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# DO STATE ECONOMICS OR INDIVIDUAL CHARACTERISTICS DETERMINE WHETHER OLDER MEN WORK?

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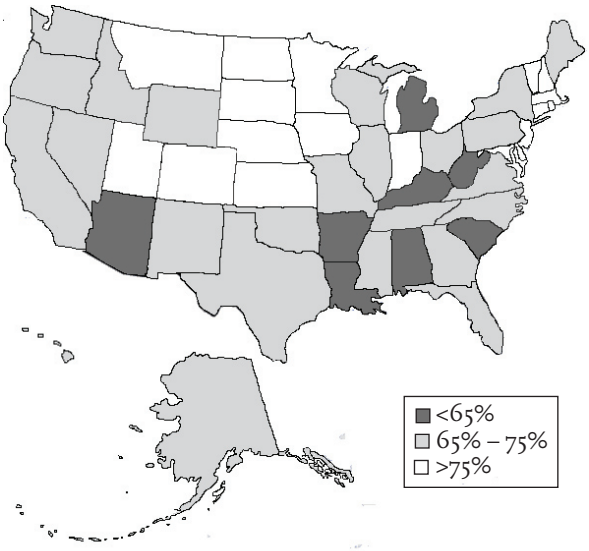
## Introduction

The difference in labor force participation rates of men aged 55-64 across the United States is astounding. For example, West Virginia has a participation rate below 60 percent, while South Dakota has a participation rate approaching 90 percent (see Figure 1). This fact in itself has significant implications for the pressures that states will face as the baby boom starts to retire in the face of a contracting retirement income system, declining housing prices, and a lackluster stock market.

Despite these marked differences, little is known about the reasons for such variations in work patterns. An earlier *brief*, using the *Current Population Survey* for the period 1977-2007, demonstrated that the differences in the labor force participation of older men were related to labor market conditions, the nature of employment, and the employee characteristics in each state as well as to a "pseudo replacement rate." These variables explained more than one-third of the total variation.[1]

Figure 1. Labor Force Participation Rates for Men Aged 55-64, by State, 2007




*Source*: Authors' calculations using the U.S. Census Bureau, *Current Population Survey* (CPS), 2007.

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The question remains whether these relationships reflect different populations or unique aspects of the states. The first section of this *brief* reviews the earlier state-level findings using the *Current Population Survey* (CPS). The second section turns to the *Health and Retirement Study* (HRS) to sort out the relative role of state versus individual characteristics in explaining the differences in labor force participation rates across states. It presents two equations for the probability of working for men in their late fifties and early sixties. The first includes just the state-level variables, and the second the state-level variables and the HRS demographic and economic information for each individual. The results show that the state-level variables explain very little of the variation in the probability that a particular individual will be working, but most of the state-level variables are statistically significant both before and after the inclusion of the HRS information. The final section concludes.

## Results from the *Current Population Survey*

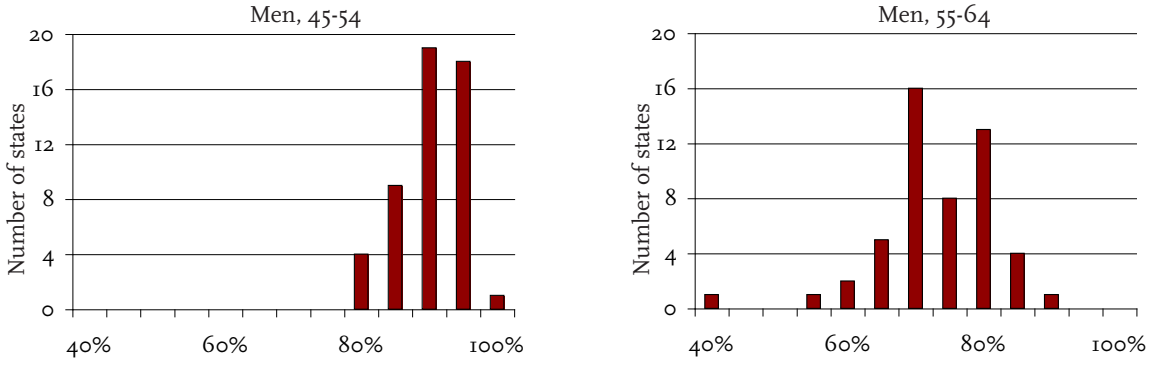
The enormous variation in the labor force activity of older men is shown in Figure 2. While prime-age workers' participation rates cluster closely around 90 percent, those for men aged 55-64 range from below 60 percent in three states (West Virginia, Kentucky, and Alabama) to nearly 90 percent in South Dakota.[2]

