

The Great Recession, Older Workers with Disabilities, and Implications for Retirement Security

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Abstract

Evidence suggests that older workers with disabilities have been hit particularly hard by the recent recession. The increased difficulty in finding a job faced by individuals with disabilities, combined with the longer spells of unemployment experienced by all workers in this recession, could mean that laid-off disabled workers in their pre-retirement years may never return to work. In this paper, we use data from the 2004-2010 waves of the Health and Retirement Study to examine how the great recession has affected workers with chronic health conditions that put them at greater risk of disability. Our results suggest that increases in job losses were 30% greater for those with greater underlying risk of disability than for the general HRS population, and decreases in consumption were 20% greater. These results have important implications for the well-being of disabled individuals nearing retirement.

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I. Introduction

The Great Recession, officially beginning in December of 2007 and ending in June of 2009, lasted 18 months and as such was the longest recession faced by the United States since World War II. Incomes fell dramatically, poverty rates increased, and unemployment rates skyrocketed. Figure 1 graphs monthly unemployment rates for the U.S. from 2002-2012, and shows that the national unemployment rate doubled over this time period – rising from approximately 5% in much of 2005 and 2006 to a peak of 10 percent in October of 2009.¹

While unemployment rates rose across all groups in the recession -- people with and without disabilities, of all ages and across levels of educational attainment -- evidence suggests that workers with disabilities have been hit particularly hard by the recent recession. In 2010, the Bureau of Labor Statistics reported an unemployment rate of 14.8% for the disabled, compared with an unemployment rate of 9.4 for the overall population. Kaye (2010) finds that the 2007-09 recession disproportionately affected workers with disabilities, with the proportion of the employed workforce with disabilities falling by 9 percent.

The increased difficulty in finding a job faced by individuals with disabilities, combined with longer spells of unemployment experienced by all workers in this recession, could mean that laid-off disabled workers in their pre-retirement years may never return to work. In addition, the housing crisis implies that the largest asset for most families – their homes – may have lost value over this same time period. These trends could have particularly important implications for the disabled, since they have higher medical expenditures (Max et al., 1995) and are less financially prepared for retirement (Schimmel and Stapleton, 2010).

¹ National Bureau of Economic Research (2010). Even though the NBER dates the recession as beginning in December 2007, Figure 1 illustrates that unemployment rates did not really begin to climb dramatically until the fall of 2008. Similarly, even though the NBER dates the recession as ending in June of 2009 (based primarily on improvements in Gross Domestic Product and Gross Domestic Income), Figure 1 shows that unemployment did not peak until October of 2009, and remained above 9 percent for all of 2010.

One potential complication in studying the relationship between employment patterns of the disabled and the Great Recession is that most national data sets that measure employment have only limited measures of disability status. A large literature discusses the validity of self-reports of disability, and in many cases these self-reports appear to respond endogenously to economic conditions and to the availability of income transfers for the disabled. Specifically, if a “justification bias” exists in self-reports of disability, so that individuals with health conditions are more likely to identify themselves as disabled when faced with a recessionary job loss, then some of the increase in the relative unemployment of individuals with disabilities may be due to increased self-reporting of disability, and may be independent of initial health conditions.

This paper uses data from the 2004-2010 waves of the Health and Retirement Study to examine how the Great Recession has affected older workers with disabilities. The HRS surveys individuals 50 and older so our results are limited to older workers. We use two distinct measures of disability. We take advantage of the detailed array of health-related questions in the HRS and use Principal Components Analysis (PCA) to create detailed measures of “disability risk” among the subsample of HRS respondents who are working in 2004. In separate analyses, we also use self-reported measures of health-related work limitations. We examine whether recessionary effects on a number of outcomes, including employment, job loss, and involuntary job loss, as well as the level of consumption, are greater for those individuals we identify as high risk for disability. Finally, we directly examine whether, holding “disability risk” constant, self-reports of work limitations increase during the years of the Great Recession.

Our analysis shows that HRS respondents show an increased likelihood of reporting health-related work limitations during the Great Recession, even after controlling for detailed underlying health conditions that are associated with disability. We find that involuntary job changes increase for the entire HRS sample during the recession, but increase by even more for those with bad underlying health. Finally, like Hurd and Rohwedder (2010, 2011), we find evidence of consumption declines during the Great Recession. Our analysis suggests that these drops in consumption are 20 percent larger for respondents with greater risk of disability.

II. Background

The economic downturn that began in 2007 hit three major components of the portfolio of working families – labor markets, stock markets, and housing markets. While stock markets have recovered considerably, high unemployment rates and weak housing markets have persisted. For pre-retirement individuals in their 50s, a job loss in this economic environment has the potential to have long term implications for financial security. They are at the point in their life-cycle often associated with high wages and peak retirement saving. Laid-off workers, especially those with chronic health conditions or disabilities, may not have enough productive working years in which to recover from the losses in labor income and financial wealth. They might also face age discrimination in hiring when trying to find another job. Furthermore, the decrease in housing prices, combined with excessive borrowing against home equity in the years prior to the housing crisis, may mean that individuals are unable to sell their homes in response to job loss and financial distress.

Several recent papers have examined hardship experienced by older Americans due to the recession. Hurd and Rohwedder (2010, 2011) document declines in consumption among older individuals, as well as increases in pessimism, increased expectations of retiring later, and reduced and reduced probabilities of leaving bequests. Shapiro (2010), using the Cognitive Economics Study, finds that the consumption of those with financial wealth who were presumably affected by the stock market collapse fell between 2008 and 2009, but that the consumption of non-wealth holders actually fell by more.

