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Abstract

This paper examined how the earnings test affects the hours and employment of men who claim early benefits. It uses 1982-2016 data from the *Current Population Survey* and 1992-2014 data from the *Health and Retirement Study*. Critical components of the analysis include the idea that for any fixed earnings-test threshold amount, an increase in the hourly wage at which a beneficiary can work reduces the number of hours needed annually to hit the threshold. This feature of the test and substantial state-by-calendar year variation from increases in the minimum wage, which lower the threshold level of hours at which the earnings test binds, are used to identify the impact of the test on labor supply on the intensive and extensive margins for men who claim early.

The paper found that:

- A substantial proportion of 62- to 64-year-old men report rigidities in their choice of hours, which implies that the earnings test may have asymmetric impacts on labor supply around full-time, full-year hours.
- When the minimum wage increases and pushes threshold hours below full-time, full-year hours, the likelihood of working full-time, full-year falls by 30 percentage points; when the minimum wage decreases and pushes threshold hours above full-time, full-year hours, the likelihood of working full-time, full-year rises by 20 percentage points.
- There are similar asymmetric effects around full-time, full-year hours for annual hours and employment, respectively.

The policy implications of the findings are:

- There are large impacts of the earnings test on the work decisions of beneficiaries under the Full Benefit Age.
- Increases in the minimum wage result in a decline in work among beneficiaries under the Full Benefit Age.

Introduction

The Social Security earnings test determines how work affects the time path of payments to beneficiaries. For annual earnings above a threshold amount, benefits are clawed back. Although the benefit reductions are returned, with an actuarial adjustment, in future years, the test is widely viewed as a pure tax on earnings.[1] For this reason, there has been longstanding interest in the extent to which the Social Security earnings test affects the labor supply of Social Security beneficiaries.

The Senior Citizens Freedom to Work Act of 2000 abolished the test for individuals who are at or above the Full Benefit Age (FBA), traditionally 65, but currently 67. This policy generated a series of studies on the impact of the change on labor supply and earnings for those 65 and older (Song and Manchester, 2007; Haider and Loughran, 2008; Engelhardt and Kumar, 2009; Gelber, Jones, and Sacks, 2013; among others). Overall, these studies found that the repeal of the test increased earnings by 8-20 percent and annual hours of work by 5-16 percent for men over the FBA, with comparable estimates for earnings for women claiming on their own earnings histories (Engelhardt and Kumar, 2014). In contrast, there has been little empirical work done on individuals under the FBA, primarily because there is no policy variation at the federal level that differentially affects individuals who claim early. In this paper, we present new evidence on the impact of the earnings test on men who have claimed benefits early by exploiting variation in the threshold number of annual hours at which the test just binds, induced by state and federal changes in the real value of the effective minimum wage.

We make three primary contributions to the literature. First, we use data from 1982-2016 from the *Current Population Survey* (CPS) and 1992-2014 from the *Health and Retirement Study* (HRS) to document that a large fraction of men who claim early and continue to work have hourly wages close to the minimum wage. Second, for any fixed earnings-test threshold amount, an increase in the hourly wage at which a beneficiary can work reduces the number of annual hours needed to hit the threshold. Hence, labor-market policies that target hourly wages may interact with the structure of the earnings test to affect equilibrium hours and employment

[1] It is unclear the extent to which older Americans understand, in principle, that lost benefits may be returned in the future. For example, Gruber and Orszag (2003) and Figinski (2012) have argued that tax-preparation guides for the public view the test as a pure tax. In addition, Liebman and Luttmer (2011) found that while 62 percent respondents in their survey of Social Security knowledge were generally aware of the earnings test, just 39 percent knew that lost benefits are fully returned to beneficiaries with an actuarial adjustment. The earnings test as a pure tax becomes a better first-order approximation, the less aware the public is of this feature.

for beneficiaries. Third, we exploit this feature of the test and use substantial state-by-calendar year variation in the real effective minimum wage—the higher of the state and federal minima—from increases in the minimum wage, which lower the threshold level of hours at which the earnings test binds, to identify the impact of the test on labor supply on the intensive and extensive margins for men who claim early.

Finally, most studies analyze the earnings test for an individual beneficiary under a standard static unitary labor supply model, with a linear budget set, and no saving. In this framework, individuals can smoothly alter their labor supply—there are no adjustment costs and no labor-market rigidities. However, we present evidence from the HRS that a substantial proportion of 62- to 64-year old men report rigidities in their choice of hours, which implies that the earnings test may have asymmetric impacts on labor supply, especially around full-time, full-year hours. We then present empirical evidence to support this view. When the minimum wage increases and pushes threshold hours below full-time, full-year hours, the likelihood of working full-time, full-year falls by 30 percentage points; when the minimum wage decreases and pushes threshold hours above full-time, full-year hours, the likelihood of working full-time, full-year rises by 20 percentage points. There are similar asymmetric effects around full-time, full-year hours for annual hours and employment, respectively.

Overall, the estimates imply economically large impacts of the earnings test on the hours and employment for men who claim Social Security benefits early. We temper this conclusion with the following caveat: although economically meaningful, the estimated impacts are in some cases imprecise enough that firm conclusions cannot be drawn, especially when we use men of a similar age who have not claimed benefits, and thus are not subject to the earnings test, as a comparison group. In this dimension, our study is somewhat underpowered, and some of our results bear further investigation.

The paper is organized as follows. The next section presents background on the earnings test. Section 3 lays out the basic theoretical framework. Section 4 describes the data and gives preliminary empirical results. Sections 5 and 6 outline the regression framework, estimates, and robustness checks. There is a brief conclusion.

Background

Three key parameters determine the impact of the earnings test on the labor-leisure tradeoff for Social Security beneficiaries. The first is the earnings-test threshold amount, T. For annual earnings above the threshold, benefits paid are clawed back. The second is the benefit-reduction rate, τ, which is the claw-back rate. The third is age. Currently, the test applies only to individuals who have claimed benefits prior to the FBA. Table 1 shows the FBA for the 1918-1954 birth cohorts, which appear in the empirical analysis below. The FBA was 65 for those born 1937 and earlier, and rose by two months for every year of birth from 1938-1942. For the remaining cohorts, the FBA is 66.

Table 2 shows the relevant values for the earnings-test parameters for 1982-2016, which is the range of calendar years represented in the empirical analysis below. The test applies to three separate groups that are delineated by the beneficiary's age relative to the FBA. The first group is composed of beneficiaries who will not reach the FBA during the calendar year, the parameters for which are shown in columns 1-3. This group is comprised overwhelmingly of 62-64 year old beneficiaries. For this group, there has been little policy variation at the national level. The benefit reduction rate has remained the same across years, while the nominal threshold amount has risen. The dashed line in Figure 1 shows the real value of the threshold, using the all-items CPI as the deflator. There has been some time-series variation in the real threshold, but that may be of limited value in identifying the impact of the earnings test, since other time-series changes affecting the labor market for older workers over the last three decades might confound this variation.

The second group in Table 2 are beneficiaries who have attained the FBA for the full calendar year, the parameters for which are shown in columns 4-6. This group is comprised overwhelmingly of 66-69 year old beneficiaries. For this group, there has been significant policy variation. The Senior Citizens Freedom to Work Act of 2000 abolished the test for individuals who are at or above the Full Benefit Age (FBA), traditionally 65, but currently 67. This generated a series of studies on the impact of the law change on labor supply and earnings for those 65 and older (Song and Manchester, 2007; Haider and Loughran, 2008; Engelhardt and Kumar, 2009; Figinski, 2012; Gelber, Jones, and Sacks, 2013). Overall, these studies found that the repeal of the test increased earnings by 8-20 percent and annual hours by 5-16 percent for

men over the FBA, with comparable estimates for earnings for women claiming on their own earnings histories (Engelhardt and Kumar, 2014).

The final group is beneficiaries who will have attained the FBA partway through a calendar year. Special rules apply for this transitional year, the parameters for which are shown in columns 7-9. Since the earnings test applies to this group for only part of a year, there has been little written on this aspect of the test.

Our empirical analysis focuses on the first group, 62-64 year old beneficiaries. Although this is the largest group of beneficiaries for whom the earnings test applies, there has been little useful policy variation at the national level and, therefore, little credible empirical evidence on the impact of the test for this group. Our central contribution is to make a new measure of the bindingness of the earnings test for this group. This measure uses the minimum wage to anchor the minimum number of hours of labor supply at which the threshold earnings are attained and the test just binds. When the minimum wage rises (falls), minimum hours fall (rise), making the test more (less) binding.

Theoretical Framework

To illustrate the basic effects of a change in the minimum wage, we follow the previous literature and view the test as a pure tax on earnings. In particular, Figure 2 shows the earnings test in the standard static unitary labor supply model for an individual who has claimed Social Security benefits prior to the FBA, earns at the minimum wage, $w^{\min}$, and faces no other taxes. Let b and y denote annual benefits and other income, respectively. $\overline{L}$ is the leisure endowment, so that hours of labor supplied are $h = \overline{L} - L$. At the minimum wage, the minimum annual hours required to hit the threshold amount are

$$h^{\min} = T / w^{\min} \tag{1}$$

Therefore, $\overline{L} - h^{\min}$ in the figure represents leisure associated with earning the threshold amount.

The solid budget line in the figure represents consumption (C) and leisure (L) opportunities under the earnings test. The individual can remain out of the labor force at point D and consume the leisure endowment, can work at the minimum wage for hours between 0 ($\overline{L}$)

and $h^{\min}$ ($\bar{L} - h^{\min}$), after which benefits are clawed back at rate τ and the after-tax hourly wage falls to $(1-\tau)w^{\min}$ starting at the kink point A.

