What Explains Changes in Retirement Plans during the Great Recession?

By Gopi Shah Goda and John B. Shoven and Sita Nataraj Slavov[*]

The economic recession which began in December 2007 resulted in a sharp decline in the valuation of equity markets and a pronounced reduction in economic activity. Numerous media reports indicated that this recession, commonly termed the "Great Recession," has caused many workers to delay retirement due to the declines in individual wealth resulting from the sharp fall in asset values. For example, *The Wall Street Journal* reported in April 2008, "Investment advisers and retirement planners...say they are seeing large numbers of older workers put off retirement as the housing and stock-market troubles have deepened."[1] By September 2008, the problem had only gotten worse: "With nest eggs shrinking, housing prices still falling and anxieties about their financial future growing, the oldest members of the baby-boom generation are putting the brakes on plans to leave the office."[2]

However, there are several reasons to think that the economic downturn might not have had such dramatic effects on retirement behavior. Gustman, Steinmeier and Tabatabai (2009a, 2009b) suggest that the average person approaching retirement age is not likely to have suffered a substantial financial shock from the stock market downturn in 2008-2009 because the current generation of retirees do not have a large amount of their wealth in defined contribution plans. In addition, increased layoffs brought on by the recession may increase the amount of involuntary retirements, pushing in the opposite direction (Gustman et al. 2009a, 2009b).

In this study, we first document the shift in individuals' self-reported probabilities of working at age 62 and 65, as well as their self-reported expected retirement ages, by analyzing data from two waves of the Health and Retirement Study (HRS), a nationally representative panel survey of individuals 50 and over. We show that all three measures increased significantly between the 2006 and 2008 waves of the survey, suggesting that older workers planned to remain attached to the labor force and delay retirement.

We then examine how three principal economic factors – the value of the stock market, housing prices, and local labor market conditions – contributed to the changes in the expectations of labor market behavior. We exploit variation in these components induced by plausibly exogenous assignment of the date a person was interviewed. Because the timing of the 2008 survey spanned diverse periods of economic activity, the changes in the economic factors were very different for individuals surveyed early in 2008 relative to late in the year. This variation is assumed to be exogenous to an individual's taste for retirement.

We find evidence that the steep drop in

[1] "Americans Delay Retirement As Housing, Stocks Swoon," *The Wall Street Journal*, April 1, 2008, page A1.

[2] "Baby Boomers Delay Retirement," *The Wall Street Journal*, September 22, 2008, page A4.

the stock market valuation increased the reported probability of working at age 62, but that this effect was at least partly attenuated by increasing unemployment. In addition, individuals who were older and therefore closer to retirement display stronger responsiveness to equity markets, but a weaker response to the unemployment rate. Finally, we find no evidence that fluctuations in housing wealth influenced expectations of labor market behavior.

I. Data and Methodology

A. Data

We utilize the 2006 and 2008 waves of the Health and Retirement Study (HRS). By applying for restricted data access, we are able to obtain the exact date of interview and detailed geographic identifiers for each respondent. Respondents are asked to estimate the probability that they will work full-time after age 62 (P62), the probability that they will work full-time after age 65 (P65), and the age at which they expect to stop working (E(R)). The first two measures are asked only of those who have not attained age 62 or 65, respectively, and all measures are only asked among respondents who are still working.

We use the S&P 500 index to capture aggregate fluctuations in the value of the stock market and obtain daily closing values of the index from Yahoo! Finance which are merged by date of interview. For some specifications, we compute the percent change in the S&P 500 in the year preceding the interview date. Third, we include controls for housing market fluctuations using the Federal Housing Finance Agency (FHFA) index based on all-transactions published on a quarterly basis for each state. Fourth, we merge in county-level unemployment rates during the month of interview.[3]

Table 1 reports the change in probabilities of working between the 2006 and 2008 waves in Panel A. The average probability of working at age 62 rose from 47.5 percent

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to 54.5 percent, and a similar but slightly smaller change occurred in the probability of working at age 65. During this period, stock and housing prices fell and unemployment rose. The variation across interview dates and geographic location is summarized in Panel B. While the average respondent from the 2008 wave experienced a loss in the S&P 500 index of 25 points (1.7 percent) since their previous interview, depending on the timing of interviews, the change ranged from a loss of 648 points (44.9 percent) to a gain of 190 points (15.5 percent). Our empirical strategy exploits variation in within-person changes in these factors under the assumption that HRS interviews occurred randomly throughout the year.