In addition, evidence suggests that workers with disabilities have experienced particularly large declines in employment during and after the recession. Data from the 2008 to 2010 Current Population Survey (CPS) show that individuals with disabilities experienced a 12.3 percent decline in employment, compared with a 3.4 percent decline for working aged adults without disabilities (Kaye, 2010). During the 1980s, employment rates for the disabled also fell during recessions and rose during expansions, although this was not true during the 1990s, which saw continuous drops in employment rates among the disabled that were independent of the business cycle (Burkhauser et al., 2002).

Even during non-recession years, individuals in poor health are significantly more likely to leave the labor force (Bound et al., 1999). Furthermore, individuals with disabilities have considerably lower labor force participation rates than individuals without disabilities, and among those in the labor force, those with disabilities have higher unemployment rates, lower wages, and higher poverty rates (Bound and Burkhauser (1999), Stapleton and Burkhauser (2003), Houtenville et al. (2009)). The disabled also experience higher rates of material hardship (She and Livermore, 2007) and food insecurity (Huang et al., 2010).

However, the cross-sectional differences in unemployment rates between those with and without disabilities may not be able to be interpreted clearly due to the complexity of identifying individuals with disabilities in survey data. As outlined in the seminal disability model of Nagi (1965), disability is determined by a complex interplay of health conditions and the socioeconomic environment. Thus, objective measures of health may be problematic for examining the effects of disability on work outcomes, since they measure health and not work capacity (Bound, 1991). Instead, researchers have relied on subjective measures of disability --usually questions that ask a respondent to self-report whether they have a disability that limits work or limits their normal activities.

However, these self-reported measures are also imperfect for identifying disability. A large literature has examined the extent to which self-reported measures of disability are endogenous to current employment status and to the availability of income transfers for the disabled. That is, holding health and impairments constant, individuals may be more likely to report that they are disabled if they are not employed or if they are applying for or receiving disability benefits. Waidmann et al. (1995) note that “self-reported health measures are sensitive to the availability of these programs because individual’s views of their health, particularly of their ability to perform their “normal” activities, may differ on whether they are working or are receiving disability insurance.” Benitez-Silva et al. (2009) use data from a number of OECD countries and show a positive correlation between self-reported work disability rates and unemployment rates, which they conclude could be showing some of this type of justification bias. When looking at trends in disability and employment over the business-cycle, the negative effects of recessions on employment of people with disabilities may be biased upward.

However, other studies fail to find such evidence. Dwyer and Mitchell find no evidence of justification bias in the HRS. Benitez-Silva et al. (2004) find that individual's self-reports of their disabilities in the HRS are, on average, the same as the Social Security Administration's determination of their disabilities. They do find a share of the population that appears to overstate their disability relative to SSA, but they find an equally large share of the population that does the opposite. This is echoed by Burkhauser et al. (2002), who report that in the National Health Interview Survey (NHIS), of those who reported being deaf or blind, only 38% and 69% also reported a work limitation. They conclude that the work limitation questions "systematically exclude those with impairments who are well-integrated into the labor force." This could lead to an undercounting of working individuals with disabilities (Houtenville et al. 2009).

The research documenting the potential bias associated with subjective work limitation questions led to the Federal adoption of a six question series on functional limitations, which has been used in a number of nationally representative data sets, including the Current Population Survey. This sequence is meant to capture a more exogenous measure of disability. However, it has been found to do a poor job of capturing disability, primarily on the lower end of the severity distribution. For example, of those respondents whose labor force status is coded as disabled in the 2010 CPS, only 67.5 percent are identified as disabled by the six functional limitation questions (Kaye, 2010). Of respondents receiving Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI) benefits, individuals who are subject to the Social Security Administration's stringent disability determination process, only 63.3 are considered disabled by the six question sequence (Burkhauser et al., 2011).

Even with these data limitations in mind, considerable evidence documents (1) the impact of the recession on well-being of workers as a whole and (2) that unemployment rates among individuals with disabilities have risen, even relative to unemployment rates among workers without disabilities. What can be inferred, but has not been quantified, is the extent to which the increases in unemployment are due to job loss versus an increase in incidence of self-reported disability. In addition, there is no evidence to date on the impact of the recession on the overall well-being of individuals with disabilities.

III. Data and Methodology

We use data from the Health and Retirement Study for the years 2004-2010. This allows us to cover the period prior to and during the Great Recession (as well as 2010, which although the year after the recession was officially over, still had unemployment rates above 9%). The HRS is a longitudinal study of individuals 50 and older and their spouses or partners. It began in 1992 and has re-interviewed sample members every two years until their death, and it has aged in younger cohorts every six years. We limit our sample to individuals who were working in 2004 to focus our study on the role of the differential effects of health conditions and disability on outcomes during economic downturns.

Because of the limitations of survey responses to questions on disability described in the previous section, we use two methods to identify workers at risk of leaving the labor force due to disability. The first uses the traditional health-related work limitation question which asks, “Now I want to ask you how your health affects paid work activities. Do you have any impairment or health problem that limits the kind or amount of paid work you can do?” The second method makes use of the fact that, unlike other large datasets typically used to study U.S. labor market behavior, the HRS asks a number of questions about chronic health

conditions and impairments that often underlie disability. We include responses to questions asking if a doctor has ever told the respondent that he or she has/had one of the following nine chronic conditions: chronic lung disease, hypertension, diabetes, cancer, heart disease, stroke or transient ischemic attack (TIA), psychiatric disease, arthritis or rheumatism, and memory related disease. We also have data on the following, some of which are based on a series of questions in the HRS: body mass index, self-reported health status, CESD score (for depression), immediate word recall score, delayed word recall score, and mobility index.² We use responses from 2004 for all of these variables to minimize any reverse causality in reporting due to the economic downturn. Together, these questions provide fifteen different risk factors for disability. There is substantial collinearity across these variables, in part due to significant comorbidities. For example, individuals with diabetes are more likely to also report having heart disease or strokes. We use principal component analysis (PCA) to synthesize the information contained in these measures into a smaller set of regressors.