A substantial amount of this variation can be explained by a handful of variables.[3]

- *Pseudo replacement rate*: Ratio of the median income for *retired* households aged 65-74 to the median income of *working* households aged 55-64.
- *Unemployment rate*: Bureau of Labor Statistics' ratio of unemployed to total labor force.
- *Percent of men in self-employment jobs*: Percent of all employed men aged 16-64 who report being self-employed.
- *Percent of men in manufacturing*: Percent of employed men aged 16-64 in the manufacturing industry.
- *Percent of men aged 55-64 with a college degree*: Percent of men aged 55-64 who report having a college degree.
- *Percent of men aged 55-64*: Men aged 55-64 as a percent of the total population of men aged 16-64.

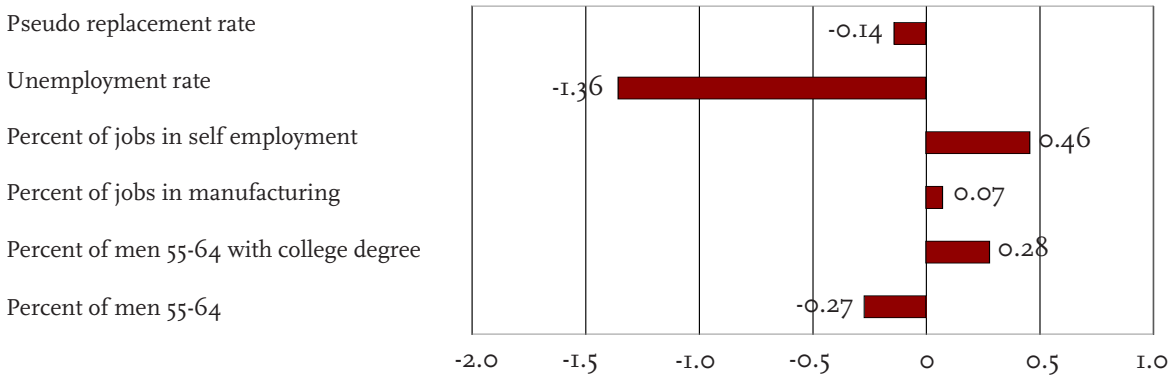
Figure 3 on the next page shows the results of a regression that used pooled CPS data for the period 1977-2007. The coefficients represent the change in labor force participation rates from a one-percentage point change in each of the explanatory variables. Thus, a 10-percentage point increase in the state replacement rate is associated with a reduction of 1.4 percentage points in the labor force participation rate. Similarly, a 1 percentage point increase in the unemployment rate implies a 1.4 percentage point reduction. The percent of men aged 55-64 relative to those 16-64 also is associated with lower labor force participation, a finding consistent with the hypothesis that a large number of workers in this age group depresses wages and reduces their work effort through the substitution effect. In contrast to the negative effects,

Figure 2. Distribution of State Labor Force Participation Rates of Men Aged 45-54 Versus Men Aged 55-64, 2007




*Source:* Authors' calculations from the 2007 CPS.

Figure 3. Factors that Affect the Labor Force Participation of Men Aged 55-64, CPS, Pooled Regression, 1977-2007




*Note*: All variables are statistically significant.
*Source*: Authors' calculations using the 1977-2007 CPS.

a large percent self-employed, a high proportion in manufacturing, and a greater percentage of the workforce with college degrees all are positively related to the labor force participation of older workers. (See Appendix Table A1 for the full regression results).