The long-dashed budget line shows the impact of an increase in the minimum wage to $w^{\min'}$, holding labor demand fixed. When this occurs, the interior kink shifts to the right to B. The individual can remain out of the labor force, can work at the higher minimum wage for fewer hours between 0 ($\bar{L}$) and $h^{\min'}$ ($\bar{L} - h^{\min'}$), before hitting the earnings test threshold, after which benefits are clawed back at rate τ and the after-tax hourly wage falls to $(1-\tau)w^{\min'}$ starting at B. Therefore, the increase in the minimum wage shifts the kink and induces a mixture of income and substitution effects to the left and right of the kink.

The key insight we exploit in the empirical analysis is that the minimum wage and the earnings test threshold interact to alter the labor-leisure tradeoff: as the minimum wage rises (falls), the threshold number of hours falls (rises), and the location of the interior kink changes. Therefore, to the extent that individuals bunch at the kinks, reduced-form empirical analysis of the impact of the minimum wage on labor supply will measure the uncompensated labor supply response to these changes in kinks.[2]

Data and Preliminary Analysis

The primary data are for 64-year old male beneficiaries from the 1983-2017 waves of the IPUMS March CPS ASEC supplement (Ruggles et al., 2017). These individuals were born between 1918 and 54. We focus on men, because most men in these birth cohorts claimed on their own earnings histories, which simplifies the analysis. Although women are an understudied group in the earnings-test literature, we leave the analysis of their responses to future research.

The main advantage of the CPS is that it provides large samples of older individuals, but it presents three measurement challenges. First, the CPS does not provide the birth month in the public-use data, so we do not know ages exactly. This means that we neither are able to calculate the FBA for each individual, nor determine precisely who is eligible to claim early

[2] This contrasts with the impact of the abolition of the earnings test, the subject of the recent empirical literature on the impact of the 2000 Act. The short-dashed budget line in the figure, which includes the segment from A to D, depicts the opportunities when the earnings test is abolished. For those earning above the threshold (to the left of $\bar{L} - h^{\min}$, the abolition induces both income and substitution effects on labor supply.

benefits. Consequently, we cannot reliably include 62- and 65-year olds in the analysis sample, because we cannot be sure they faced the earnings test for the calendar year for which income and hours are measured. Second, for those reporting Social Security benefit receipt, there is no information on the age at which benefits were claimed. Third, the March supplement asks about annual income and hours in the previous calendar year. We use the income questions on receipt of Social Security benefits to determine beneficiary status and, hence, who faces the earnings test. Roughly ten-twelfths of 64-year olds interviewed in March were 63-year olds in the previous calendar year, for which they reported their income and hours. The other two-twelfths turned 64 in January or February (or even in early March), just before the March interview, and hence, would have been 62-year olds in the previous calendar year that references the income and hours data. Due to this wedge in the timing of the income and hours information and the date of the interview, we focus on 64-year olds to ensure that the income and hours data apply to individuals who would have been subject to the earnings test.[3]

Overall, the analysis sample consists of 22,310 64-year old men from the 1983-2017 March CPS. Their annual income and hours cover the 1982-2016 calendar years. Table 3 provides summary descriptive statistics for the full sample and the subsamples of Social Security beneficiaries and non-beneficiaries.

To supplement the analysis, we also in places draw on data from the 1982-2016 monthly CPS Merged Outgoing Rotation Groups (MORG) from the NBER and the 1992-2014 waves of the HRS. The primary advantage of the MORG data is that it provides significantly larger samples of individuals than the annual supplement to the March CPS; the primary disadvantage is that the MORG data do not include enough information to construct measures of annual income and hours. The primary advantages of the HRS are exact months and years of birth and claiming, respectively, and detailed information on hourly wages and hours' constraints on the job. The main drawback of the HRS is that it generates small samples relative to the CPS.

In order for changes in the minimum wage to identify meaningful labor-supply effects for early claimants, there are three necessary conditions. First, there has to be substantial bunching at the interior kink point. Previous studies have documented substantial bunching of earnings and hours associated with the earnings test threshold (e.g., Friedberg, 2000; Haider and

[3] By the same reasoning, 63-year olds were excluded from the sample, because most, if not all, of them would have been 62 or even 61 for the previous calendar referencing their income and hours.

Loughran, 2008; Engelhardt and Kumar, 2009; Gelber, Jones, Sacks, 2013; among others). Figure 3a is a histogram of the fraction of 64-year old male beneficiaries pooled from 1982-2016 in the March CPS by the ratio of their annual earnings to the earnings test threshold. The vertical dashed line denotes a value of 1, where earnings equal the threshold amount; each bin is 0.1 wide. There is a large spike in the distribution just to the left of 1, indicating substantial bunching at the interior kink. There is no such bunching in Figure 3b for men who are not beneficiaries and not subject to the earnings test. Figures 4a and 4b show similar results for 62 to 64 year old men pooled from the 1992-2014 waves of the HRS.[4]

Second, there must be substantial variation in minimum hours, $h^{\min}$. The solid line in Figure 1 shows the aggregate national time series of the real value of the effective minimum wage from 1982-2016, defined as the higher of the state and federal minima. The series was constructed using the monthly CPS MORG data from 1982-2016. For each state and month, the higher of the applicable nominal state and federal minimum wage rates was assigned to each ORG respondent. These minimum wages were then inflated into real 2016 dollars using the monthly all-items Consumer Price Index (CPI), and then the real wage data were weighted by the CPS sampling weight and collapsed into annual data. Therefore, the series in the figure represents the state-employment-weighted annual average national real minimum wage.

The real minimum wage follows a saw-toothed pattern that results from increases in the federal minimum wage in the 1990s, slowly eroded by inflation, and increases in state minimum wages that went into effect for some states and occurred primarily after the 1990s. Overall, there is significant state-by-year variation in the effective minimum wage that underlies the series. Using this series, the real threshold series in Figure 1, and equation (1), the dashed line in Figure 5 shows the annual time series for minimum hours, $h^{\min}$. There is substantial variation in minimum hours across years that varies inversely with the real minimum wage (the solid line in the figure). Up until 2000, a beneficiary had to work 1400-1800 hours at the minimum wage to hit the earnings-test threshold; higher-wage workers needed even fewer hours. After 2000, closer to full-time, full-year hours (2080 hours) were needed to hit the threshold at the minimum wage.

[4] Because the exact months and years of birth and claiming are known for the HRS, we include observations on 62- and 63-years olds in the HRS figures.

Finally, changes in the minimum wage must affect a substantial share of working beneficiaries. Figure 6a is a histogram of the fraction of 62- to 64-year old male beneficiaries pooled from 1992-2014 waves of the HRS by the ratio of their hourly wage to the minimum wage. The vertical dashed line denotes a value of 1, where the hourly and minimum wages are equal. There is a large spike in the distribution just to the right of 1. There is no such bunching in Figure 6b for men who are not beneficiaries. Overall, about 40 percent of 62- to 64-year old male working beneficiaries have hourly wages within 150 percent of the minimum wage. Furthermore, for 1982-2016, Figure 7 uses data from the CPS MORG and shows a strong positive time-series correlation between the minimum wage and the percent of all 62- to 64-year old working men (regardless of beneficiary status) who earn at or below 150 percent of the minimum wage. Overall, these figures indicate that a large fraction of working beneficiaries earn at or just above the minimum wage, and will be affected by changes in the minimum wage directly or through spillovers to wages above the minimum (Lee, 1999; Autor, Manning, and Smith, 2016; Engelhardt and Purcell, 2018).

Figures 8 and 9 show the time-series relationship between minimum hours, $h^{\min}$, and the three labor-supply measures used below. In Figure 8, the solid line shows minimum hours, measured on the right-hand vertical axis, and the short-dashed line shows annual hours for beneficiaries, measured on the left-hand axis. To fit all series to the appropriate scale on the figure, annual hours are divided by the 1982 value to convert to an index with a value of 1 in 1982. Overall, there is a positive correlation between minimum hours and the annual hours of beneficiaries $(\hat{\rho} = 0.36)$, especially since the early 1990s. The long-dashed line in the figure is an index for the annual hours of non-beneficiaries, who did not face the earnings test. Their hours are relatively flat across years and are less correlated with minimum hours $(\hat{\rho} = 0.24)$. Figure 9 shows the relationship for the share of men out of the labor force. There is a positive correlation $(\hat{\rho} = 0.55)$ between minimum hours and labor force participation for beneficiaries, but not for non-beneficiaries $(\hat{\rho} = -0.005)$, suggesting that changes in threshold hours may have had extensive-margin impacts.

Regression Specification and Estimation Results

To capture the basic theoretical mechanism, we begin with the following reduced-form regression specification:

$$h_{ist} = \alpha + \beta w_{st}^{\min} + \gamma h_{st}^{\min} + \boldsymbol{\psi}\mathbf{X}_{ist} + \xi_s + \zeta_t + \kappa_{st} + u_{ist} \ , \tag{2}$$

where the dependent variable measures the labor supply (e.g., hours) of individual i in state s in calendar year t. The focal explanatory variable is $h^{\min}$, defined in (1), which is the kink point expressed in hours—it is the minimum number of hours required to hit the earnings-test threshold amount if the hourly wage equals the effective minimum wage in that state and year. There are additional controls for the minimum wage itself, a vector of demographic characteristics (**X**), state effects (ξ), calendar-year effects (ζ), and a state-by-year linear trend (κ); u is the error term. The central objective is to obtain consistent estimates of γ, which measures the change in the labor-supply outcome when the kink point changes. Statistically speaking, the estimate of γ is identified by state-by-year variation in the effective minimum wage from state- (and their interaction with federal-) level changes in minimum wages, which enters $h^{\min}$ non-linearly in the denominator.