PCA uses an orthogonal transformation to convert a set of possibly correlated variables into a set of linearly uncorrelated variables called principal components. Each component is a weighted linear combination of the original variables. The transformation is defined in such a way that the first principal component explains the most variance in the original data of all the components. Each succeeding component must be orthogonal to the preceding components, i.e. it is capturing the variance in an additional dimension of the data. The procedure provides the same number of factors as the number of variables that are used. However, because the marginal variance explained by each successive factor is declining, it provides a way to collapse a large set of correlated variables into a smaller set of uncorrelated

² We have also estimated our equations excluding self-reported health from the PCA calculation and the results are similar.

regressors. In the analyses that follow, we use the first three components from the PCA of disability risk factors, which together explain 42 percent of the variance across the variables. Appendix A provides the weights or factor scores that were applied to each of the fifteen health variables to construct the three PCA components.³

We examine three labor market outcomes in 2006, 2008, and 2010, among respondents who are working for pay in the prior wave. First, we look at employment – whether the respondent is currently working – in part to be comparable with the previous literature. Next, we look at whether the respondent is no longer at the job they had in the prior wave (regardless of whether they are currently working), since work by Bound et al. (1999) suggests that individuals in poor health may change jobs to deal with their health conditions. Finally, we look at involuntary job loss -- whether the respondent is no longer at the job they had in the prior wave due to involuntary reasons. This could be particularly important among the disabled, since previous research suggests that disabled workers may be the first to be laid off in a recession (Kruse and Schur, 2003).

For each outcome we estimate regressions using OLS of the form:

$$(1) L_{it} = \alpha + \beta X_{it} + \gamma D_{it} + \tau Y_t + \rho D_{it} * Y_t + \varepsilon_{it}$$

Where L is the labor market outcome; X is a vector of individual characteristics including financial, housing, and business wealth in 2004, the natural log of earnings in 2004, age and age squared; D is one of the two measures of disability risk, which capture any time-invariant differences in labor market outcomes by disability risk; Y is a vector of year effects for 2008 and 2010, with 2006 as the pre-recession reference year, and ε is a time-varying error term. The year effects of 2008 and 2010 identify our recession years, and therefore the coefficients

³ For a more detailed description of PCA, see Vyas and Kumarayanake (2006).

on these variables represent the effect of the recession on the labor market outcome for our entire sample. Even though the recession officially goes from 2007-2009, Figure 1 clearly illustrates that the unemployment effects of the recession are later in time. The unemployment rate in 2008 was relatively low, and the unemployment rate in 2010 was quite high, despite the fact that the recession was officially over by this point. We therefore expect to see larger “recession” effects in 2010 than in 2008. We then interact the disability measure with the 2008 and 2010 indicators to identify whether the labor market effects of the recession were disproportionately felt by workers with greater risk of disability. When we use responses to the work limitation question to measure disability risk, D is a dichotomous variable. When we use the principal component measures, we include the first three principal component factors. The interaction with the year dummies uses just the first factor.

Next, to test whether individuals do respond endogenously to the work limitation question, we estimate an equation of the same form as (1), but with the self-reported, time-varying work limitation as the dependent variable. We use the three principal component factors for D to control for respondents’ detailed health conditions, and therefore their underlying risk of having or developing work limitations. A positive coefficient on the year effects would provide evidence that responses to the work limitation question do vary with macroeconomic conditions. Because we control for the underlying disability risk using fifteen measures of health conditions and impairments, it would minimize the possibility that any estimated increase is due to an increase in disability incidence. We first estimate the equation using only baseline values of the principal component factors, to control for baseline “disability risk,” which should be exogenous with respect to the future economic climate. However, to tease out whether any observed increase in reporting of work limitations is due to

contemporaneous increases in disability risk, or if there are increases even while holding contemporaneous health constant, we also estimate the equation using contemporaneous PCA factors.

Finally, some have argued that consumption is a better measure of well-being than employment and income variables, since households can often smooth consumption in response to income shocks (Cutler and Katz, 1992). Other work has found significant consumption declines during the Great Recession (Hurd and Rohwedder, 2010 and 2011; Shapiro, 2010). Stephens (1991) finds that households where the head becomes disabled do not experience decreases in consumption until two years after the onset of the disability, which implies that the disabled do have some ability to smooth consumption.

Correspondingly, we will examine whether individuals with greater disability risk experienced declines in consumption during the recession, relative to individuals without disabilities. To do so, we use data from the 2005, 2007, and 2009 Consumption and Activities Mail Survey (CAMS) of the HRS to examine consumption responses to the recession.⁴ We use equation (1) again for our regression specification, but with the natural log of total household consumption as the dependent variable. In these regressions, Y is a vector of year effects for 2007 and 2009, with 2005 as the reference year.

