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A structural analysis of the effects of the Great Recession on retirement and working longer by members of two-earner households☆

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This paper analyzes the effects of the Great Recession on the work and retirement of older working couples. We modify a structural model of the joint retirement decisions of husbands and wives (Gustman and Steinmeier, 2014), introducing heterogeneous and changing asset returns, layoffs and layoff risks, and responses to these sources of uncertainty. The modified model is then used to compare retirement and employment outcomes between a base simulation that assumes the absence of the Great Recession with outcomes produced in the presence of disturbances created by the Great Recession.

Layoffs create a loss of earnings from current employment, reduce the likelihood of reemployment, and reduce the wage offer in future employment. Although our previous models have incorporated the effects of layoffs on wages for subsequent employment, they did not treat layoffs and labor market prospects as uncertain. Losses in wealth from the Great Recession may also have affected retirement outcomes and continued labor market activity. To capture these effects, we model the heterogeneity in asset returns and modify the model to include the change in returns during the Great Recession both for those who lost their job and those who did not. We then estimate the extent to which changes in the value of their assets affected their retirement and continued labor force activity.

Our model of retirement and saving for two-earner, couple households is estimated using panel data from two cohorts from the Health and Retirement Study, War Babies born from 1942 to 1947, and Early Boomers born from 1948 to 1953. Retirement outcomes examined include the probabilities of full-time work, and of full and partial retirement for each spouse (including reversals from states of lesser to greater work), and the degree of coordination of retirement for husbands and wives.

The model

To describe our model of retirement, we begin with the sequence of decisions and stochastic events. The overall sequence of these events is depicted in Fig. 1.

In any year, the sequence begins with the state variables determined by decisions and stochastic events in prior years. The state variables include the level of assets at the end of the previous year, whether the individual was still in the career job in the previous year, whether the individual had been laid off or disabled in the previous year or prior years, the level of Social Security and pension entitlements at the end of the previous year, and the strength of leisure preferences at the end of the previous year. The pension entitlements may include both defined benefit and/or defined contribution components.

These state variables undergo a set of stochastic changes between the previous year and the current year. Mortality may affect one or both spouses, with consequences for the Social Security and pension amounts available to the surviving spouse. A stochastic rate of return will change the level of assets available during the current period as well as the level of any defined contribution amounts. A stochastic layoff will affect the individual's ability to work full-time. If a layoff occurs and the individual chooses to work full-time, the individual will experience a period of non-employment. Stochastic disabilities may also occur, after which the individual is unable to work. Moreover, for those who have retired, the preference for leisure may change once the individual experiences retirement.

The levels of the state variables in the previous period in conjunction with the stochastic changes define the possibilities available to the individual in the current period. These include the assets available in the current period, the employment possibilities available in the current period, and the individual's current preferences for leisure and retirement. If the individual has previously left the career job, full-time earnings reflect the loss of tenure. If the individual has previously been laid off, earnings in full-time work are adjusted to reflect an additional penalty. If the individual is currently being laid off, the opportunities for full-time work reflect the fact that there will be a period of non-employment. And if the individual has previously been disabled or becomes disabled in the current period, the only employment choice available is retirement.

