Abstract

This study uses linked survey-administrative data to study the relationship between minimum wages and claiming of social security retirement insurance. We analyze the relationship between minimum wages and retirement by analyzing near- or at-retirement age workers. These results have important implications for understanding the comprehensive effect of minimum wages for both workers and the government by providing new evidence on minimum wages and receipt of public assistance. First, we show that minimum wage increases are associated with greater earnings and probability of being employed for individuals ages 55-70, although this is mostly for the relatively younger individuals. Next, we show that minimum wage increases that occur when an individual is 65 are associated with a decrease in the probability of claiming retirement benefits at that age. Age 65 is the first age at which most of our sample is eligible for full retirement benefits.

JEL codes: J23, J26
Keywords: minimum wages, retirement, earnings, linked administrative data

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1 Introduction

Retirement is an important time in one’s life cycle, and with the aging United States population, it remains as important as ever to understand the many factors that go into retirement decisions. Given national concerns related to Social Security, any public policy that influences retirement outcomes of the elderly and near elderly should be analyzed in great detail. One policy that has been understudied in its relation to retirement is the minimum wage. Because a disproportionate share of minimum wage workers are teenagers, effects of minimum wage policy on older workers gets overlooked. For older workers that make at or near the minimum wage, exposure to a minimum wage increase may influence an individual’s decision of whether to continue working or retire.

The minimum wage reduces wage inequality for those in the lower-tail of the earnings distribution, but it may do so while also causing a disemployment effect or lower earnings for other workers. While it is true that many low wage workers are young, Borgschulte and Cho (2019) show that there are rising rates of minimum wage work among those above age 50. If there is a dis-employment effect associated with the minimum wage, then this group of elderly and near elderly workers may be especially vulnerable to losing jobs and being forced into early retirement. This would put an ever greater strain on an already struggling U.S. Social Security system.

In this paper, we test whether minimum wage policy has the potential to impact earnings, employment, and retirement decisions of older workers. Our study is motivated in part by Borgschulte and Cho (2019) who find no evidence that higher minimum wages force early retirement, and instead have small positive effects on labor supply of older workers. We revisit the topic and contribute new analysis using unique longitudinal, person-level micro-data tracking labor force and retirement over several decades. Specifically, we use person-level Survey of Income and Program Participation (SIPP) data linked to annual administrative records of earnings and social security from the Internal Revenue Service and the Social Security Administration. Compared to Borgschulte and Cho (2019), who study aggregate, county-level data on number of retirees and retirement benefit amounts dispensed, we have access to individual-level
social security records on retirement applications and receipts. Hence, our major contribution is
the ability to more precisely analyze the timing of individual retirement decisions and account
for potential unobserved confounders.

Using a difference-in-differences design with person fixed effects, we first show that minimum
wage increases are associated with positive earnings and employment among older workers (ages
55-70) who have annual earnings less than 200% of the full-time minimum wage equivalent.
Then, we limit the sample to individuals who are eligible to claim retirement benefits (ages 62-
70) and find no evidence that the probability of applying for retirement benefits is associated
with changes in the minimum wage at any point during this age range. In order to analyze the
timing of retirement, we augment the original model to include a series of interaction terms that
allow effects to vary with age. Under this specification, we first show that the positive earnings
and employment effects of minimum wages among older workers are largest at younger ages.
However, when analyzing retirement decisions using this specification, we find that minimum
wage increases are associated with an approximately 7.5 percentage point reduction in the
probability of retiring at specifically age 65, which corresponds to the age at which individuals
first quality for full retirement benefits for most of our sample.

2 Background

2.1 The Impact of Minimum Wages on Employment and Earnings

As a larger share of older workers now make at or near the minimum wage, understanding
effects of minimum wage increases on employment and earnings outcomes is of interest in
analyzing policy effects. Dis-employment effects or substantial earnings effects of a minimum
wage increase could impact older workers and their retirement decisions. The short-run, or
contemporaneous, impact of minimum wages on employment and earnings outcomes has been
studied for many decades, and as this is the most complete literature related to the minimum
wage, it is appropriate to review concerns raised within earlier work. Additionally, many
econometric concerns in estimating the relationship between minimum wages and employment
when using panel data are also relevant to our minimum wage-retirement study.