IV. Results

Table 1 presents descriptive statistics for the sample used in our analyses. As described in the prior section, we limit our sample to respondents in the 2006, 2008, and 2010 HRS who reported working in the previous wave. The average age of respondents pooled

⁴ CAMS asks respondents about spending in 32 categories, and comes very close to matching the Consumer Expenditure Survey (CEX), which has long been used to track consumption in the U.S.

across these years is 65. We considered limiting the sample to non-elderly respondents, but given that the age of “normal retirement” has become increasingly fluid in recent years, and given that paid employment is an important component of income for many elderly individuals, we decided that the labor market outcomes of all respondents who were working when last observed was of interest, regardless of age.⁵

We find that 78 percent of respondents working in a wave are working in the next wave. However, almost a third of the sample leaves a job between two waves and about three percent experience an involuntary change in employment since the prior wave.⁶ Fifteen percent of respondents report having a health condition that limits the kind or amount of paid work they can do. We report the mean for the first three PCA factors which we use in the analysis. While the units have no clear interpretation, we will use the standard deviation of the PCA to discuss the magnitude of our regression estimates. Figure 2 illustrates the just slightly skewed distribution of the first PCA factor, which has a mean of -0.79, a minimum of -3.91 a maximum of 6.15, and a standard deviation of 1.32.

Table 2 has estimates for regressions of equation (1) for the three labor market outcomes described above. The first column for each dependent variable uses respondents’ contemporaneous report of having a work limitation, and the second column uses the principal component factors. In columns 1 and 2, looking at current employment, we find that significantly fewer workers continue to work in 2010 relative to 2006, but that there are no significant differences between 2006 and 2008. However, given the timing of the national increase in unemployment shown in Figure 1, this may not be surprising.

⁵ Hurd and Rohwedder (2010) find that the recession hit HRS respondents under the age of 65 harder than those respondents 65 and older. In the next version of this paper, we will estimate our regressions separately for those who are under 65 and those who are 65 and older.

⁶ This includes individuals who are currently working and individuals who are not working.

Consistent with previous literature, we find that respondents who worked in the prior wave but report a work limitation are 29.2 percentage points less likely to be working, or 38 percent less likely to be working than the overall sample, which has an employment rate of 78 percent. However, as is well documented in the literature, this measure has been found to partly reflect whether survey respondents are employed when they are asked this question. When we use the principal component factors, based on responses to health questions prior to the recession in the 2004 wave, we also find that individuals who were working in 2004 but who were identified as at risk of disability because of their 2004 health conditions are significantly less likely to work in subsequent years. The coefficients from the three PCA factors together imply that a one standard deviation increase in each of the PCA factors would decrease the probability of working by 8.1 percentage points. However, examining the interaction terms, we find no evidence using either measure of disability risk, that the economic downturn that began in 2008 and persisted in 2010 had a greater effect on the employment status of workers with disabilities or health conditions.

Columns 3 and 4 of Table 1 report regression coefficients for the dependent variable of whether the respondent left the job they held in the prior wave. Estimates from both models indicate a significantly greater number of job separations in 2008 and 2010 relative to 2006, even after controlling for our set of individual characteristics. Consistent with our employment results, we find that workers with disabilities, identified either by the work limitation question or the PCA, are more likely to have left their job. In addition, the increased job separation observed in 2010 is even larger for workers with disabilities. Individuals who report work limitations were 10 percentage points more likely to have left their job between 2008 and 2010, relative to other workers in that time period. The less endogenous measure

of health conditions given by the PCA indicates that a one standard deviation higher PCA factor is associated with a 2.5 percentage point increase in job separation in 2010, which is statistically significant at the 10 percent level. Compared to the coefficient estimate of 0.213 on the year 2010 indicator, this estimate suggests that individuals with baseline health poor enough to give them a PCA score one standard deviation higher than the mean faced a 12 percent additional increase in the probability of job separation.

The last two columns of Table 2 examine involuntary job loss. The number of respondents reporting involuntary job loss is relatively small, limiting the precision of our estimates. Nevertheless, there are significant increases in involuntary job loss over the 2006-2008 period relative to the 2004-2006 period. Our results suggest that a one standard deviation increase in PCA is associated with a 1.7 percentage point increase in involuntary job loss in 2006-2008. Compared to the coefficient estimate on the year 2008 indicator of 0.057, this suggests that a one standard deviation higher PCA score is associated with a 30 percent increase in the likelihood of involuntary job loss between 2006 and 2008.

Table 3 examines the extent to which survey responses to the work limitation question are a function of the macroeconomic environment. We test whether more respondents report having a work limitation in 2010 and 2008, relative to 2006, when controlling for individual disability risk using the principal component factors. The first three rows of the table show the strong relationship between the factors and future reports of work limitations. A one standard deviation increase in the first PCA factor is associated with a 12 percentage point greater likelihood of reporting a work limitation. We find that relative to 2006, reporting a work limitation was 3.6 percentage points more likely in 2010. To examine whether the increased reporting in 2010 is more pronounced for those at higher risk (i.e. those with higher

PCA scores), we estimate a second specification where the year indicators are interacted with the first PCA score. The estimated coefficient on the interaction of year 2010 and PCA1 is not significantly different from zero, suggesting that the increase in reporting a work limitation in 2010 was independent of underlying health conditions. Because the increased reporting of a work limitation in 2010 is estimated when controlling only for *baseline* disability risk, it is possible that some of the increase is due to increases since baseline in incidence of health conditions. To see if this is the case, we separately estimate similar equations, while controlling for contemporaneous principal component factors. We find that while the estimates change slightly, they are not significantly different than those reported in Table 3, suggesting that there is a true increase in reporting work limitations, even when controlling for any changes in actual health conditions over this time period. While we do not include these estimates in the paper, they are available upon request.

Table 4 examines whether individuals in worse health, as measured by the PCA factors, suffered greater consumption declines during the great recession than others. We observe nine percent lower consumption across all respondents in 2009 relative to 2005. The interaction of the first principal component factor and the 2009 indicator show that the 2009 decline was larger for individuals in worse health as measured by the PCA factor. A one standard deviation increase in PCA is associated with an additional 1.9 percent drop in consumption, which is 20 percent higher than the average consumption decline of nine percent for the sample as a whole.