Two variables merit discussion because their coefficients could have taken on another value or have another interpretation. First, the relationship between manufacturing and labor force participation is complicated. On the one hand, manufacturing jobs are typically associated with traditional pensions and physically demanding work, both of which create incentives for early retirement. Thus, states with a high manufacturing concentration might be more likely to have low labor force participation rates among workers approaching retirement – a *negative* relationship. On the other hand, manufacturing jobs tend to be good jobs, particularly for low-skilled workers. These jobs tend to pay well and offer some degree of security (e.g. through union protection). So, low-skilled workers with manufacturing jobs may find it both more desirable and more feasible to work longer than those who are trying to piece together a living in the lower-paying, non-unionized service sector. In this case, states with a high manufacturing concentration might be more likely to have high labor force participation rates among workers approaching retirement – a *positive* relationship. A *positive* relationship might also emerge when looking at the relationship between trends in manufacturing and labor force participation if a negative shock, such as the decline in the steel industry, caused both to decline over time. In fact, the literature generally does find a positive association between manufacturing and labor force participation, and that is what appears in Figure 3.[4]

Second, the negative relationship between the age structure and labor force participation rates could emerge because some states, such as Florida and Arizona, could be retirement magnets – a large number of older people go there once they stop working. Thus, those 55-64 would represent a large share of the population and the labor force participation rates of this group would be low. But no causal link would exist.

The message coming out of the analysis of the CPS data is that large variations exist among the states in the labor force participation rates of older men and this variation appears to be related systematically to the median pseudo replacement rate for the state, labor market conditions, the nature of employment, and the characteristics of the workers. The question is whether these results are due to differences in older workers' characteristics in the states or due to state-specific characteristics.

## Results from the *Health and Retirement Study*

In order to sort out the relative importance of the individual as opposed to state characteristics, we turn to the HRS. This nationally-representative data set began in 1992 with subsequent interviews every two years.[5] The original survey interviewed people aged 51-61 (born 1931-1941) and their spouses. War Babies (1942-1947) were added in 1998, and Early Baby Boomers (1948-1953) were added in 2004, bringing the total sample to more than 22,000.[6] The HRS contains detailed information on education, job history, health, and many other demographic and economic factors that could affect men's decision to work.

The question under investigation is whether, say, Massachusetts has higher labor force participation of older men than, say, West Virginia because of something special about Massachusetts or its economy or because highly educated people, who tend to work longer, make up a greater share of the Massachusetts population.[7]

The analysis involves three steps. First, we assign each respondent in the HRS the state-level variables used in the CPS analysis. All West Virginia residents in a given year, in other words, are characterized by the *state's* pseudo-replacement rate, unemployment rate, etc. Second, we estimate an equation, using just these state variables, to explain the probability of working for males aged 55-64 from all seven waves of the HRS. Third, we add the respondents' demographic and economic information from the HRS and estimate a second equation with both the state-level variables from the CPS and these HRS variables. Given the binary nature of the dependent variable, the model is estimated using a probit regression.

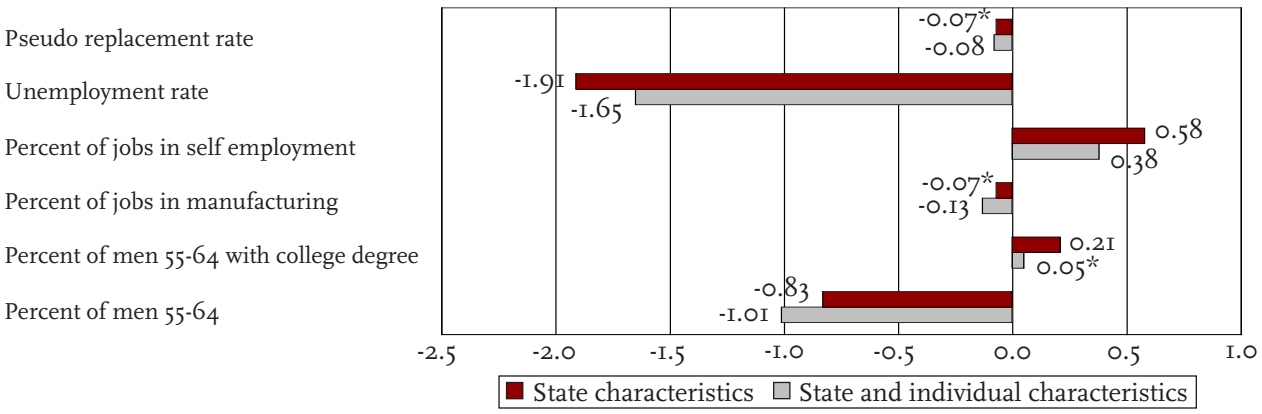
Summary results for the state-level variables from the two equations are shown in Figure 4. (A complete description of variables and regression results is presented in Appendix B.) Not surprisingly, given the wide variation among individuals in a particular state, the overall state-level variables taken from the CPS explain only a miniscule amount of the variation (pseudo $R^2$ of 0.005) in individual labor force participation rates among older workers in the HRS. Interestingly, however, all the coefficients with the exception of manufacturing, are statistically significant and have the same signs as in the CPS state-level regression.[8] That is, HRS men in states with a high replacement rate and high unemployment rate have a lower probability of being in the labor force. Those in states where a large percent of the jobs are in self-employment and where a high percent of the population has a college degree are more likely to be employed. The association between the probability of working and the share of men aged 55-64 is negative, probably picking up the "retirement-state" phenomenon.[9]

