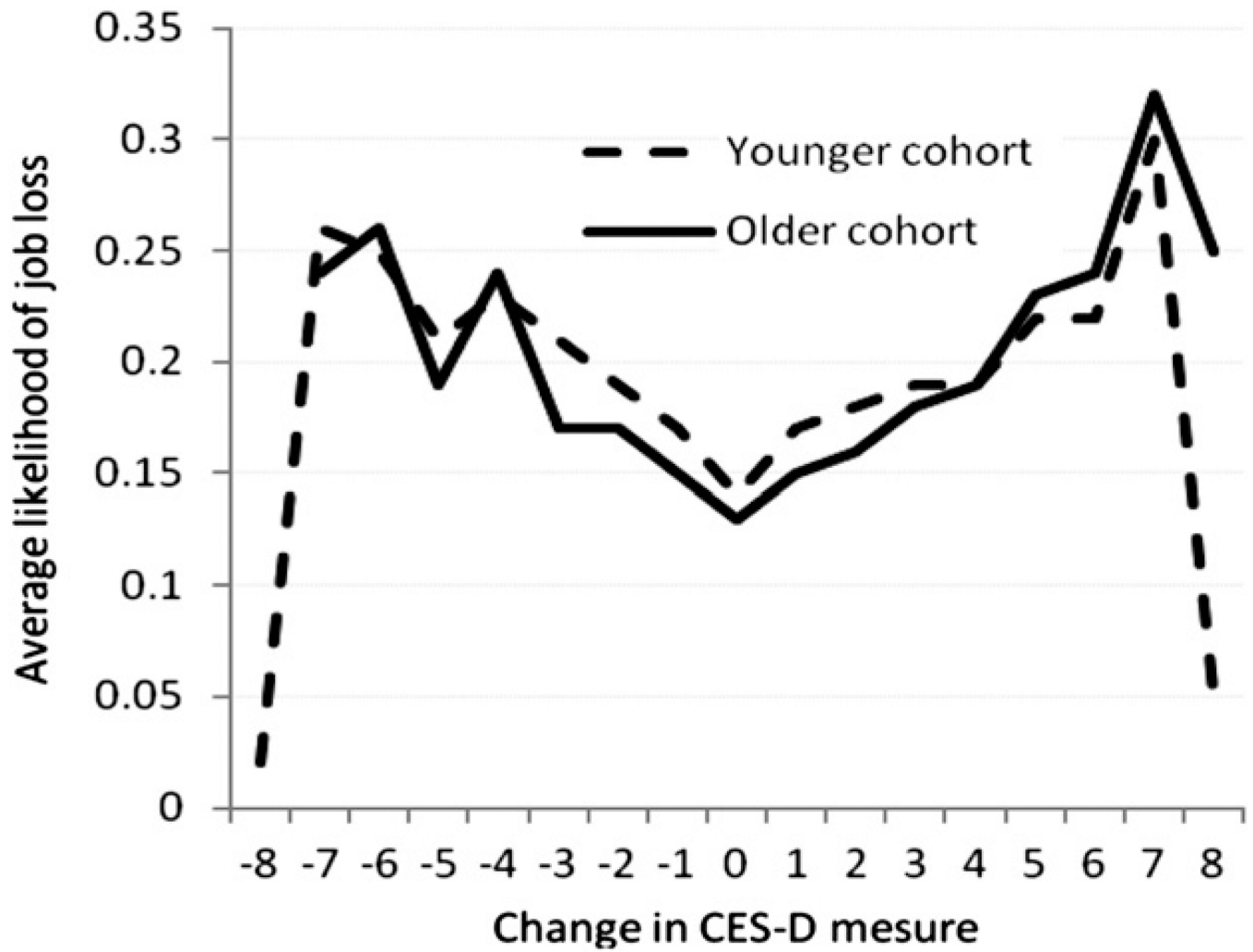
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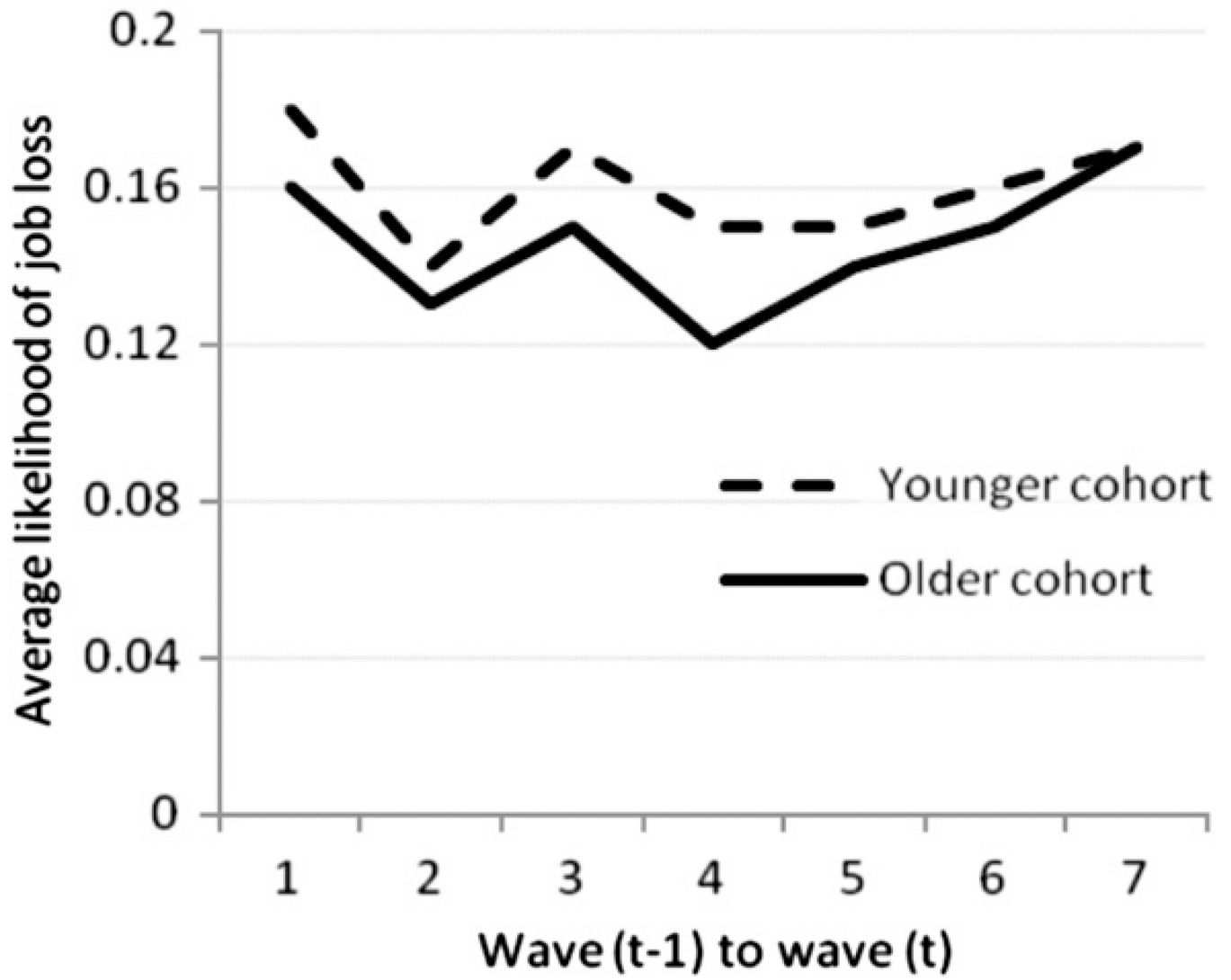
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**Fig. 1.**  
Distribution of likelihood of job displacement by realized displacement.