V. Discussion and Conclusion

In this paper, we use data from the core Health and Retirement Study and the Consumption and Activities Mail Survey supplement to the HRS to estimate the effect of the “great recession” on older workers with disabilities. Because of the panel nature of the HRS and a breadth of questions on chronic health conditions and disabilities, employment history, and consumption, we are able to provide a deeper understanding of the labor force dynamics and well-being of workers with disabilities than has been possible with previously available data.

Our results are consistent with previous research suggesting that self-reports of work limitations increase in recessions, and make clear the importance of having detailed information on health conditions to complement any analysis of labor market impacts on the disabled.

While the Great Recession is associated with decreases in employment for the overall HRS sample, we find no evidence that these decreases are larger for those individuals who are in poor health and at risk of disability. However, we do find that the impact of the recession on the probability that individuals report that they are no longer at their previous job is significantly larger for those respondents in poor underlying health. We find a similar result for involuntary job loss. We also find recession-related declines in consumption that are significantly larger for those in poor health.

The fact that we find no differential recession effect for employment among the disabled but we do find differential effects for job loss is interesting and a bit of a puzzle. Work by Bound et al. (1999) has suggested that those in poor health appear to change jobs, which might allow them to adapt to their health conditions and continue to participate in the labor force. However, our consumption results suggest that the disabled are faring worse in

terms of economic well-being during the recession. Another possibility is that disabled individuals are switching into jobs that are less desirable – perhaps that pay less or that are part time instead of full time. Further research is necessary to examine these possibilities.

Overall our results confirm that workers approaching retirement ages in poor health appear particularly vulnerable to the economic downturn. The findings suggest a potential role for policies that support individuals to remain employed in their current jobs when possible. The vulnerability to economic downturns should also be considered during assessments of reforms to Social Security OASDI, Medicare, Medicaid and private health insurance.

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Figure 1: U.S. Monthly Unemployment Rate 2002-2012