The second equation adds to the state-level variables the economic and demographic information for the individual respondent. This information falls into three categories: demographics (age, college, nonwhite, fair/poor health, and married), characteristics of the spouse (working, fair/poor health, and earnings), and respondent's wealth (owns a home and financial assets). The full results are shown in Appendix Table B2. Not surprisingly, the regression using these variables is much more capable, than the regression using only state-level variables, in explaining the probability that a particular individual in the HRS will be working (pseudo $R^2$ of 0.143 compared to 0.005 for the state-level variables alone).

As expected, older individuals and individuals in fair/poor health are less likely to be working than their counterparts. Having greater financial wealth is associated with a low probability of working. Having a college degree, having a working spouse or spouse in poor/fair health, and being a homeowner are associated with a higher probability of being employed. While having a high-earning spouse is associated with a lower probability of working relative to having a low-earning spouse, overall married men are more likely to be working than singles.

Interestingly, as shown in Figure 4, the state-level variables still matter even after controlling for individual characteristics. And the coefficients suggest an economically meaningful effect. An increase in the state's unemployment rate of one percentage point is associated with a 1.65 percentage point decline in the probability of a particular individual being employed. The higher the state's median replacement rate, the lower the probability of being employed; a

Figure 4. State-Level Factors that Affect the Probability of Working, Men Aged 55-64, HRS, 1992-2004




* Variables are not statistically significant.

*Source*: Authors' calculations using University of Michigan, *Health and Retirement Study* (HRS), 1992-2004.

10-percentage-point difference is associated with a 0.8-percentage-point difference in the employment probabilities. Individuals in states with higher shares of self-employed workers have a higher probability of being employed. The coefficient of the education variable is no longer significant, suggesting the absence of any state-level effect, whereby those in states with high numbers of diligent college grads might be encouraged to mimic their highly educated brethren by working longer.

The overall conclusion from the HRS analysis is that the state-level variables on their own, despite their statistical significance, explain very little of the variation in the probability of working among individuals. In contrast, the HRS information about the individuals' economic and demographic circumstances does provide substantial explanatory power. But the really interesting result is that even after including the HRS information, the state-level variables remain important. It is as if the HRS information determines whether respondents have a strong taste or weak taste for work, which allows for predicting whether the individual will be in the labor force or not. And once that prediction is made, the state-level variables indicate how both those with strong and weak tastes will respond to changes in, say, the unemployment rate. (See Box for further details).

## Explanatory Power

Read this section only for fun. Some might find it puzzling that the state characteristics explain 34 percent of the variation in labor force participation rates across states in the CPS based state-level regression shown in Appendix Table A1, but explain less than 1 percent of the variation in individual labor force participation in the HRS-based regression shown in Appendix Table B2. An explanation for this puzzle is provided in Table 1 and the accompanying discussion, which reconciles the predictive power of the individual-level and state-level regressions.

Table 1. Explanatory Power of Predicted State-Level Labor Force Participation Rates on Actual Rates, HRS, 1992-2004

| Variables included | R-squared |
|---|---|
| 1. State characteristics | 0.356 |
| 2. Individual characteristics | 0.390 |
| 3. State and individual characteristics | 0.498 |

*Note*: State level equations are estimated using predicted labor force participation from the individual level equations aggregated over states.
*Source*: Authors' calculations using the 1992-2004 HRS.

Table 1 shows the portion of the variation in the labor force participation rates across states that is explained ($R^2$) from alternative equations that are based on individual HRS data that have been aggregated to the state level.[10] This aggregation is done for the *actual* HRS labor force participation rates and for the *predicted* labor force participation rates that are derived from individual-level equations that incorporate: 1) state characteristics only; 2) individual characteristics only; and 3) state and individual characteristics.