The literature consistently finds positive earnings effects associated with minimum wage increases with minimum wage-earnings elasticities around 0.2. Employment effects are much more controversial. Traditional competitive models of the labor market lead to the idea that if employers are forced to pay higher wages, then they will hire less people or cut worker hours, which leads to a dis-employment effect of the policy. On the other hand, small dis-employment or no dis-employment effects could be explained by monopsony in the labor market, market frictions such as hiring and training costs associated with employee turnover, and the ability of firms to pass higher labor costs onto consumers through higher prices (Schmitt et al., 2013; Lindner and Harasztosi, 2019). The topic has been debated extensively in the literature, and results often hinge upon both the methodology and data being used.

While a number of studies have thoroughly reviewed the debated literature on the minimum wage and employment (see among others, Neumark and Wascher (2008); Neumark et al. (2014); Totty (2017)), it is important to provide a brief overview of its overall theme. Typically, studies of the minimum wage and employment either focus locally on employment in a low-skill industry or teenage/restaurant employment. Studies that utilize panel data on teenage or restaurant employment often find conflicting results, depending on the method and data used.

While there is general agreement that endogeneity concerns exist within the national, panel data approach, there is a substantial level of dissent in how to best model the impact of minimum wages on employment. The traditional approach of Neumark and Wascher (1992); Neumark et al. (2007); Neumark and Wascher (2008); Sabia (2009), which uses ordinary least squares estimation with unit and period fixed effects, yields statistically significant minimum wage-employment elasticities between -0.1 and -0.3. While these estimated dis-employment effects are quite large, Dube et al. (2010) and Allegretto et al. (2011) raise concerns that there is a large correlation between states that raise their minimum wage and negative preexisting trends in employment. Each study contends that census division-by-period fixed effects and state-specific, linear time trends are necessary to attain unbiased minimum wage-employment estimates, which subsequently produce small or zero dis-employment effects. While the two
camps have continued to debate the relative merits of census division-by-period fixed effects and state-specific time trends in subsequent papers, more recent work using a flexible, middle-ground approach has found dis-employment effects that are small or zero and, overall, supports the use of census division-by-period fixed effects and state-specific trends over simply using two-way fixed effects (Totty 2017).

3 Data and Sample Selection

The data in this study comes from version 7.0 of SIPP Synthetic Beta (SSB), a Census Bureau product that integrates person-level micro-data from household surveys with administrative tax and benefit data. SSB links survey information of households obtained from the SIPP to Form W-2 records and Social Security Administration (SSA) records of retirement and disability benefit receipt. The purpose of the SSB is to provide access to linked data that are usually not publicly available due to confidentiality concerns. To maintain confidentiality of respondents, Census synthesizes (models) all the variables in a way that changes the record of each individual so as to preserve the underlying covariate relationships between the variables. Not only is SSB advantageous due to its linking of SIPP data to administrative data from the IRS, but it is also appealing to new users of SIPP as little data preparation or cleaning is needed. The SSB is based on nine SIPP panels (1984, 1990, 1991, 1992, 1993, 1996, 2001, 2004, and 2008). The SSB data is well-suited to study effects of a minimum wage increase on retirement decisions due to its very detailed earnings and retirement-timing information. To analyze earnings of older workers, we use the administrative data on annual earnings from both FICA
and non-FICA-covered jobs from the IRS. In the analysis, we study both the log of total earnings and the probability of having positive earnings (an extensive margin measure of labor force participation). In the analysis of retirement decisions of older workers, we use the date that an individual applied for social security retirement benefits in the SSA data.