Given these possibilities defined by the state variables of the

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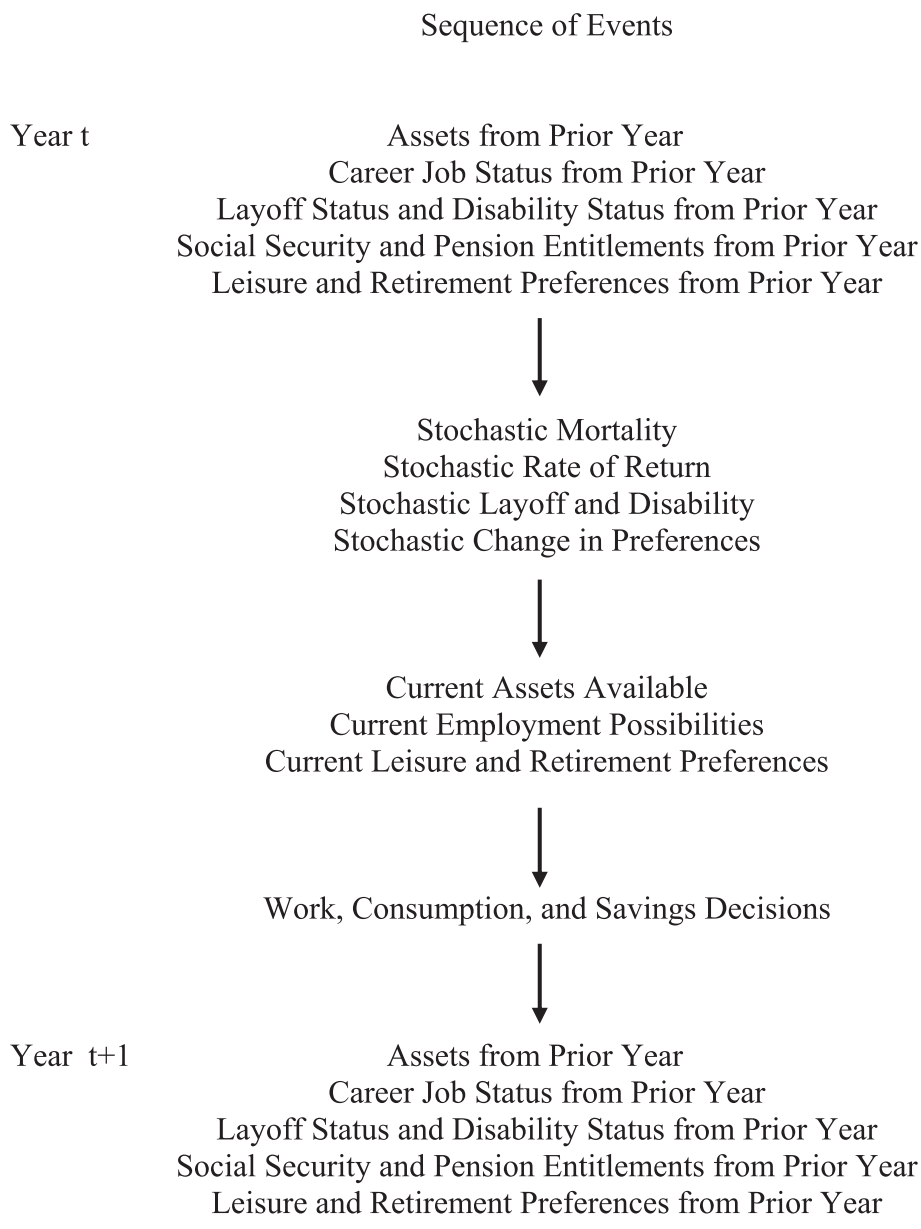

Fig. 1. Sequence of Events.

previous period and the stochastic outcomes, the individual chooses the amount of work (if the individual has not become disabled), the level of consumption, and the amount of savings. The amount of work is limited to three categories: full-time, part-time, or complete retirement. To reduce the computational burden, individuals are presumed to work full-time before age 50 and to retire at age 70.

These decisions in turn affect the levels of the state variables at the end of the period. End of period assets are computed from the assets of the previous period augmented by the stochastic rate of return, increased by the earnings of the work decision and any Social Security and/or pension benefits available, and reduced by consumption. Pension and Social Security benefits are assumed to be taken as soon as they are available. Defined contribution amounts are assumed to be available when the individual leaves the career job. If the individual continues to work in the career job, defined benefit entitlements increase and defined contribution amounts are added to the defined contribution account. If the individual works either full-time or part-time, Social Security entitlements are adjusted accordingly. Regarding the possibility that layoff expectations may have changed due to the Great Recession, the increased layoff probabilities and the increased time spent between a layoff and subsequent full-time employment appear to have persisted for only a couple of years, and hence it may be best to view these as bad random draws from the corresponding distributions, but not as a permanent change in those distributions.

The family retirement model described here is more complex than our previous family retirement model, increasing the computational burden substantially. The following calculations in the current model add considerable complexity to those in our previous model.

The previous model had one state variable to indicate whether the individual was still in the career job, had left the career job, or was deceased. In the current model that state variable now indicates whether the individual is still in the career job, has left the career job without a layoff, has left the career job with a layoff, or is deceased. That means that this state variable has increased from three categories to four categories, an increase of 33% in the state space. But a two-earner couple has two variables like this, and the total compounded increase in the state space is 78% ($1.33 \times 1.33 - 1 = 0.78$). The total number of calculations is approximately equal to the size of the state space, so this means a not quite doubling of the computational burden.

An additional increase in computation comes from treating SSDI as