An example might help. The 1996 HRS shows 200 men aged 50-64 from the state of New York. Out of these 200, 120 reported working for pay. Therefore, the *actual* labor force participation rate, from the individual HRS data, for New York in 1996 was 60 percent. That is, the individual level data of New York (200 observations) are aggregated to the state level data (1 observation for New York).

The next step is to *predict* each individuals' probability of working from the HRS regressions in Table B2. In equation one, the *predicted* probability that an individual is working is estimated from the equation that uses state characteristics only. In this case, each individual in New York would be characterized by the same state variables and thus have the same probability of working – the predicted labor force participation rate for New York in 1996. In equation two, the predicted probabilities would depend on individual characteristics alone. In equation three, the predicted probabilities would depend on both individual and state-level characteristics. As equations two and three include individual-level characteristics, men in New York in 1996 end up with different probabilities of working. These probabilities are then averaged to produce *predicted* state labor force participation rates. Thus if half the men in New York, in 1996, in these regressions had a probability of working of 0.4 and half a probability of 0.6, the average *predicted* labor force participation rate in New York would be 0.5. Table 1 shows the results of regressing these *predicted* aggregated rates on the *actual* state labor force participation rates.

Although the ability of state characteristics to predict individual labor force participation in the HRS is extremely low, these state variables explain 36 percent of the variance in average labor force

participation rates across states in the HRS data – approximately the same $R^2$ as in the CPS regression in Appendix Table A1. The $R^2$ from the individual characteristics state-level regression is 0.39. This can be interpreted as implying that differences between states in the distribution of individual characteristics can explain 39 percent of the variance among states in labor force participation. The $R^2$ jumps to 0.50 when both individual and state characteristics are included in the state-level regression. The reason that the $R^2$ increases by less when the state characteristics are added to the individual characteristics, than when they enter on their own, is due to their correlation with the state means of the individual characteristics.

So, although the characteristics of the state in which someone lives are not very useful in predicting that person's labor force participation, the state characteristics are very useful in predicting average state-level labor force participation rates. A lot of their predictive power comes from their correlation with the means of individual characteristics. But even after controlling for individual characteristics, the state characteristics retain some independent predictive power.

# Conclusion

The big news is that labor force participation of men aged 55-64 varies enormously among the states. This fact has significant implications for the differential burdens that states are going to face as the baby boom approaches retirement. In states where more than 40 percent of men are out of the labor force before age 65, a huge proportion of older men will have no access to health care except that provided by the state government.

Using state-level data, it is possible to explain with a handful of variables more than a third of the variation across states in labor force participation. These variables include for each state for each year, a pseudo replacement rate, the unemployment rate, the percent of men self-employed, percent of men in manufacturing, percent of men aged 55-64 with a college degree, and the ratio of men aged 55-64 to the total population.

The question is whether the relationship between the labor force activity of older workers is due to different populations or unique aspects of the state. That is, does Massachusetts have higher labor force participation of older men than West Virginia because of something special about Massachusetts or its economy or because, for example, highly educated people, who tend to work longer, also tend to live in Massachusetts. The answer from the analysis with the *Health and Retirement Study* is that most of the variation in the probability of working is attributable to the characteristics of the individuals. But the results also confirm the findings of two recent studies that differences in the nature of state economies, or the characteristics of their employers, affect the labor force participation rates of older workers, even after controlling for individual characteristics.[11]

These findings suggest, that states will face varying degrees of pressure as the baby boomers start to retire, and that characteristics of state economies affect the likelihood that older workers can remain in the labor force longer. But the larger conclusion is that individuals characteristics are far more important in terms of extending working careers. Thus, the best way for policymakers to help struggling states is to develop policies that target individuals with particular characteristics rather than states themselves.

# Endnotes

1 Munnell, Soto, and Zhivan (2008).

2 Differences in labor force participation of women across metropolitan areas have been documented by Odland and Ellis (1998). The variability in labor force participation of men is consistent with the notion of large and persistent differences in employment growth rates across states (see Blanchard and Katz, 1992).