The first row of column 1 of Table 4 shows the probit estimates of the parameters in (2) for the sample of beneficiaries, when the dependent variable measures the extensive margin: an indicator for whether the beneficiary worked for pay at any point during the year. Since the identifying variation is state-by-year, the standard errors clustered at the state level are shown in parentheses. The marginal effect of a 260-hour increase in minimum hours—roughly one standard deviation, based on the summary statistics in the first row of Table 3—is shown in square brackets. This base specification excludes the demographic variables (**X**) in (2). The estimated marginal effect of an increase in minimum hours is to raise the likelihood of working by 14.3 percentage points. This impact is statistically different than zero at the 7 percent level of significance and is economically large relative to the mean share working of 28.5 percent. Column 3 extends the specification by adding controls for demographics. Since the identifying variation is state-by-year, Column 5 extends the specification by adding controls for state labor-market conditions that vary across time, which might be potential confounders: the state

unemployment rate and controls for the 25th, 50th, 75th, and 90th percentiles of the state's real hourly wage distribution for prime-age men calculated for each state and year from the CPS MORG data. The estimates in columns 3 and 5 are very similar in magnitude to the base estimates in column 1—both are significant at the 7 percent level. Overall, the estimates in columns 1, 3, and 5 indicate that the earnings test has an important impact on equilibrium employment of 64-year old beneficiaries.

Columns 2, 4, and 6 in Table 4 show a parallel set of estimates for 64-year men who were not beneficiaries. These men are not subject to the earnings test and potentially serve as a control group to the extent they are similar to beneficiaries in terms of observable and unobservable characteristics. Comparing columns 2 and 3 in Table 3, beneficiaries and non-beneficiaries are similar along observed characteristics, with two exceptions: non-beneficiaries are less likely to be veterans and more likely to be college educated. Across columns 2, 4, and 6 in Table 4, changes in minimum hours have little impact on the likelihood of employment for non-beneficiaries. The estimated marginal effects are economically small and not statistically different than zero at conventional significance levels. The second row in the table shows the *p*-value for the test of the null hypothesis that the parameter estimates for minimum hours are equal across the beneficiary and non-beneficiary samples. Unfortunately, the estimates are somewhat underpowered: even though the point estimates differ across samples, those differences are not statistically different from each other.

Table 5 shows Tobit estimates of the parameters in (2) when the dependent variable is annual hours. The pattern of point estimates is similar to that in Table 4, showing economically large marginal effects of changes in minimum hours on annual hours for beneficiaries, but not for non-beneficiaries. However, none of these differences are statistically significant at conventional levels of significance.

Extensions and Robustness Checks

Overall, the baseline estimates in Tables 4 and 5 are suggestive of important impacts on equilibrium hours and employment, but not conclusive. In this section, we extend the analysis and provide an important robustness check.

Although the labor-supply framework illustrated in Figure 2 has been the basis for essentially all of the last two decades' literature on the earnings test, one of its limitations is the

assumption that individuals can smoothly adjust their hours when incentives change. There is a long literature in labor economics that examines constraints in hours, for example, Altonji and Paxson (1988), Cogan (1981), Card (1990), Gustman and Steinmeier (2004), and Hurd (1996), among others. If hours are constrained, then portions of the budget sets in Figure 2 may not be available. As a hypothetical, Figure 10 illustrates the budget sets in Figure 2, subject to two constraints: hours can be adjusted above, but not below full-time hours; hours choices between part-time and full-time hours are not available. Now, when the minimum wage rises and minimum hours fall, the kink at B is no longer available. In this type of scenario, changes in the minimum hours may induce large changes in labor supply, up to full-time, full-year hours, or down to part-time or even no hours, depending on the size of the change in minimum hours, what sections of the budget set are available, and how close minimum hours are to full-time, full-year hours. In particular, in the presence of constraints on hours, there may be significant asymmetry in the impact of changes in minimum hours on annual hours and employment as minimum hours rises (falls) above (below) full-time, full-year hours.

To gauge the importance of hours' constraints, the first two rows and columns (panel A) in Table 6 represent a two-way tabulation of the percentage of 62- to 64-year old working men in the HRS by their self-reported ability to increase and decrease their hours in their regular work schedule on their current job. Almost 63 percent reported they could neither increase not decrease hours, and just under 84 percent reported some constraint on hours. Panel C shows that working beneficiaries are somewhat less, but still substantially constrained in their choice of hours. Constraints on hours are even stronger for workers in full-time, full-year positions (columns 3 and 4). Overall, the table suggests that hours' constraints may be an important factor.

To examine asymmetries in response to change in minimum hours, Table 7 presents estimates for a more flexible regression specification:

$$h_{ist} = \alpha + \beta w_{st}^{\min} + \delta h_{st}^{\min+} + \theta h_{st}^{\min-} + \boldsymbol{\psi}\mathbf{X}_{ist} + \xi_s + \zeta_t + \kappa_{st} + u_{ist} \ , \tag{3}$$

where

$$h_{st}^{\min+} = \max(h_{st}^{\min} - 2080, 0) \tag{4}$$

and

$$h_{st}^{\min-} = \max(2080 - h_{st}^{\min}, 0) \tag{5}$$

In this specification, γ in (2) is allowed to vary depending on whether minimum hours are above ($h^{\min+} > 0$) or below ($h^{\min-} > 0$) full-time, full-year hours. Under the null of symmetry, $\delta = \theta$; under the alternative of asymmetry, $\delta > 0$ and $\theta < 0$. In particular, when minimum hours are lower than full-time hours (2080), the earnings test will bind at less than full-time, full-year hours, and individuals may end up working less if hours cannot be smoothly adjusted, hence $\theta < 0$. Conversely, when minimum hours are higher than full-time, full-year hours, then the earnings test will not bind at full-time work, and labor supply should be higher on average, hence $\delta > 0$.

There is significant asymmetry cross labor-supply measures in the table. Both the likelihood of employment (column 1), annual hours (column 3), and the likelihood of full-time, full-year work (column 5) are significantly higher when minimum hours exceed full-time, full-year hours and the earnings test is not binding for full-time work, and significantly lower when minimum hours fall below full-time, full-year hours and the earnings test is binding for full-time work. In all three columns, the null of symmetry can be rejected in favor of asymmetry at conventional levels of significance based on the *p*-values shown in the fifth row of the table. Columns 2, 4, and 6 show estimates for the isomorphic specifications for the sample of non-beneficiaries. While there is little evidence of asymmetry within these samples, the *p*-values for the tests of equal impact across samples (in rows 2 and 4) continue to show that the analysis is somewhat underpowered: the differences in parameter estimates across samples, though economically large, are not statistically significant at conventional levels.

An important maintained assumption throughout the empirical analysis is that the sample of beneficiaries is exogenous and that the timing benefit claiming is not correlated with changes in minimum hours. In particular, Gruber and Orszag (2003) found that claiming increased when the test was less binding. To address this, we show in column 1 of Table 8 the estimates from a Cox proportional hazard model:

$$\lambda_{ist} = \lambda_{0t}\, e^{\mathbf{Z}'_{ist}\boldsymbol{\beta}}, \tag{6}$$

where i indexes individuals, λ, the hazard, measures the probability of claiming benefits in period t conditional on not having yet claimed, $t = 1,...,\tau$, and λ_0 is the baseline hazard. In (6),

$$\mathbf{Z}'_{ist}\boldsymbol{\beta} = \alpha + \beta w_{st}^{\min} + \gamma h_{st}^{\min} + \boldsymbol{\psi}\mathbf{X}_{ist} + \mu T_{it} + \xi_s + \zeta_t + \kappa_{st} \ , \tag{7}$$

and the parameters are estimated on panel data on 62-year old men from the HRS, who are followed until they claim benefits.[5] Importantly, in this hazard framework, a test of the null hypothesis that $\gamma = 1$ is a test of the null that claiming is uncorrelated with changes in minimum hours. The first row shows the estimate of γ, with the standard error in parentheses, and the marginal effect, measured as

$$[\exp(\hat{\theta} \cdot \overline{h^{\min}}) - 1] - [\exp(\hat{\theta} \cdot (\overline{h^{\min}} + 260)) - 1] \ , \tag{8}$$

in square brackets, where $\overline{h^{\min}}$ is the sample mean minimum hours, and 260 is the sample standard deviation. So, the marginal effect represents a one-standard-deviation increase in minimum hours above the mean. The estimate in column 1 is not statistically different from 1, based on the standard error, and the estimated marginal effect is economically small. Column 2 shows a parallel set of estimates when breaking minimum hours into its two components above and below full-time, full-year hours. Again, there is no statistically significant correlation between minimum hours and the timing of claiming, lending support to the assumption that the sample of beneficiaries is exogenous.