While we report results using all three measures of retirement plans, we note that the questions are asked at different points in the survey and there are inconsistencies in responses. Our view is that P62 and P65 are better measures of individuals' retirement plans because the questions underlying P62 and P65 are more explicit and less subject to individual interpretation.

B. Methodology

We focus on two specifications:

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\begin{aligned}
Y_{i,t} =\, & \alpha_0 + \alpha_1 \, ln(S\&P500_{i,t}) \\
& + \alpha_2 \, ln(FHFA_{i,t}) \\
& + \alpha_3 \, ln(unemp_{i,t}) \\
& + \alpha_4 \, \mathbf{X}_{i,t} + \theta \, s_{i,t} \\
& + \pi_i + \varepsilon_{i,t}
\end{aligned}
\tag{1}
$$

$$
\begin{aligned}
Y_{i,t} =\, & \alpha_0 + \alpha_1 \, \%\Delta S\&P500_{i,t} \\
& + \alpha_2 \, ln(FHFA_{i,t}) \\
& + \alpha_3 \, ln(unemp_{i,t}) \\
& + \alpha_4 \, \mathbf{X}_{i,t} + \gamma \, s_{i,t} \\
& + \lambda_i + u_{i,t}
\end{aligned}
\tag{2}
$$

where $Y_{i,t}$ is our measure of expected retirement plans (either P62, P65, or E(R)) for individual i in wave t; $S\&P500_{i,t}$ is the level of the S&P 500 index on individual i's interview date in wave t; $\%\Delta S\&P500_{i,t}$ is

TABLE 1—SUMMARY STATISTICS

Panel A: Work Probabilities

| | 2006 | | 2008 | | |
	Mean	Std. Dev.	Mean	Std. Dev.	N
P62	47.5	37.5	54.5	38.6	2,450
P65	31.1	34.5	36.4	36.3	3,135
E(R)	66.3	5.5	66.5	5.5	1,451

Panel B: Variation in Economic Variables in 2008

	Mean	Std. Dev.	Min	Max
S&P 500	1,273.7	151.9	752.4	1,426.6
Change in S&P 500 (prev. 12 months)	-13.5	10.6	-47.7	-2.9
County Unemployment Rate	5.75	1.87	1.90	23.30
State Housing Index (FHFA)	376.3	110.6	206.3	686.8

Notes: P62 denotes probability of working full-time at age 62, P65 denotes probability of working full-time at age 65, and E(R) denotes expected retirement age. S&P 500 denotes value of S&P 500 index on interview date. Change in S&P 500 denotes annual percent growth rate in S&P 500 during 12 months prior to interview date. Monthly unemployment rates measured at the county level and quarterly housing index measured at the state level. Panel A variables summarized for individuals with reported measures in both 2006 and 2008 waves. Panel B variables measured as of 2008, summarized for individuals who report P62 in 2006 and 2008 (N=2,450).

the percent change in the S&P 500 index in the year preceding individual i's interview date in wave t; $FHFA_{i,t}$ is the level of the housing index in individual i's state during the quarter of individual i's interview in wave t; $unemp_{i,t}$ is the unemployment rate in individual i's county during the month of individual i's interview in wave t; $\mathbf{X}_{i,t}$ is a vector of controls; $s_{i,t}$ is a vector of state dummies; π_i and λ_i represent unobserved individual heterogeneity; and $\varepsilon_{i,t}$ and $u_{i,t}$ are stochastic error terms. $\mathbf{X}_{i,t}$ includes age, marital status, retirement status of spouse (if married), homeownerhip status, self-reported health status, length of tenure at current job, an indicator for whether the current employer offers retiree health insurance, an interaction between homeownership status and the housing price index, and an interaction between high school completion and the unemployment rate. We take first differences of both equations to eliminate the individual heterogeneity, π_i and λ_i; with only two time periods, this method is computationally identical to including individual fixed effects. We report robust standard errors clustered at the household level.

Interpreting the estimated coefficients from Equations (1) and (2) as causal re-quires the assumption that changes over time in the value of the S&P 500 index, unemployment rates, and housing prices for an individual are exogenous to changes in his or her reported expectations of labor market activity. We argue that the changes in these economic factors are largely due to when in the year the respondent was interviewed, and that the interview date was more or less random.