3 See Munnell, Soto, and Zhivan (2008). Note that variables describing unemployment rate, percent in self-employment jobs, and percent in manufacturing jobs are measured for broader groups of the population, not just men aged 55-64. Measuring these state explanatory variables specific for men aged 55-64 would introduce measurement error due to the smaller sample size and would also increase the chance of some of the regressors being endogenous.

4 See Edmiston (2006) and Feasel and Rodini (2002).

5 The HRS is conducted by the Institute for Social Research (ISR) at the University of Michigan and is made possible by funding from the National Institute on Aging. More information is available at the ISR website: http://hrsonline.isr.umich.edu/. See Juster and Suzman (1995) for a detailed overview of the survey.

6 In addition, the HRS includes data on Children of the Depression (1923-1930) and AHEAD (those born before 1923).

7 The HRS only provides information on the percent of individuals employed, which differs from labor force participation in that it excludes those who are unemployed but are seeking work. For the purposes of this study, we use these terms interchangeably.

8 The shift in the sign of the coefficient of the manufacturing variable may reflect the differing time periods in the two analyses. Over the entire 1977-2007 period used in the earlier study, the *positive* relationship may reflect the downward trend in both manufacturing and labor force participation in those states hard hit by global competition. By the 1990s, when the HRS data set begins, much of the decline was over, and the *negative* relationship between manufacturing employment and the probability of working may reflect the early retirement incentives in defined benefit plans generally offered by manufacturing firms.

9 An alternative specification uses instrumental variables to account for the endogeneity due to the "retirement state" phenomenon. We instrumented the share of men aged 55-64 with the residuals from an equation of the share of men aged 55-64 as a function of three variables (the migration rate of 55-64 year old men, the percent of 55-64 year old men who migrated for retirement reasons, and the difference in temperature between December and February.) The instrumental variable estimation slightly reduces the magnitude of the relationship between the share of men aged 55-64 and labor force participation.

10 Only states with at least 20 individual-level observations were used in these regressions. The following states did *not* meet this criterion for all of the years: Alaska, Delaware, District of Columbia, Hawaii, Idaho, Kentucky, Maine, Montana, Nevada, New Mexico, Rhode Island, South Dakota, Utah, and Vermont. Note that some of the remaining states were excluded in certain years when the number of observations was less than 20.

11 See Black and Liang (2005) and von Wachter (2007).

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# APPENDICES

# Appendix A – *Current Population Survey* Analysis

Table A1. Factors that Affect the Labor Force Participation of Men Aged 55-64, CPS, Pooled Regression, 1977-2007

| Variables | Coefficient | t | Mean | SD |
|---|---|---|---|---|
| Pseudo replacement rate | -0.140 | -9.17 | 0.587 | 0.116 |
| Unemployment rate | -1.355 | -12.65 | 0.058 | 0.020 |
| Percent of jobs in self employment | 0.457 | 9.68 | 0.129 | 0.043 |
| Percent of jobs in manufacturing | 0.073 | 3.17 | 0.200 | 0.082 |
| Percent of men 55-64 with college degree | 0.276 | 10.72 | 0.220 | 0.093 |
| Percent of men 55-64 | -0.272 | -2.59 | 0.123 | 0.018 |
| Constant | 0.701 | 3.62 | – | – |
| Year dummies | | Yes | | |
| State dummies | | No | | |
| $R^2$ | | 0.343 | | |
| Number of observations | | 1,550 | | |

*Source*: Authors' calculations using 1977-2007 CPS.

# Appendix B – *Health and Retirement Study* Analysis

The regression analysis using the *Health and Retirement Study* is based on a sample of older male individuals aged 55-64. Variables describing local labor market conditions are constructed using the *Current Population Survey* (see the list of variables in Table A1). Variables describing demographic, financial, and work characteristics are defined the following way:

- Age – age at the time of the interview.
- College – 1 if a respondent has a college degree or higher and 0 otherwise.
- Nonwhite – 1 if a respondent reports being nonwhite and 0 otherwise.
- Poor/fair health – 1 if a respondent reports having poor/fair health and 0 otherwise.
- Married – 1 if a respondent reports being married and 0 otherwise.
- Spouse working – 1 if a spouse works and 0 otherwise or if a respondent is single.
- Spouse has poor/fair health – 1 if spouse reports having poor/fair health and 0 otherwise or if a respondent is single.
- Spouse's earnings – earnings measured in $10,000 in 1992 dollars reported by a spouse in income section of the survey and 0 if spouse is not working or a respondent is single.
- Homeowner – a respondent reports having a house.
- Financial wealth – measured in $10,000 in 1992 dollars, includes IRA balances.