Discussion and Caveats

In this paper, we examine how the earnings test affects the hours and employment of men who claim early benefits. For any fixed earnings-test threshold amount, an increase in the hourly wage at which a beneficiary can work reduces the number of annual hours needed to hit the threshold. We exploit this feature of the test and use substantial state-by-calendar year variation from increases in the minimum wage, which lower the threshold level of hours at which the

[5] The real value of the threshold *T* is included in this specification, because the spells are not constrained by age. Someone who has not claimed by the time he enters the calendar year in which he attains the FBA, will face a higher threshold (see columns 7-9 of Table 2), and that must be accounted for in the estimation.

earnings test binds, to identify the impact of the test on labor supply on the intensive and extensive margins for men who claim early. We also present evidence from the HRS that a substantial proportion of 62- to 64-year old men report rigidities in their choice of hours, which implies that the earnings test may have asymmetric impacts on labor supply around full-time, full-year hours. Based on data from 1982-2016 from the *Current Population Survey* and 1992-2014 from the *Health and Retirement Study,* we find substantial asymmetries. When the minimum wage increases and pushes threshold hours below full-time, full-year hours, the likelihood of working full-time, full-year falls by 30 percentage points; when the minimum wage decreases and pushes threshold hours above full-time, full-year hours, the likelihood of working full-time, full-year rises by 20 percentage points. There are similar asymmetric effects around full-time, full-year hours for annual hours and employment, respectively. Overall, the estimates imply economically large impacts of the earnings test on the hours and employment for men who claim Social Security benefits early.

These conclusions are tempered by the following caveats. First, the estimates reflect equilibrium effects on hours and employment, because changes in the minimum wage also induce changes in labor demand. To the extent there are disemployment effects from the minimum wage that affect older workers, those effects will be subsumed in our reduced-form estimates. Although we couch our discussion of in terms of labor supply, technically we do not separately identify supply and demand effects. Second, although economically meaningful, the estimated impacts are in some cases imprecise enough that firm conclusions cannot be drawn, especially when we use men of a similar age who have not claimed benefits, and thus are not subject to the earnings test, as a comparison group. In this dimension, our study is somewhat underpowered, and some of our results bear further investigation. Finally, we do not examine the hours and employment response of women. A careful treatment of this important, but relatively underexplored, aspect of the earnings test should be a key focus of future research.

References

Altonji, Joseph G., and Christina H. Paxson, "Labor Supply Preferences, Hours Constraints, and Hours-Wage Trade-Offs." *Journal of Labor Economics* 6 (1988): 254-276.

Autor, David H., Alan Manning, and Christopher L. Smith. 2016. "The Contribution of the Minimum Wage to US Wage Inequality over Three Decades: A Reassessment." *American Economic Journal: Applied Economics* 8(1): 58-99.

Card, David, "Labor Supply with a Minimum Hours Threshold." *Carnegie-Rochester Conference Series on Public Policy* 33 (1990): 137-168.

Cogan, John F., "Fixed Costs and Labor Supply," *Econometrica* 49 (1981): 945-963.

Engelhardt, Gary V., and Anil Kumar, "The Repeal of the Retirement Earnings Test and the Labor Supply of Older Men." *Journal of Pension Economics and Finance* 8 (2009): 429-450.

Engelhardt, Gary V., and Anil Kumar, "Taxes and the Labor Supply of Older Americans: Recent Evidence from the Social Security Earnings Test." *National Tax Journal.* 67 (2014): 429-450.

Engelhardt, Gary V., and Patrick J. Purcell, "The Minimum Wage and Annual Earnings Inequality." Unpublished manuscript. Syracuse University, Syracuse, NY, 2018.

Figinski, Theodore F., "Women and the Social Security Earnings Test." Unpublished manuscript. University of California-Irvine, Irvine, CA, 2012.

Friedberg, Leora, "The Labor Supply Effects of the Social Security Earnings Test." *Review of Economics and Statistics* 82:1 (2000): 48-63.

Gelber, Alexander M., Damon Jones, and Daniel W. Sacks, 2013. "Earnings Adjustment Frictions: Evidence from the Social Security Earnings Test." NBER Working Paper No. 19491. National Bureau of Economic Research, Cambridge, MA.

Gruber, Jonathan, and Peter Orszag, "Does the Social Security Earnings Test Affect Labor Supply and Benefits Receipt?" *National Tax Journal* 56:4 (2003): 755-773.

Gustman, Alan L., and Thomas L. Steinmeier, "The Social Security Retirement Earnings Test, Retirement and Benefit Claiming." NBER Working Paper No. 10905, 2004.

Haider, Steven J., and David S. Loughran, "The Effect of the Social Security Earnings Test on Male Labor Supply: New Evidence from Survey and Administrative Data." *Journal of Human Resources* 43(2008): 57-87.

Hurd, Michael, "The Effect of Labor Market Rigidities on the Labor Force Behavior of Older Workers" in Wise, David (ed.), *Advances in the Economics of Aging* (Chicago: University of Chicago Press) 1996, pp. 11-58.

Lee, David S. 1999. "Wage Inequality in the United States During the 1980s: Rising Dispersion or Falling Minimum Wage?" *Quarterly Journal of Economics* 114 (3): 977-1023.

Liebman, Jeffrey B., and Erzo F.P. Luttmer, "Would People Behave Differently if They Better Understood Social Security? Evidence from a Field Experiment." NBER Working Paper No. 17287. National Bureau of Economic Research, Cambridge, MA, 2011.

Steven Ruggles, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. *Integrated Public Use Microdata Series: Version 7.0* [dataset]. Minneapolis, MN: University of Minnesota, 2017.

Song, Jae G., and Joyce Manchester, "New Evidence on Earnings and Benefit Claims Following Changes in the Retirement Earnings Test in 2000." *Journal of Public Economics* 91 (2007): 669-700.

Table 1. *Full Benefit Age for Individuals Born 1918-54*

Year of Birth	(1) Attain Age 62 in	(2) Full Benefit Age
1918-1937	1982-1999	65 years
1938	2000	65 years, 2 months
1939	2001	65 years, 4 months
1940	2002	65 years, 6 months
1941	2003	65 years, 8 months
1942	2004	65 years, 10 months
1943-54	2005-16	66 years

Table 2. *Key Earnings-Test Features, 1982-2016*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Beneficiaries Who Will Not Reach the Full Benefit Age during the Calendar Year			Beneficiaries Who Have Attained the Full Benefit Age for the Full Calendar Year			Beneficiaries Who Will Reach the Full Benefit Age during the Calendar Year		
Year	Ages in this Group Subject to Test	Nominal Threshold Amount	Benefit Reduction Rate	Ages in this Group Subject to Test	Nominal Threshold Amount	Benefit Reduction Rate	Ages in this Group Subject to Test	Nominal Threshold Amount	Benefit Reduction Rate
1982	All	4,440	50%	Up to 72	6,000	50%	All	4,440	50%
1983	All	4,920	50%	Up to 70	6,600	50%	All	4,920	50%
1984	All	5,160	50%	Up to 70	6,960	50%	All	5,160	50%
1985	All	5,400	50%	Up to 70	7,320	50%	All	5,400	50%
1986	All	5,760	50%	Up to 70	7,800	50%	All	5,760	50%
1987	All	6,000	50%	Up to 70	8,160	50%	All	6,000	50%
1988	All	6,120	50%	Up to 70	8,400	50%	All	6,120	50%
1989	All	6,480	50%	Up to 70	8,880	50%	All	6,480	50%
1990	All	6,840	50%	Up to 70	9,360	33%	All	6,840	50%
1991	All	7,080	50%	Up to 70	9,720	33%	All	7,080	50%
1992	All	7,440	50%	Up to 70	10,200	33%	All	7,440	50%
1993	All	7,680	50%	Up to 70	10,560	33%	All	7,680	50%
1994	All	8,040	50%	Up to 70	11,160	33%	All	8,040	50%
1995	All	8,160	50%	Up to 70	11,280	33%	All	8,160	50%
1996	All	8,280	50%	Up to 70	12,500	33%	All	8,280	50%
1997	All	8,640	50%	Up to 70	13,500	33%	All	8,640	50%
1998	All	9,120	50%	Up to 70	14,500	33%	All	9,120	50%
1999	All	9,600	50%	Up to 70	15,500	33%	All	9,600	50%
2000	All	10,080	50%	None	--	--	All	17,000	33%
2001	All	10,680	50%	None	--	--	All	25,000	33%
2002	All	11,280	50%	None	--	--	All	30,000	33%
2003	All	11,520	50%	None	--	--	All	30,720	33%
2004	All	11,640	50%	None	--	--	All	31,080	33%
2005	All	12,000	50%	None	--	--	All	31,800	33%
2006	All	12,480	50%	None	--	--	All	33,240	33%
2007	All	12,960	50%	None	--	--	All	34,440	33%
2008	All	13,560	50%	None	--	--	All	36,120	33%
2009	All	14,160	50%	None	--	--	All	37,680	33%
2010	All	14,160	50%	None	--	--	All	37,680	33%
2011	All	14,160	50%	None	--	--	All	37,680	33%
2012	All	14,640	50%	None	--	--	All	38,880	33%

2013	All	15,120	50%	None	--	--	All	40.080	33%
2014	All	15,480	50%	None	--	--	All	41,400	33%
2015	All	15,720	50%	None	--	--	All	44,880	33%
2016	All	15,720	50%	None	--	--	All	41,880	33%

Table 3. *Sample Summary Statistics for Men Age 64 from the 1983-2016 March CPS (Standard Deviations in Parentheses)*