II. Results

We report the results of estimating Equations (1) and (2) on our full sample in Table 2. We report only the coefficients on the S&P 500 level or growth rate, the unemployment rate, the housing index, and interactions including them.

The results in Column (1) indicate that a 10 percent increase in the level of the S&P 500 index decreases the probability of working after age 62 by 1.209 percentage points. In addition, the unemployment rate in the county is negatively associated with the probability of working after age 62: a 10 percent increase in the unemployment rate decreases the reported probability by 0.747 percentage points. Similar results are shown in Column (4) which imply that a

TABLE 2—DRIVERS OF CHANGES IN EXPECTATIONS OF LABOR MARKET BEHAVIOR, FULL SAMPLE

Dependent Variable:	(1) P62	(2) P65	(3) E(R)	(4) P62	(5) P65	(6) E(R)
ln(S&P 500)	-12.09**	-1.489	0.180			
	(5.550)	(4.825)	(0.796)			
Change in S&P 500				-18.58***	-6.110	-0.0837
				(7.184)	(6.100)	(0.981)
ln(unemp)	-7.470*	5.043	0.425	-8.220**	4.239	0.378
	(4.049)	(3.521)	(0.538)	(4.117)	(3.594)	(0.539)
ln(unemp)*HS or less	6.351	-0.965	-0.388	6.479	-0.850	-0.387
	(5.201)	(4.331)	(0.587)	(5.203)	(4.332)	(0.586)
ln(FHFA)	4.957	0.382	-1.549	5.096	0.280	-1.560
	(8.619)	(7.481)	(1.346)	(8.618)	(7.490)	(1.347)
ln(FHFA)*homeowner	0.261	0.213	0.0639	0.253	0.196	0.0626
	(0.462)	(0.476)	(0.115)	(0.461)	(0.476)	(0.115)
Observations	2,450	3,135	1,451	2,450	3,135	1,451
R-squared	0.073	0.060	0.170	0.074	0.061	0.170

Notes: Dependent variable indicated on column heading. All regressions include controls for age, marital status, retirement status of spouse (if married), homeownership status, self-reported health status, length of tenure at the current job, and an indicator for whether the current employer offers retiree health insurance. All regressions are run in first differences. Standard errors clustered at the household level.
*Significant at the 10 percent level **Significant at the 5 percent level ***Significant at the 1 percent level

10 percentage point increase in the growth rate of the S&P 500 (e.g., from 10 percent to 20 percent) decreases the probability of working after age 62 by 1.858 percentage points and a 10 percent increase in the unemployment rate decreases the probability of working after age 62 by 0.822 percentage points.

We find no evidence of a differential impact of the unemployment rate for respondents with lower levels of education and no evidence that changes in housing wealth influenced one's probability of working. We also find no evidence that the probability of working at age 65 or the expected retirement was driven by changes in the value of the stock market, unemployment rates, or housing indices.

We hypothesize that individuals who are closer to retirement age have less time to recover from wealth shocks, and are therefore more likely to adjust their plans. We therefore re-estimate Equations (1) and (2) for respondents aged 58 and over and report our results in Table 3.

We find that the estimated effect of changes in the stock market index on probabilities of working at age 62 and 65 are larger in magnitude for older workers relative to the full sample. For example, the estimates in Column (1) suggest that a 10 percent increase in the S&P 500 index leads to a 2.148 percentage point reduction in the probability of working at age 62. The effect of the unemployment rate is not statistically significant in the P62 regressions, but is positive and significant when the dependent variable is the probability of working at age 65. As in the full sample, we fail to find evidence for a relationship between housing wealth and expectations of work behavior for the older group.

III. Discussion

Our finding that changes in stock market indices affected retirement probabilities is at odds with those reported by Hurd and Reti (2001) and Hurd, Reti and Rohwedder (2005) who examine earlier periods. Sim-