**Fig. 2.** Average job loss expectation and change in CES-D measure of younger and older cohorts.



**Fig. 3.**  
Pattern of average subjective job loss expectation over time across cohorts.

**Table 1**

Descriptive statistics.

Variable	Definition	Mean (SD) or Frequency
Number of subjects <sup>a</sup>	Number of subjects in the panel data	6781
Number displaced <sup>b</sup>	Number of subjects who suffered job loss	673
CES-D score	Mental health measure, ranging from 0 (best) to 8 (worst)	1.19 (1.76)
Change in CES-D score	Change in mental health between successive waves	0.11 (1.71)
Job loss expectation (lagged)	Subjective probability of job loss, ranging from 0 to 1	0.16 (0.25)
Age at baseline, yrs	Age of subject in year 1992	54.76 (4.11)
Education — <High School, %	Highest level of education is less than High School degree	23.27
Education — High School, %	Highest level of education is attaining High School degree	36.52
Education — Some college, %	Highest level of education is less than college degree	19.94
Education — College or higher, %	Highest level if education is attaining college degree	20.30
Male, %	Subject is male	48.84
Female, %	Subject is female	51.16
White, %	Subject is white	80.09
Non-white, %	Subject is non-white	19.91
Married or partnered	Subject got married or partnered since previous wave	0.81
Divorced, separated or widowed	Subject got divorced, separated or was widowed	2.02
No change in marital status	No change in subject's marital status since previous wave	97.17
Job tenure, yrs (lagged)	Number of years in current or most recent occupation	12.73 (11.16)
Change in wealth, (\$100,000)	Change in non-housing assets since previous wave	0.27 (8.22)
Occupation (lagged):	Occupation type of current or most recent job	
Managerial, %	Managerial, specialty operation	11.17
Professional, %	Professional, technical support	13.40
Sales, %	Sales	6.85
Administrative, %	Clerical, administrative support	14.43
Service, %	Health, food preparation, protection or personal services	13.05
Farming, %	Farming, fishing, forestry	1.75
Mechanical, %	Mechanical, repairs, extractors, precision production	7.28
Operators, %	Machine or transport operators	11.60
Others, %	Others or unknown occupation type	20.47

Note: Sample consists of those individuals who were either employed continuously between consecutive waves or who suffered job loss due to business shutdown.

<sup>a</sup>The number of individuals in the baseline age range of 45–54 year is 3353; and, the number of individuals in the baseline age range of 55–65 year is 3428.

<sup>b</sup>The number of individuals in the baseline age range of 45–54 year who suffered job loss due to business closure is 361; and, the number of individuals in the baseline age range of 55–65 year who suffered job loss is 312 between 2002 and 2006.

**Table 2**

Impact of job loss and expectations on change in CES-D scores coefficients (standard errors) and *p*-values from random effects models.

Variables	Age group			
	45–54 Year		55–65 Year	
	Est. (SE)	<i>p</i> -Value	Est. (SE)	<i>p</i> -Value
Suffered business closure	0.329 (0.135)	0.015	0.246 (0.129)	0.056
Job loss expectation (lagged)	–0.036 (0.065)	0.579	0.154 (0.070)	0.029
Displaced × expectation (lagged)	–0.001 (0.003)	0.751	–0.005 (0.004)	0.176
Age at baseline	0.008 (0.007)	0.278	0.005 (0.007)	0.496
Female	0.057 (0.038)	0.132	0.030 (0.039)	0.433
Non-white	0.028 (0.042)	0.498	0.001 (0.046)	0.975
Highest level of education				
Less than high school	0.125 (0.063)	0.047	0.215 (0.062)	0.001
High school	0.030 (0.051)	0.557	0.108 (0.054)	0.044
Some college	0.043 (0.051)	0.392	0.036 (0.056)	0.522
Got married/partnered	–0.300 (0.140)	0.032	–0.361 (0.172)	0.036
Got separated/divorced/widowed	0.693 (0.103)	0.000	0.576 (0.105)	0.000
Change in non-housing assets	–0.001 (0.003)	0.682	0.0001 (0.004)	0.975
Job tenure years (lagged)	–0.001 (0.001)	0.427	–0.001 (0.001)	0.618
Occupation type (lagged)				
Managerial	0.376 (0.285)	0.187	0.062 (0.277)	0.822
Professional	0.381 (0.285)	0.181	0.118 (0.277)	0.669
Sales	0.371 (0.288)	0.198	0.105 (0.279)	0.708
Administrative	0.406 (0.284)	0.153	0.107 (0.276)	0.698
Service	0.477 (0.285)	0.094	0.117 (0.277)	0.673
Farming, fishing	0.547 (0.316)	0.083	0.116 (0.302)	0.700
Mechanical	0.498 (0.288)	0.084	0.080 (0.280)	0.775
Operators	0.374 (0.286)	0.190	0.160 (0.277)	0.564
S&P 500 returns (lagged)	0.055 (0.101)	0.584	–0.156 (0.113)	0.168
Intercept	–0.751 (0.464)	0.105	–0.309 (0.518)	0.551
Number of subjects	2994		3000	
Hausman specification test statistic ( <i>p</i> -value)	17.43 (0.36)		8.43 (0.93)	