	(1)	(2)	(3)
	Sample:		
Explanatory Variable:	All	Beneficiaries	Non-Beneficiaries
h^{min}	1880	1870	1891
	(235)	(237)	(232)
h^{min+}	29	28	29
	(72)	(72)	(72)
h^{min-}	228	238	218
	(192)	(193)	(189)
Share Working	0.531	0.285	0.791
Share Working Full-Time, Full-Year	0.412	0.132	0.708
Annual Hours	952	301	1641
	(1090)	(647)	(1039)
High School Dropout	0.225	0.274	0.172
High School Graduate	0.319	0.353	0.283
Some College	0.199	0.195	0.203
Veteran	0.503	0.550	0.453
Hispanic	0.096	0.087	0.105
Black	0.090	0.093	0.087
White	0.852	0.866	0.836
Divorced/Separated	0.119	0.127	0.109
Widowed	0.041	0.051	0.031
Never Married	0.055	0.053	0.058
State Real Effective Minimum Wage	7.61	7.54	7.69
	(0.73)	(0.70)	(0.76)
25th Percentile State Wage	15.00	14.93	15.09
	(1.93)	(1.92)	(1.93)
50th Percentile State Wage	21.70	21.49	21.92
	(2.88)	(2.84)	(2.90)
75th Percentile State Wage	31.40	30.84	31.99
	(4.57)	(4.38)	(4.70)
90th Percentile State Wage	43.59	42.63	44.61
	(6.80)	(6.57)	(6.90)
State Unemployment Rate	6.27	6.31	6.23
	(2.11)	(2.16)	(2.07)
Number of Observations	22,310	11,473	10,837

Table 4. *Probit Estimates of the Impact of Minimum Hours on Employment for Men Age 64 from the 1983-2016 March CPS (Standard Errors in Parentheses, Marginal Effects in Brackets)*

	(1)	(2)	(3)	(4)	(5)	(6)
	Sample:		Sample:		Sample:	
Explanatory Variable:	Beneficiaries	Non-Beneficiaries	Beneficiaries	Non-Beneficiaries	Beneficiaries	Non-Beneficiaries
h^{min}	0.00162*	-0.00040	0.00164*	0.00011	0.00145*	0.00015
	(0.00092)	(0.00061)	(0.00091)	(0.00070)	(0.00084)	(0.00080)
	[0.143]	[-0.029]	[0.143]	[0.008]	[0.127]	[0.011]
p-Value for Test of Equal Impacts Across Samples	0.109		0.234		0.321	
Share Working	0.285	0.791	0.285	0.791	0.285	0.791
Other Controls						
Minimum Wage	Yes	Yes	Yes	Yes	Yes	Yes
State and Calendar-Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
State Unemployment Rate	No	No	No	No	Yes	Yes
State Wage Structure	No	No	No	No	Yes	Yes

Note: ** denotes statistically different than zero at the 5% level for a two-tailed test; * at the 10% level. Standard errors clustered at the state level shown in parentheses. Marginal effects calculated for a 260-hour change in minimum hours.

Table 5. *Tobit Estimates of the Impact of Minimum Hours on Annual Hours for Men Age 64 from the 1983-2016 March CPS (Standard Errors in Parentheses, Marginal Effects in Brackets)*

	(1)	(2)	(3)	(4)	(5)	(6)
	Sample:		Sample:		Sample:	
Explanatory Variable:	Beneficiaries	Non-Beneficiaries	Beneficiaries	Non-Beneficiaries	Beneficiaries	Non-Beneficiaries
h^{min}	1.750	0.033	1.687	0.385	1.464	0.444
	(1.451)	(0.620)	(1.414)	(0.637)	(1.323)	(0.717)
	[455]	[9]	[438]	[100]	[381]	[115]
p-Value for Test of Equal Impacts Across Samples	0.955		0.697		0.619	
Mean Hours	302	1,642	302	1,642	302	1,642
Mean Hours, Conditional on Working	1,056	2,075	1,056	2,075	1,056	2,075
Other Controls						
Minimum Wage	Yes	Yes	Yes	Yes	Yes	Yes
State and Calendar-Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	Yes	Yes	Yes	Yes
State Unemployment Rate	No	No	No	No	Yes	Yes
State Wage Structure	No	No	No	No	Yes	Yes

Note: ** denotes statistically different than zero at the 5% level for a two-tailed test; * at the 10% level. Standard errors clustered at the state level shown in parentheses. Marginal effects calculated for a 260-hour change in minimum hours.

Table 6. *Percent of 62- to 64-Year Old Working Men Able to Increase and Decrease Hours in Their Regular Work Schedule*

	(1)	(2)	(3)	(4)
	Sample:			
	All Workers:		Full-Time Workers:	
	Able to Decrease Hours in Regular Work Schedule:			
Able to Increase Hours in Regular Work Schedule:	No	Yes	No	Yes
	A. All			
No	62.9	12.1	65.6	12.9
Yes	8.9	16.1	10.0	11.5
	B. All Paid Hourly			
No	61.2	11.3	68.1	10.2
Yes	10.3	17.2	12.6	9.1
	C. Beneficiaries			
No	54.6	13.2	61.1	13.8
Yes	7.4	24.7	8.9	16.3
	D. Beneficiaries Paid Hourly			
No	49.3	14.5	62.0	14.7
Yes	8.7	27.6	12.4	10.9

Note: Authors' tabulations from the *Health and Retirement Study.*

Table 7. *Estimates of the Asymmetric Impact of Minimum Hours on Employment for Men Age 64 from the 1983-2016 March CPS (Standard Errors in Parentheses, Marginal Effects in Brackets)*

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable (Estimator):					
	Dummy if Work (Probit)		Annual Hours (Tobit)		Dummy if Work Full-Time, Full-Year (Probit)	
	Sample:		Sample:		Sample:	
Explanatory Variable:	Beneficiaries	Non-Beneficiaries	Beneficiaries	Non-Beneficiaries	Beneficiaries	Non-Beneficiaries
h^{min+}	0.00251**	0.00049	0.888**	0.437	0.00376**	0.00126
	(0.00117)	(0.00104)	(0.468)	(0.731)	(0.00129)	(0.00101)
	[0.191]	[0.035]	[231]	[114]	[0.202]	[0.111]
p-Value for Test of Equal Impacts Across Samples	0.323		0.560		0.103	
h^{min-}	-0.00333	-0.00087	-1.606*	-415	-0.00562**	-0.00170
	(0.00197)	(0.00158)	(0.836)	(1.123)	(0.00216)	(0.00164)
	[-0.249]	[-0.062]	[-418]	[-108]	[-0.301]	[-0.148]
p-Value for Test of Equal Impacts Across Samples	0.455		0.315		0.106	
p-Value for Test of Symmetry of Impact of Minimum Hours Above and Below Full-Time, Full-Year Hours	0.085	0.599	0.052	0.641	0.005	0.259
Dependent Variable Mean	0.285	0.791	302	1,642	0.132	0.708
Other Controls						
Minimum Wage	Yes	Yes	Yes	Yes	Yes	Yes
State and Calendar-Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
State Unemployment Rate	Yes	Yes	Yes	Yes	Yes	Yes
State Wage Structure	Yes	Yes	Yes	Yes	Yes	Yes

Note: ** denotes statistically different from zero at the 5% level for a two-tailed test; * at the 10% level. Standard errors clustered at the state level shown in parentheses. Marginal effects calculated for a 260-hour change in minimum hours.

Table 8. *Cox Proportional Hazard Estimates of the Impact of Minimum Hours on Likelihood of Claiming for Men from the 1992-2014 Waves of the HRS (Standard Errors in Parentheses, Marginal Effects in Brackets)*

	(1)	(2)
Explanatory Variable:		
h^{min}	0.997 (0.0008) [-0.035]	---
h^{min+}	---	0.998 (0.00019) [-0.0080]
h^{min-}	---	1.0005 (0.00016) [0.0082]
Other Controls		
Minimum Wage	Yes	Yes
Real Threshold	Yes	Yes
State and Calendar-Year Effects	Yes	Yes
Demographics	Yes	Yes
State Unemployment Rate	Yes	Yes
State Wage Structure	Yes	Yes

Note: Marginal effects calculated for a 260-hour change in minimum hours.

Figure 1. The Real Minimum Wage and Earnings Test Threshold for 1983-2016

Figure 2. *The Labor-Supply Impact of an Increase in the Minimum Wage Under the Earnings Test*