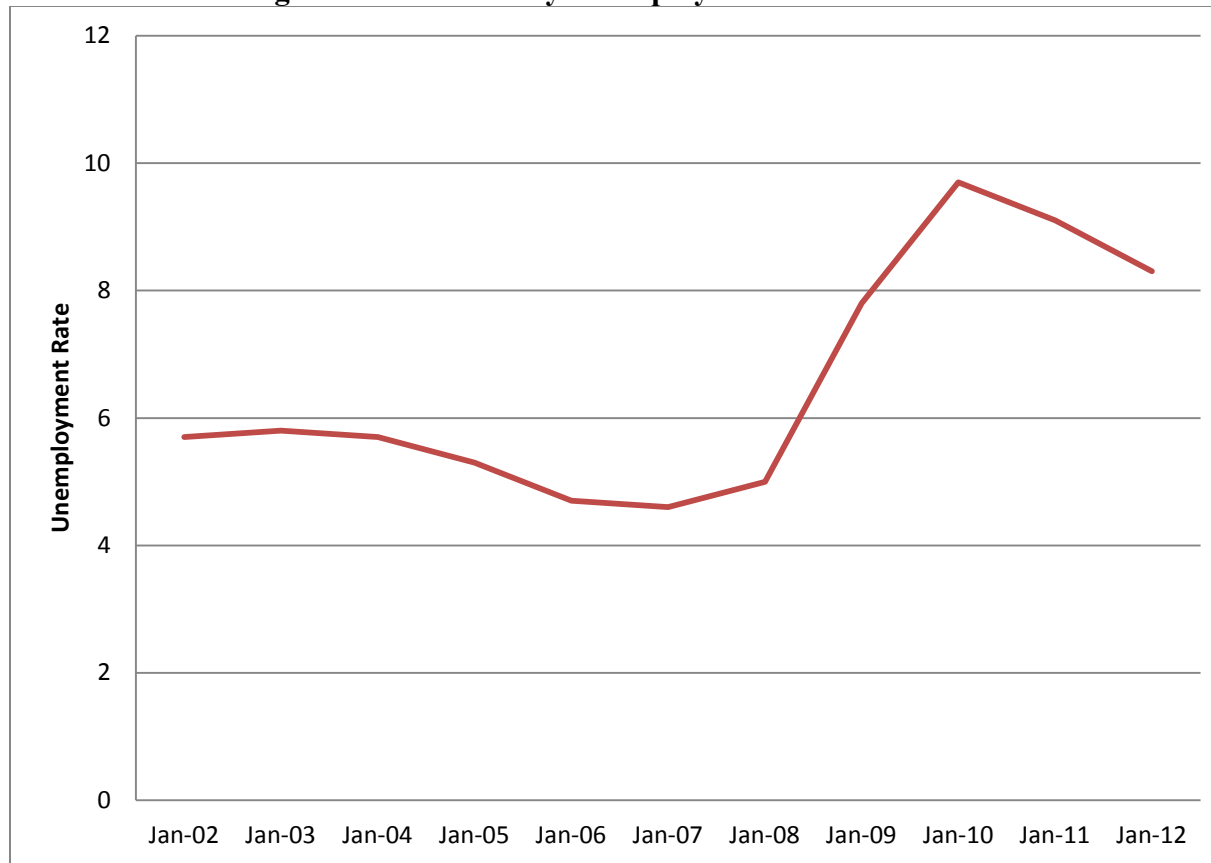


Figure 2: Probability Density Function of the PCA Risk Score 1

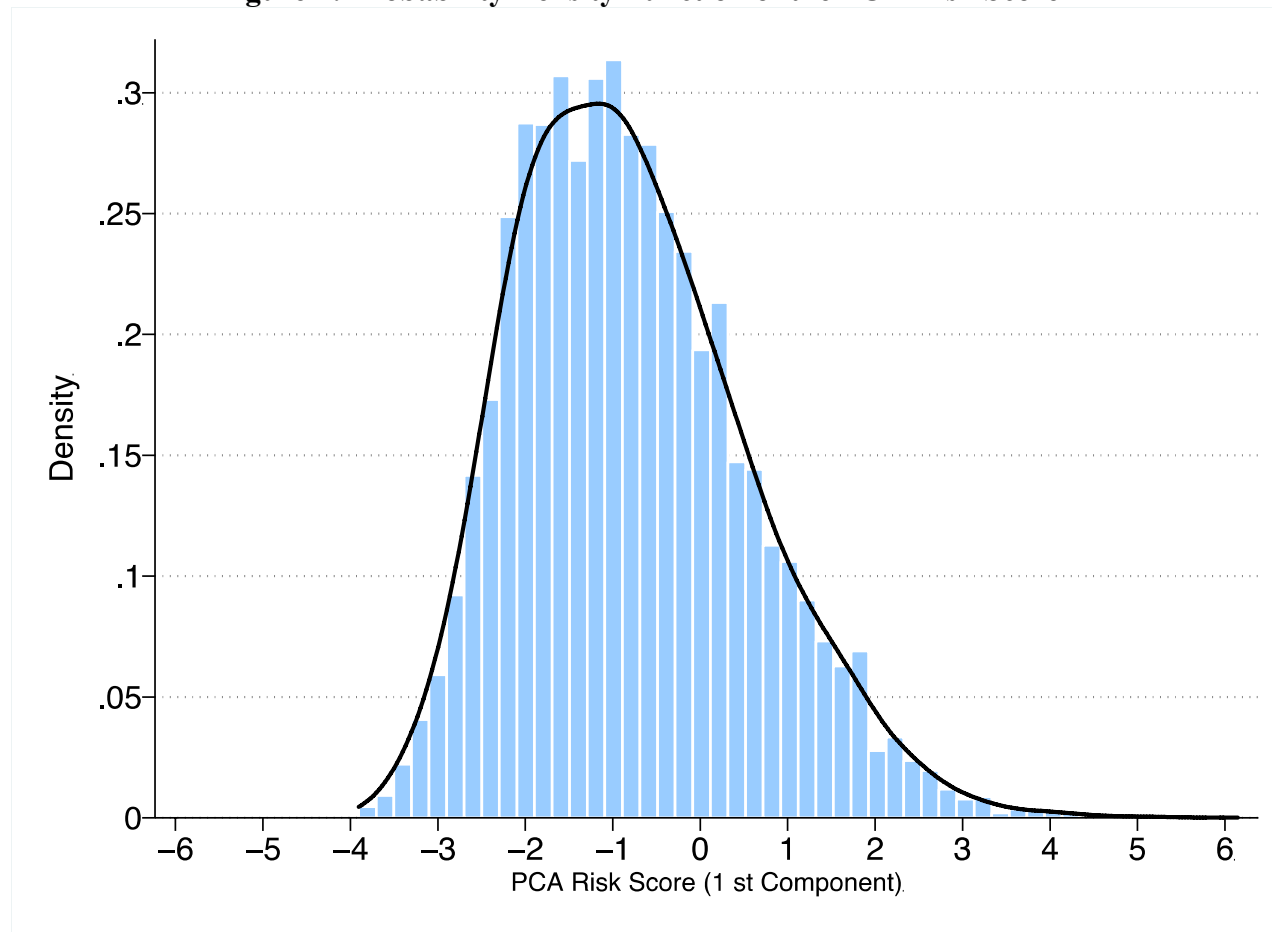


Table 1: Summary Statistics for HRS Analysis Sample

	<u>Percent of Sample</u>	
Male	0.45	
Health limitation	0.15	
Currently working	0.78	
No longer at job held in prior wave	0.29	
Involuntarily change in employment since prior wave	0.03	
	<u>Mean</u>	<u>Standard Deviation</u>
Age	65.36	7.44
Total consumption	42,441	761,260
Financial wealth (2004)	243,849	1,649,199
Business wealth (2004)	172,708	740,402
Housing wealth (2004)	211,376	703,361
Earnings (2004)	35,420	44,074
PCA 1	-0.79	1.32
PCA 2	0.22	1.11
PCA 3	-0.07	0.98
N	9,657	

Note: Sample is made up of HRS respondents in 2006, 2008, and 2010 who reported working for pay in the prior wave.

Table 2: OLS Results of Labor Market Outcomes, HRS 2006-2010

<i>Dependent Variable</i>	<u>Working</u>		<u>Left Prior Job</u>				<u>Left Job Involuntarily</u>			
<i>Disability Measure</i>	<u>Work Lim.</u>	<u>PCA</u>	<u>Work Lim.</u>	<u>PCA</u>	<u>Work Lim.</u>	<u>PCA</u>	<u>Work Lim.</u>	<u>PCA</u>	<u>Work Lim.</u>	<u>PCA</u>
Health Limitation	-0.292 (0.024)	**			0.091 (0.019)	**			-0.002 (0.004)	
PCA 1			-0.039 (0.005)	**			0.012 (0.006)	**		0.000 (0.001)
PCA 2			-0.009 (0.005)	*			0.004 (0.005)			0.000 (0.003)
PCA 3			-0.020 (0.005)	**			0.011 (0.006)	*		0.004 (0.003)
<i>Year Dummies</i>										
2008	-0.001 (0.014)		0.019 (0.017)		0.116 (0.015)	**	0.130 (0.014)	**	0.046 (0.006)	0.057 (0.007)
2010	-0.053 (0.015)	**	-0.085 (0.019)	**	0.170 (0.018)	**	0.213 (0.017)	**	0.048 (0.006)	0.057 (0.008)
PCA 1 * 2008			0.008 (0.008)				0.012 (0.008)			0.013 (0.004)
PCA 1 * 2010			-0.011 (0.009)				0.019 (0.011)	*		0.005 (0.005)
Health Lim * 2008	0.075 (0.042)				0.012 (0.040)				0.000 (0.016)	
Health Lim * 2010	-0.048 (0.039)				0.105 (0.038)	**			0.028 (0.017)	*

Note: Sample is made up of HRS respondents in 2006, 2008, and 2010 who reported working for pay in the prior wave.