Table B1. Summary Statistics for Work Equation for Men Aged 55-64, HRS, 1992-2004

| Variables | Mean | SD |
|---|---|---|
| *Individual characteristics* | | |
| Age | 59.51 | 2.82 |
| College education | 0.23 | 0.42 |
| Nonwhite | 0.18 | 0.38 |
| Poor/fair health | 0.24 | 0.43 |
| Married | 0.84 | 0.37 |
| Spouse working | 0.49 | 0.50 |
| Spouse has poor/fair health | 0.16 | 0.37 |
| Spouse's earnings ($10,000) – median for non-zero earnings | 1.68 | 1.96 |
| Homeowner | 0.92 | 0.28 |
| Financial wealth ($10,000) – median | 2.11 | 52.85 |
| Financial wealth squared ($10^4) | 0.29 | 17.67 |
| *State characteristics* | | |
| Pseudo replacement rate | 0.59 | 0.10 |
| Unemployment rate | 0.06 | 0.02 |
| Percent of jobs in self employment | 0.13 | 0.02 |
| Percent of jobs in manufacturing | 0.20 | 0.07 |
| Percent of men 55-64 with college degree | 0.26 | 0.07 |
| Percent of men 55-64 | 0.12 | 0.01 |
| Number of observations | 20,681 | |

*Note:* The sample for the work equation includes men aged 55-64 observed in Waves 1-7. The expected retirement age equation has a sample of men aged 55-64 who were observed and who reported an expected retirement age for the first time in Waves 1-7.
*Source*: Authors' calculations using 1992-2004 HRS.

Table B2. Factors that Affect the Probability of Working for Men Aged 55-64, HRS, 1992-2004

| Variables | State characteristics | | Individual characteristics | | State and individual characteristics | |
|---|---|---|---|---|---|---|
| | dF/dx | *z* | dF/dx | *z* | dF/dx | *z* |
| *Individual characteristics* | | | | | | |
| Age | – | – | -0.038 | -31.15 | -0.039 | -30.16 |
| College education | – | – | 0.071 | 8.26 | 0.068 | 7.81 |
| Nonwhite | – | – | -0.029 | -3.15 | -0.029 | -3.16 |
| Poor/fair health | – | – | -0.330 | -38.91 | -0.330 | -38.33 |
| Married | – | – | 0.035 | 3.21 | 0.036 | 3.31 |
| Spouse working | – | – | 0.130 | 15.11 | 0.127 | 14.93 |
| Spouse has poor/fair health | – | – | 0.019 | 1.91 | 0.018 | 1.83 |
| Spouse's earnings ($10,000) | – | – | -0.006 | -2.55 | -0.006 | -2.54 |
| Homeowner | – | – | 0.080 | 6.08 | 0.081 | 6.23 |
| Financial wealth ($10,000) | – | – | -0.001 | -6.36 | -0.001 | -6.60 |
| Financial wealth squared ($10^4) | – | – | 0.030 | 4.26 | 0.031 | 4.69 |
| *State characteristics* | | | | | | |
| Pseudo replacement rate | -0.072 | -1.83 | – | – | -0.080 | -1.96 |
| Unemployment rate | -1.912 | -6.14 | – | – | -1.650 | -5.05 |
| Percent of jobs in self employment | 0.583 | 3.66 | – | – | 0.383 | 2.30 |
| Percent of jobs in manufacturing | -0.065 | -1.07 | – | – | -0.134 | -2.07 |
| Percent of men 55-64 with college degree | 0.206 | 3.44 | – | – | 0.051 | 0.82 |
| Percent of men 55-64 | -0.832 | -3.20 | – | – | -1.011 | -4.10 |
| Year dummies | | | Yes | | | |
| Number of observations | | | 20,681 | | | |
| Pseudo $R^2$/$R^2$ | 0.005 | | 0.140 | | 0.143 | |

*Note:* The sample for the work equation includes men aged 55-64 observed in Waves 1-7.
*Source*: Authors' calculations using 1992-2004 HRS.

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