TABLE 3—DRIVERS OF CHANGES IN EXPECTATIONS OF LABOR MARKET BEHAVIOR, AGE 58+

Dependent Variable:	(1) P62	(2) P65	(3) E(R)	(4) P62	(5) P65	(6) E(R)
ln(S&P 500)	-21.48***	-5.854	0.562			
	(7.968)	(5.885)	(0.904)			
Change in S&P 500				-32.70***	-12.87*	0.313
				(10.07)	(7.429)	(1.126)
ln(unemp)	-0.749	10.89**	0.468	-1.943	9.833**	0.412
	(6.004)	(4.426)	(0.638)	(6.042)	(4.492)	(0.640)
ln(unemp)*HS or less	3.277	-2.845	0.176	3.525	-2.672	0.171
	(7.161)	(5.440)	(0.689)	(7.129)	(5.439)	(0.689)
ln(FHFA)	-1.485	6.985	-1.199	-1.694	6.815	-1.224
	(12.34)	(9.440)	(1.480)	(12.29)	(9.440)	(1.487)
ln(FHFA)*homeowner	-0.0633	0.0148	0.0662	-0.0771	-0.00505	0.0654
	(0.872)	(0.672)	(0.113)	(0.875)	(0.671)	(0.113)
Observations	1,279	1,974	1,138	1,279	1,974	1,138
R-squared	0.089	0.075	0.190	0.092	0.076	0.189

Notes: See Table 2.
*Significant at the 10 percent level **Significant at the 5 percent level ***Significant at the 1 percent level

ilarly, Goda et al. (2010) do not find evidence that stock market performance and expectations regarding work behavior are linked when analyzing a longer time horizon that includes periods of large stock market gains in addition to steep drops.

However, the evidence presented in this paper suggests that those respondents interviewed when the stock market was at a sharply lower level reported higher probabilities of working at the age of 62 during the Great Recession. In particular, respondents interviewed when the S&P index was 10 percent lower increased their expectations of working at age 62 by 1.209 percentage points. This estimate exploits variation in the S&P 500 index within the 2008 wave of the HRS and controls for unobservable individual-level heterogeneity by utilizing the 2006 wave and estimating the coefficients in first-differences.

Because the results regarding the relationship between the stock market index and expectations of labor market behavior do not appear to be generalizable to other periods, we posit that this relationship is indicative of other factors which were correlated with stock prices during the Great Recession, rather than a relationship between expectations of work and the stock market per se. For example, it is possible that during the recent crisis, poor stock market performance was correlated with the level of pessimism about the economy, and that the latter was the true driver of individuals' perceptions of their retirement security. Alternatively, media coverage regarding the stock market may have been particularly salient in 2008 relative to earlier years.

We see some evidence that the unemployment rate had different effects for P62 and P65. Though the coefficients are not always statistically significant, they are generally negative when the left-hand side variable is P62 and positive when the left-hand side variable is P65. One possible explanation for these findings is that, under a shorter horizon, workers respond knowing that a higher unemployment rate is associated with a lower supply of jobs. On the other hand, over a longer horizon, workers may answer the survey question assuming the economy will adjust in the future and that more work is needed to overcome pre-

vious negative shocks in wealth.

Coile and Levine (2009) use cross-sectional CPS data and actual retirement behavior rather than panel data and self-reported retirement expectations but come to somewhat similar conclusions. They find that longer-term changes in stock market valuations appear to affect the retirement of workers aged 62 to 69, but no such evidence that these changes affected workers aged 55-61. They, however, find much stronger effects of the unemployment rate, particularly for less educated workers. They conclude that the increase in labor force participation caused by the stock market crash is substantially smaller in magnitude than the reduction in labor force participation as a result of the weak labor market.Finally, similar to this study, Coile and Levine (2009) do not find a relationship between retirement behavior and a regional house price index, even for homeowners. This finding is likely a reflection of the illiquidity of housing wealth for older homeowners.

IV. Conclusion

We find some evidence that plans for retirement shifted during the Great Recession. The average probability of working at age 62 reported by HRS respondents is significantly higher in 2008 than in 2006. Furthermore, respondents who experienced larger economic changes as a consequence of the time of year they were interviewed displayed more substantial effects. Individuals reported higher probabilities of working at age 62 when the stock market declined in value. However, this effect was at least partly attenuated by increasing unemployment which was accompanied by a reduction in the reported probability. Individuals closer to retirement reacted more strongly to stock market changes, and generally less strongly to changes in labor market conditions.

While we find some evidence that changes in the stock market and unemployment affected expectations of work, the magnitudes of the effects that we find are not large enough to explain the substantial shift in plans for retirement documented in Table 1. Further research is warranted to determine whether these higher expectations of working at older ages are realized in actual work behavior. In addition, we believe that other factors that may have been correlated with the stock market index during the Great Recession, including economic pessimism and salience of media coverage, warrant closer inspection.

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