** Denotes statistical significance at the 5% level, * at the 10% level.

Table 2 (continued): OLS Results of Labor Market Outcomes, HRS 2006-2010

<i>Dependent Variable</i> <i>Disability Measure</i>	Working				Left Prior Job				Left Job Involuntarily			
	Work Lim.		PCA		Work Lim.		PCA		Work Lim.		PCA	
Age	-0.048 (0.013)	**	-0.043 (0.014)	**	0.040 (0.011)	**	0.037 (0.010)	**	-0.017 (0.005)	**	-0.015 (0.004)	**
Age squared	0.0003 (0.000)	**	0.0003 (0.000)	**	-0.0003 (0.000)	**	-0.0003 (0.000)	**	0.0001 (0.000)	**	0.0001 (0.000)	**
Financial Wealth in 2004	-1.20E-09 (6.19e-10)		-1.24E-09 (6.08e-10)	**	7.61E-10 (9.72e-10)		1.01E-09 (1.07e-09)		-5.87E-10 (2.72e-10)	**	-4.97E-10 (2.29e-10)	**
Business Wealth in 2004	2.10E-08 (4.25e-09)	**	1.86E-08 (4.08e-09)	**	-8.30E-09 (9.87e-09)		-7.09E-09 (1.04e-08)		-4.99E-09 (8.52e-10)	**	-4.42E-09 (8.50e-10)	**
Housing Wealth in 2004	5.28E-09 (6.08e-09)		3.88E-09 (5.46e-09)		-1.07E-08 (7.98e-09)		-9.44E-09 (7.73e-09)		-3.01E-09 (1.43e-09)	**	-2.14E-09 (1.19e-09)	*
Log Earnings 2004	-0.002 (0.001)	**	-0.001 (-0.001)		0.006 (0.001)	**	0.005 (0.001)	**	0.000 (0.001)		0.001 (0.000)	
Constant	2.711 (0.435)	**	2.469 (0.467)	**	-1.277 (0.370)	**	-1.144 (0.353)	**	0.608 (3.65)	**	0.566 (0.157)	**
N	9,226		9,226		9,229		9,343		9,229		9,343	
R-squared	0.095		0.0472		0.052		0.0445		0.0208		0.0235	

Note: Sample is made up of HRS respondents in 2006, 2008, and 2010 who reported working for pay in the prior wave.

** Denotes statistical significance at the 5% level, * at the 10% level.

Table 3: OLS Estimates of Reporting a Work Limitation, Controlling for Baseline Principle Component Factors, HRS 2006-2010

	(1)		(2)	
PCA 1	0.091 (0.006)	**	0.095 (0.007)	**
PCA 2	0.053 (0.005)	**	0.053 (0.005)	**
PCA 3	0.038 (0.006)	**	0.038 (0.006)	**
<i>Year Dummies</i>				
2008	-0.013 (0.008)		-0.024 (0.012)	*
2010	0.036 (0.013)	**	0.038 (0.017)	**
PCA 1 * 2008			-0.013 (0.007)	*
PCA 1 * 2010			0.001 (0.008)	
Age	-0.023 (0.010)	**	-0.023 (0.009)	**
Age squared	0.0002 (0.000)	**	0.0002 (0.000)	**
Financial Wealth in 2004	-8.15E-10 (4.95e-10)	*	-8.21E-10 (4.95E-10)	*
Business Wealth in 2004	4.38E-09 (4.60e-09)		4.35E-09 (4.60E-10)	
Housing Wealth in 2004	-3.86E-09 (1.54e-09)	**	-3.87E-09 (1.54E-09)	**
Log Earnings 2004	-0.005 (0.001)	**	-0.005 (0.001)	**
Constant	0.954 (0.328)	**	0.960 (0.328)	**
N	9,229		9,229	
R-squared	0.150		0.152	

Note: Sample is made up of HRS respondents in 2006, 2008, and 2010 who reported working for pay in the prior wave. ** Denotes statistical significance at the 5% level, * at the 10% level.

Table 4: OLS Estimates of Total Consumption, HRS CAMS 2005, 2007, 2009

	Ln(Total Consumption)	
PCA 1	-0.085 (0.009)	**
PCA 2	0.027 (0.009)	**
PCA 3	0.046 (0.012)	**
Age	-0.009 (0.013)	
Age squared	-2.35E-06 (0.000)	
Financial Wealth in 2004	2.30E-08 (7.24e-09)	**
Business Wealth in 2004	2.26E-07 (5.15e-08)	**
Housing Wealth in 2004	2.73E-07 (8.75e-08)	**
Log Earnings 2004	0.018 (0.003)	**
Year Dummies		
2007	-0.009 (0.012)	
2009	-0.091 (0.015)	**
PCA 1 * 2007	-0.011 (0.008)	
PCA 1 * 2009	-0.014 (0.008)	*
Constant	10.860 (0.423)	**
N	10,198	
R-squared	0.233	

Note: Sample is made up of HRS respondents in the 2005, 2007, and 2009 CAMS who reported working for pay in the prior core wave.