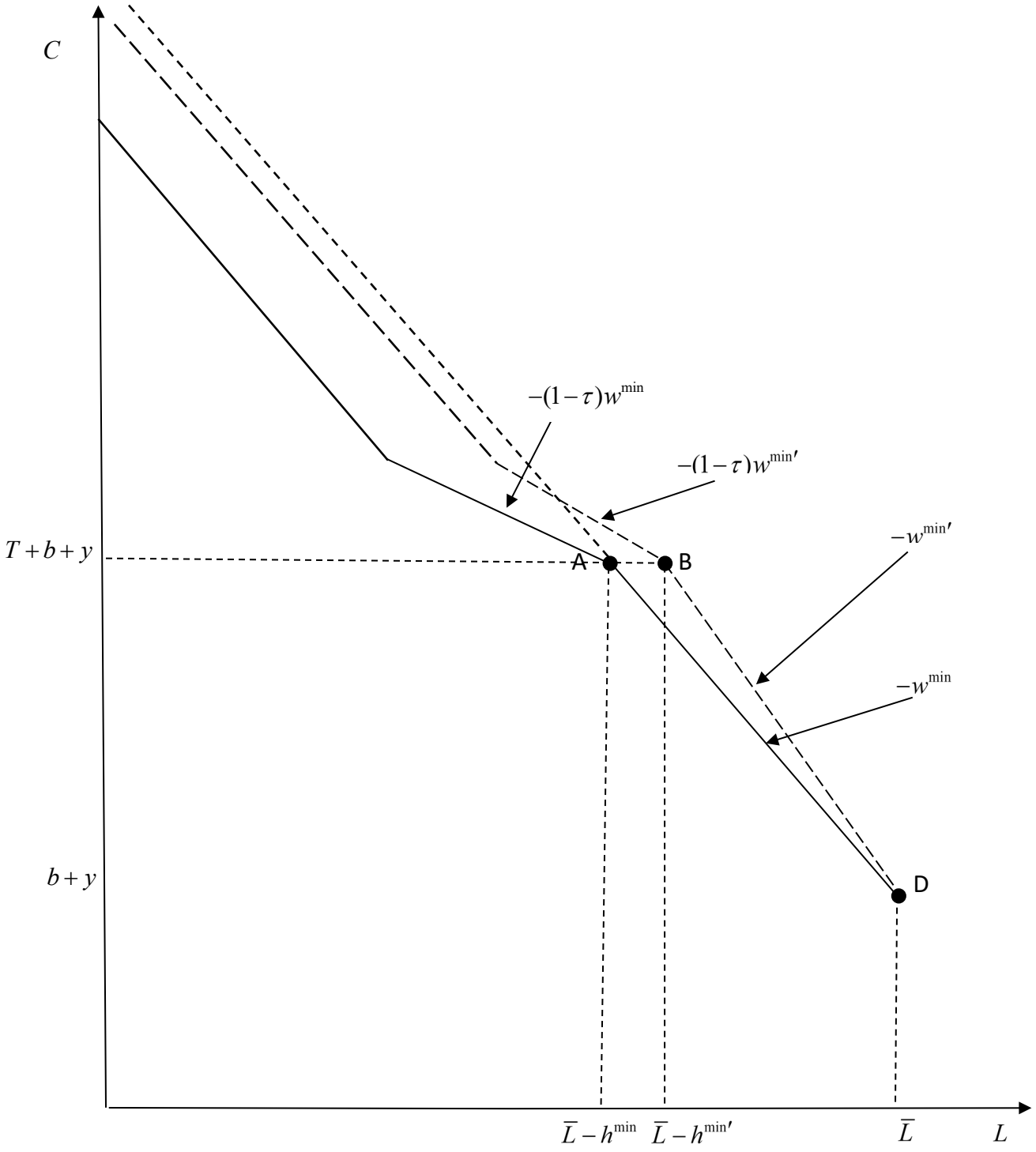


Figure 3a. Fraction of Male Beneficiaries Age 64 in the CPS by the Ratio of Annual Earnings to the Earnings Test Threshold Amount

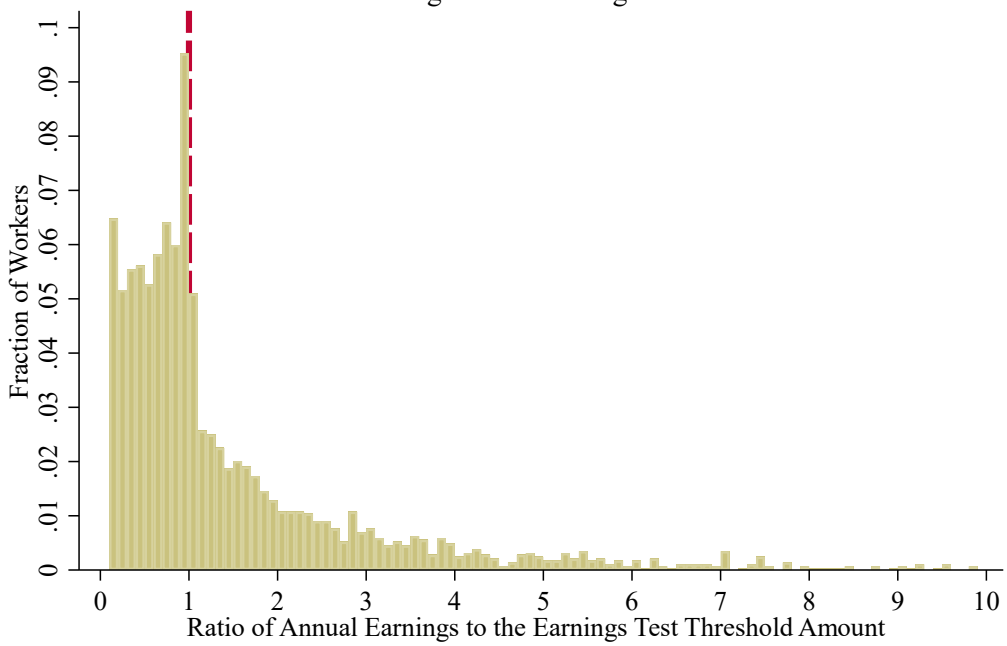


Figure 3b. Fraction of Male Non-Beneficiaries Age 64 in the CPS by the Ratio of Annual Earnings to the Earnings Test Threshold Amount

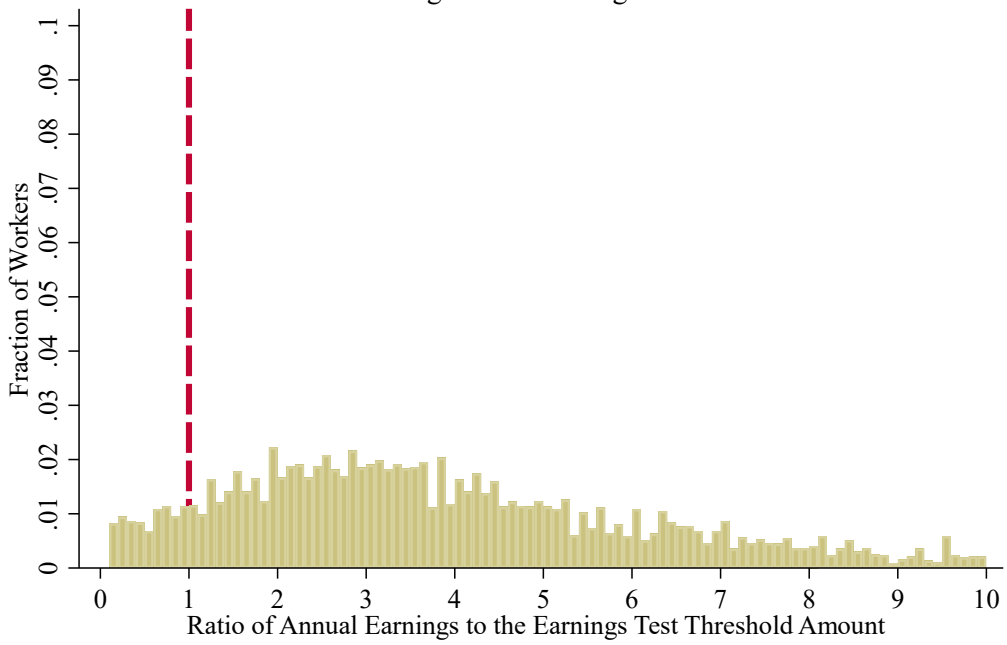


Figure 4a. Fraction of Male Beneficiaries Ages 62-64 in the HRS by the Ratio of Annual Earnings to the Earnings Test Threshold Amount

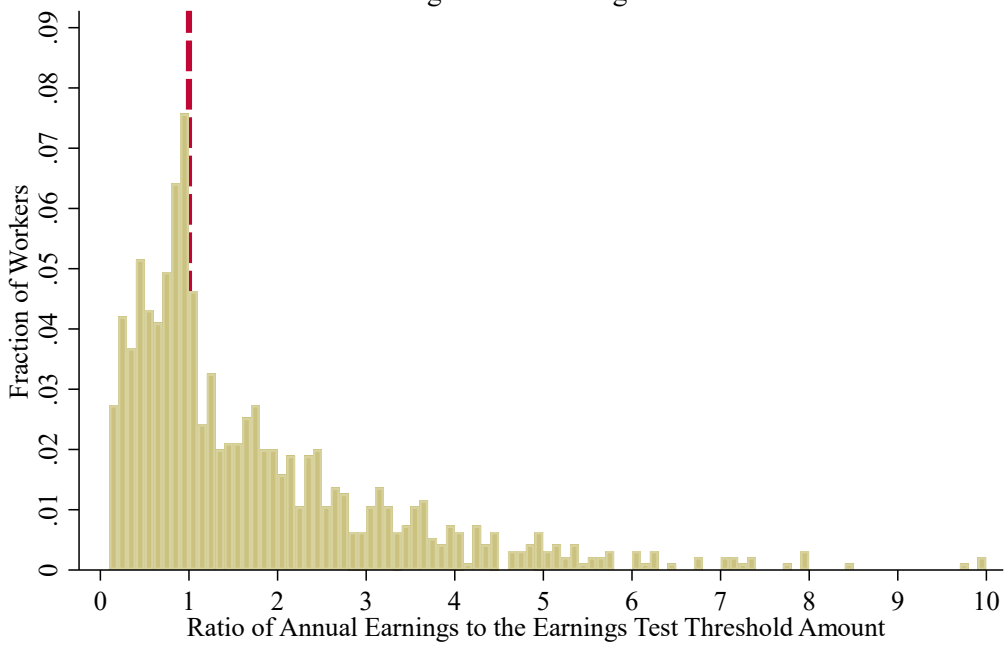


Figure 4b. Fraction of Male Non-Beneficiaries Ages 62-64 in the HRS by the Ratio of Annual Earnings to the Earnings Test Threshold Amount