**Table 3**

Impact of job loss and expectations on CES-D with reemployment adjustment coefficients (standard errors) and *p*-values from random effects models.

Variables	Age group			
	45–54 Year		55–65 Year	
	Est. (SE)	<i>p</i> -Value	Est. (SE)	<i>p</i> -Value
Suffered business closure, reemployed	0.257 (0.169)	0.128	0.281 (0.194)	0.148
Suffered business closure, unemployed still	0.461 (0.221)	0.037	0.212 (0.170)	0.213
Job loss expectation (lagged)	–0.036 (0.065)	0.577	0.153 (0.070)	0.029
Displaced (reemployed) × expectation (lagged)	–0.002 (0.004)	0.577	–0.003 (0.006)	0.627
Displaced (unemployed) × expectation (lagged)	0.0002 (0.005)	0.964	–0.006 (0.004)	0.192
Age at baseline	0.007 (0.007)	0.289	0.005 (0.007)	0.481
Female	0.056 (0.038)	0.141	0.031 (0.039)	0.428
Non-white	0.029 (0.042)	0.489	0.001 (0.046)	0.978
Highest level of education				
Less than high school	0.125 (0.063)	0.048	0.215 (0.062)	0.001
High school	0.031 (0.051)	0.545	0.108 (0.054)	0.045
Some college	0.043 (0.051)	0.393	0.036 (0.056)	0.521
Got married/partnered	–0.298 (0.140)	0.033	–0.359 (0.172)	0.037
Got separated/divorced/widowed	0.692 (0.103)	0.000	0.575 (0.105)	0.000
Change in non-housing assets	–0.001 (0.003)	0.680	0.0001 (0.004)	0.978
Job tenure years (lagged)	–0.001 (0.001)	0.423	–0.001 (0.001)	0.626
Occupation type (lagged)				
Managerial	0.376 (0.285)	0.187	0.069 (0.277)	0.802
Professional	0.381 (0.285)	0.181	0.125 (0.278)	0.653
Sales	0.370 (0.288)	0.200	0.111 (0.280)	0.690
Administrative	0.406 (0.284)	0.153	0.114 (0.277)	0.680
Service	0.477 (0.285)	0.095	0.123 (0.277)	0.656
Farming, fishing	0.547 (0.316)	0.083	0.123 (0.302)	0.685
Mechanical	0.497 (0.288)	0.085	0.087 (0.280)	0.756
Operators	0.373 (0.286)	0.192	0.167 (0.277)	0.546
S&P 500 returns (lagged)	0.058 (0.101)	0.567	–0.158 (0.113)	0.164
Intercept	–0.742 (0.464)	0.110	–0.326 (0.518)	0.530
Number of subjects	2994		3000	
Hausman specification test statistic ( <i>p</i> -value)	19.12 (0.38)		14.83 (0.67)	