Appendix Table A: Principle Component Analysis Factor Scores

Variable	<u>Factor Score 1</u>	<u>Factor Score 2</u>	<u>Factor Score 3</u>
Chronic Lung Disease	0.1798	0.1564	0.2871
High Blood Pressure - Hypertension	0.2359	0.1055	-0.3967
Diabetes - High Blood Sugar	0.2277	0.1242	-0.4332
Cancer	0.0659	0.0193	0.0707
Heart Disease	0.2371	0.0385	-0.043
Stroke or Transient Ischemic Attack (TIA)	0.1895	-0.0818	0.044
Psychiatric Disease	0.2105	0.1824	0.4068
Arthritis or Rheumatism	0.2494	0.1687	-0.0559
Memory Related Disease	0.1474	-0.1102	0.3375
Body Mass Index	0.1573	0.3214	-0.408
Self-reported Health Status	0.4238	0.1114	0.0319
Mental Health (CESD Score)	0.3226	0.1143	0.3059
Immediate Word Recall Score (over 10)	-0.2921	0.5939	0.0904
Delayed Word Recall Score (over 10)	-0.2888	0.5949	0.0944
Mobility Index (over 5)	0.3978	0.1766	0.0553

The factor scores or weights for each variable where a positive factor score is associated with higher disability risk and conversely a variable with a negative factor score is associated with lower disability risk.

Appendix Table 1: Summary Statistics for HRS Analysis Sample

	<u>Percent of Sample</u>	
Male	0.45	
Health limitation	0.15	
Currently working	0.78	
No longer at job held in prior wave	0.29	
Involuntarily change in employment since prior wave	0.03	
	<u>Mean</u>	<u>Standard Deviation</u>
Age	65.36	7.44
Total consumption	42,441	761,260
Financial wealth (2004)	243,849	1,649,199
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PCA 1	-0.79	1.32
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N	9,657	

Note: Sample is made up of HRS respondents in 2006, 2008, and 2010 who reported working for pay in the prior wave.

Appendix Table 2: OLS Results of Labor Market Outcomes, HRS 2006-2010

<i>Dependent Variable</i>	<i>Working</i>		<i>Left Prior Job</i>				<i>Left Job Involuntarily</i>			
<i>Disability Measure</i>	<u>Work Lim.</u>	<u>PCA</u>		<u>Work Lim.</u>	<u>PCA</u>		<u>Work Lim.</u>	<u>PCA</u>		
Health Limitation	-0.292 (0.024)	**		0.091 (0.019)	**		-0.002 (0.004)			
PCA 1		-0.039 (0.005)	**		0.012 (0.006)	**		0.000 (0.001)		
PCA 2		-0.009 (0.005)	*		0.004 (0.005)			0.000 (0.003)		
PCA 3		-0.020 (0.005)	**		0.011 (0.006)	*		0.004 (0.003)		
<i>Year Dummies</i>										
2008	-0.001 (0.014)		0.019 (0.017)		0.116 (0.015)	**	0.130 (0.014)	**	0.046 (0.006)	**
2010	-0.053 (0.015)	**	-0.085 (0.019)	**	0.170 (0.018)	**	0.213 (0.017)	**	0.048 (0.006)	**
PCA 1 * 2008			0.008 (0.008)						0.012 (0.008)	**
PCA 1 * 2010			-0.011 (0.009)					*	0.019 (0.011)	
Health Lim * 2008	0.075 (0.042)				0.012 (0.040)				0.000 (0.016)	
Health Lim * 2010	-0.048 (0.039)				0.105 (0.038)	**			0.028 (0.017)	*

Note: Sample is made up of HRS respondents in 2006, 2008, and 2010 who reported working for pay in the prior wave.

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Appendix Table 2 (continued): OLS Results of Labor Market Outcomes, HRS 2006-2010

<i>Dependent Variable</i>	Working				Left Prior Job				Left Job Involuntarily			
<i>Disability Measure</i>	<u>Work Lim.</u>		<u>PCA</u>		<u>Work Lim.</u>		<u>PCA</u>		<u>Work Lim.</u>		<u>PCA</u>	
Age	-0.048 (0.013)	**	-0.043 (0.014)	**	0.040 (0.011)	**	0.037 (0.010)	**	-0.017 (0.005)	**	-0.015 (0.004)	**
Age squared	0.0003 (0.000)	**	0.0003 (0.000)	**	-0.0003 (0.000)	**	-0.0003 (0.000)	**	0.0001 (0.000)	**	0.0001 (0.000)	**
Financial Wealth in 2004	-1.20E-09 (6.19e-10)		-1.24E-09 (6.08e-10)	**	7.61E-10 (9.72e-10)		1.01E-09 (1.07e-09)		-5.87E-10 (2.72e-10)	**	-4.97E-10 (2.29e-10)	**
Business Wealth in 2004	2.10E-08 (4.25e-09)	**	1.86E-08 (4.08e-09)	**	-8.30E-09 (9.87e-09)		-7.09E-09 (1.04e-08)		-4.99E-09 (8.52e-10)	**	-4.42E-09 (8.50e-10)	**
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Log Earnings 2004	-0.002 (0.001)	**	-0.001 (-0.001)		0.006 (0.001)	**	0.005 (0.001)	**	0.000 (0.001)		0.001 (0.000)	
Constant	2.711 (0.435)	**	2.469 (0.467)	**	-1.277 (0.370)	**	-1.144 (0.353)	**	0.608 (3.65)	**	0.566 (0.157)	**
N	9,226		9,226		9,229		9,343		9,229		9,343	
R-squared	0.095		0.0472		0.052		0.0445		0.0208		0.0235	

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