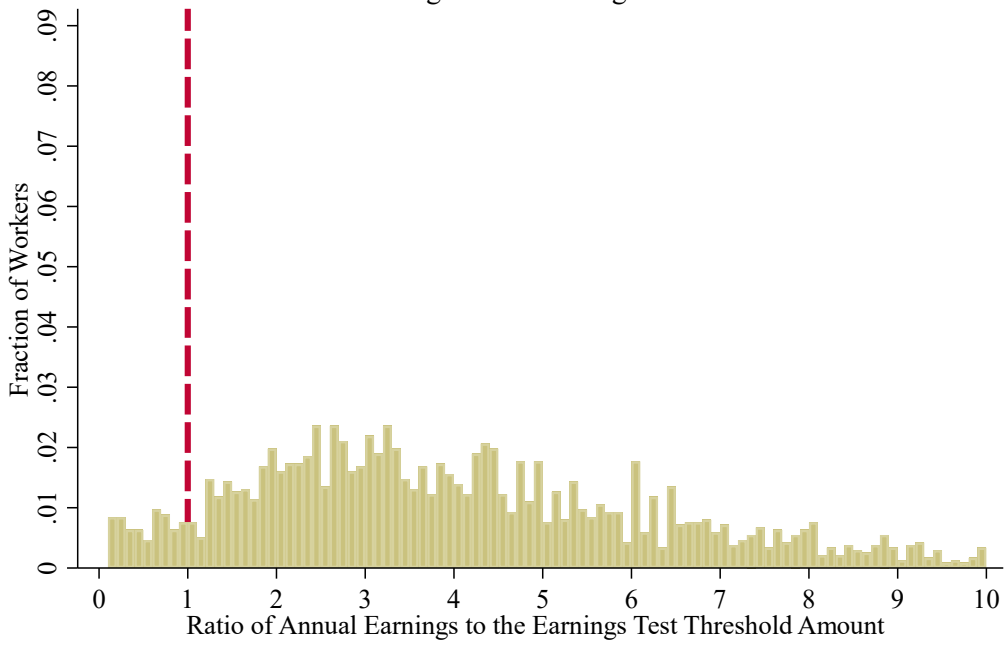


Figure 5. The Real Minimum Wage and Minimum Annual Hours Required to Achieve Earnings Test Threshold for 1983-2016

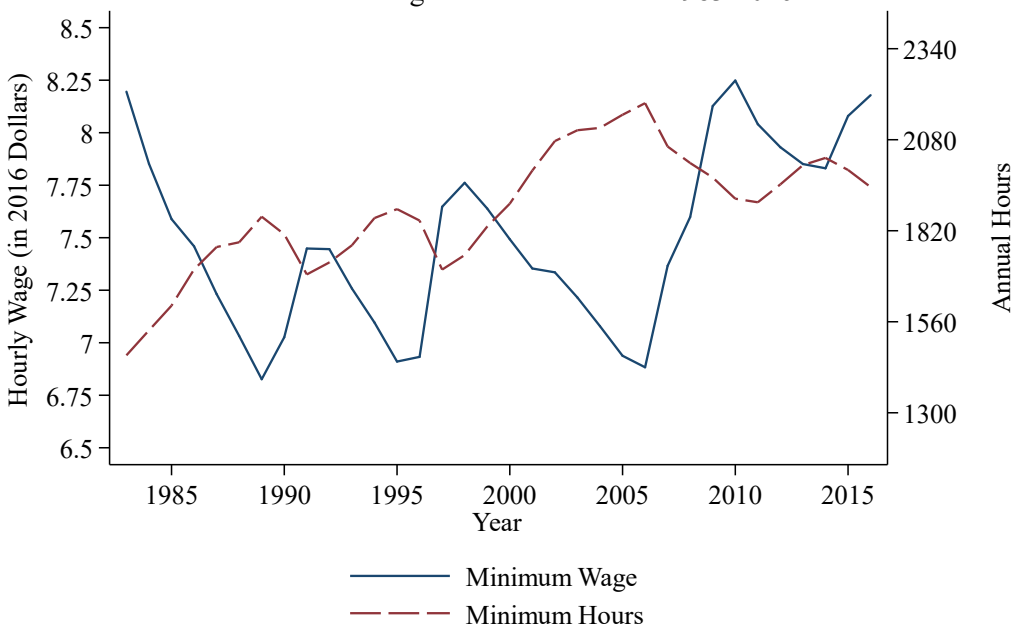


Figure 6a. Fraction of Male Beneficiaries Ages 62-64 in the HRS by the Ratio of The Hourly Wage to the Minimum Wage

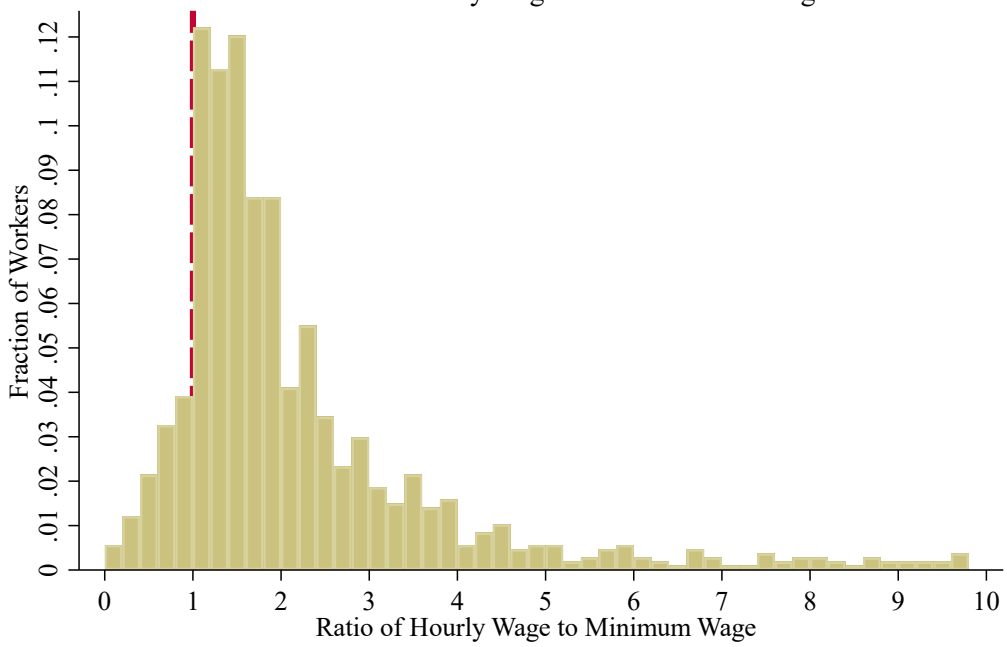


Figure 6b. Fraction of Male Non-Beneficiaries Ages 62-64 in the HRS by the Ratio of The Hourly Wage to the Minimum Wage

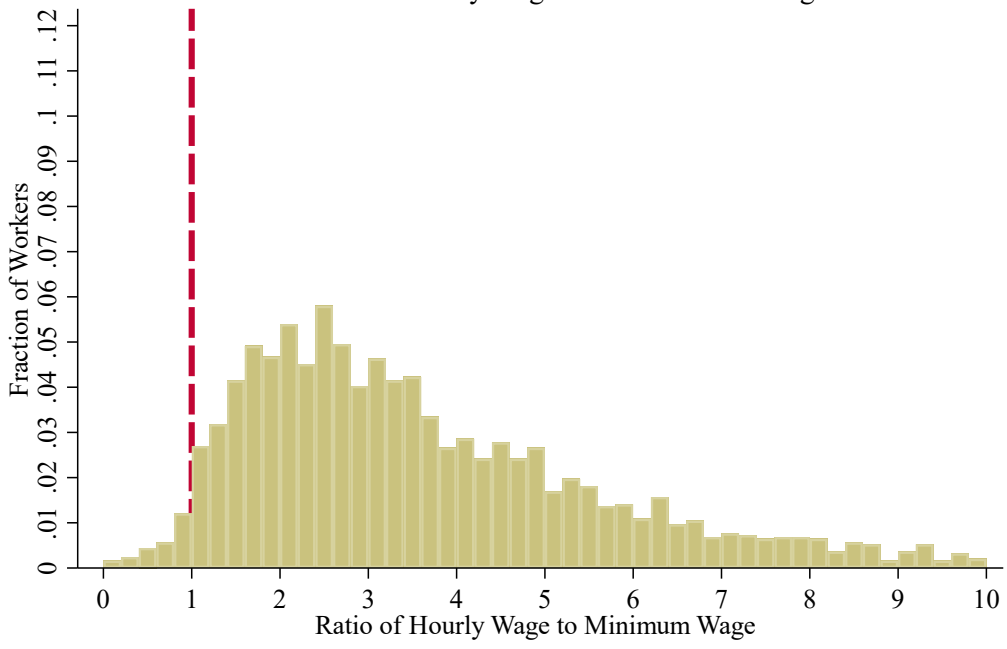


Figure 7. The Real Minimum Wage and Percent of 64 Year Old Men in the CPS with Hourly Wages at or below 150% of the Minimum Wage for 1983-2016

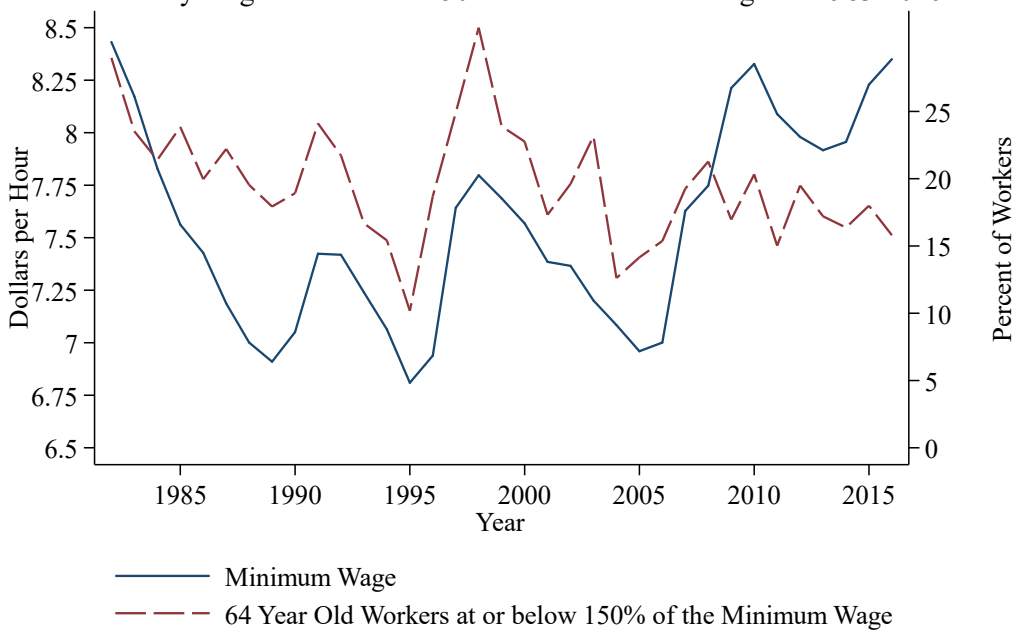


Figure 8. Annual Hours for 64 Year Old Men in the CPS by Beneficiary Status and Year and the Minimum Hours Required to Achieve Earnings Test Threshold

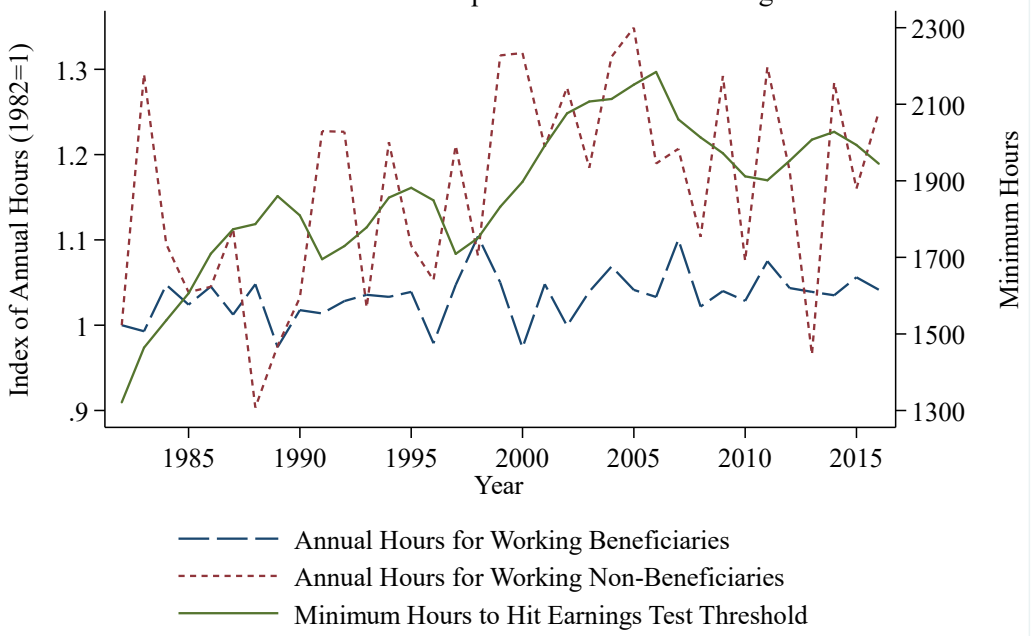


Figure 9. Percent of 64 Year Old Men Not Working in the CPS by Beneficiary Status and Year and the Minimum Hours Required to Achieve Earnings Test Threshold

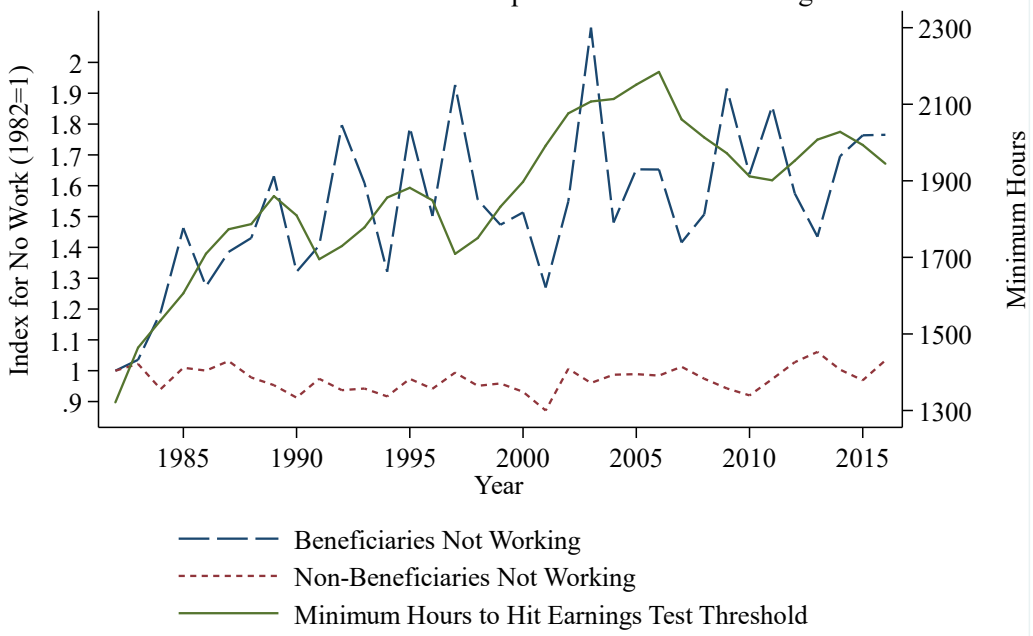
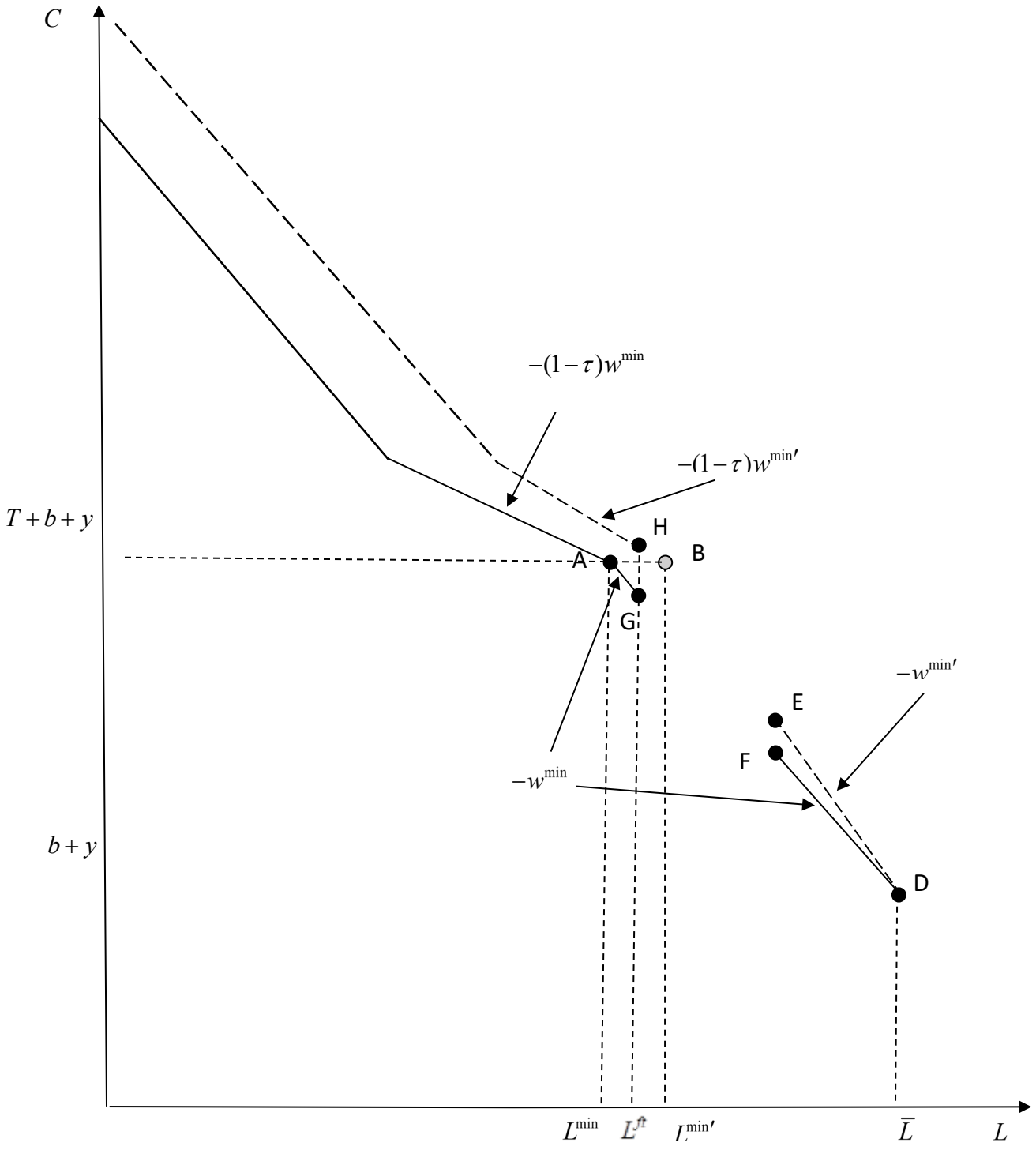


Figure 10. *The Labor-Supply Impact of an Increase in the Minimum Wage Under the Earnings Test with Constraints at Full-Time and Part-Time Hours*



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