Each SIPP panel is relatively short (some only a single year), and they contain multiple survey responses of individuals across time. For example, in the 2001 SIPP panel, individuals are surveyed monthly from 2001 till 2004. In 2004, a new SIPP panel begins to follow an entirely separate group of individuals. Within each panel, we observe monthly values of all SIPP variables. For the linked administrative data, we have annual values from 1978-2014 for some variables, and 1951-2014 for others, allowing us to observe the earnings and Social Security information of individuals for many years.

To focus on a sample of older workers, we limit the earnings analysis to those with positive earnings every year between the ages of 55 and 70. In the analysis of employment and retirement, we limit the sample to individuals with non-missing earnings (that is, the person can have zero earnings, which we interpret as not employed) and retirement data over the period. For the retirement analysis, because 62 is the age of early retirement, we focus on a sample of individuals ages 62-70. By limiting the analysis to those with positive/non-missing earnings/retirement information we implicitly impose a balanced panel for each sample of individuals. Finally, to focus on a group of individuals most likely to be responsive to a change in the minimum wage, we conduct the analysis using low-wage workers. We do this by limiting the sample to individuals who never have a year during which their earnings are greater than 200% of the equivalent of a full-time minimum wage job over ages 55-70. For the employment and retirement sample, when individuals can have zero earnings, we further require that they have at least three years with positive earnings from ages 55-61, in order to select workers who appear to be at least marginally attached to the labor market before they are eligible for early retirement benefits. These restrictions yield 25,472 observations for the earnings sample and 516,629 observations for the employment/retirement sample.
4 Econometric Methods

Since the main focus in this paper is to estimate the impact of minimum wage increases on the likelihood of retirement, as a first stage result, we estimate the impact of wage increases on earnings and employment of older workers. Then, focusing on a sample of older individuals whose retirement is likely to be impacted by wage effects, we estimate a second set of models using retirement as the outcome variable. To determine whether labor market and retirement outcomes are impacted by minimum wage increases, we exploit the longitudinal nature of the data and estimate a difference-in-differences (DiD) model that differences within-person before and after an increase in the minimum wage and also across individuals. This model, which is estimated via person-level fixed effects, compares the within-person changes in labor outcomes or retirement decisions from before and after a minimum wage increase. The DiD model takes the form:

\[ y_{ist} = \alpha_i + X_{st} \beta_1 + \beta_2 \log MW_{st} + \tau_t + u_{ist} \]  

where in Equation 1, \( y_{ist} \) is the outcome of interest (either the log of earnings, an indicator for having positive earnings, or an indicator for having applied for social security retirement benefits) of individual i located in state s at time t. \( X_{st} \) is a vector of observable state characteristics that may be correlated with labor market outcomes and minimum wages (the log of population size and the log of unemployment). \( \tau_t \) is a year fixed effect to mitigate concerns of unobserved characteristics driving any effects across time and \( \alpha_i \) is a person-level fixed effect to address individual-level unobservables. The right-hand side variable of interest is \( \log MW_{st} \), which represents the log of the minimum wage in state s at time t, and \( \beta_2 \) is the estimated impact of minimum wages on outcomes in each model.

Just as in Borgschulte and Cho (2019), identification in this model relies on the assumption that state minimum wage laws and unobserved determinants of outcomes for older workers are conditionally independent. If the minimum wage is correlated with \( u_{it} \), OLS estimates of \( \beta_2 \) will be biased. While we do not perceive simultaneity to be an issue (an individual’s
labor-leisure decision or retirement decision is unlikely to drive policymaker decisions to raise
the minimum wage), it is possible that the log of the minimum wage could be correlated with
unobservables. If this correlation is restricted to the fixed component of the within-estimator,
then estimation using person-level fixed effects yields an unbiased coefficient. By employing an
individual fixed effects estimation strategy, we mitigate concerns that unobserved characteristics
of older workers may be correlated with their likelihood of living in states with a more generous
minimum wage, and that this unobserved heterogeneity drives any findings. Although not
shown in Equation 1 above, we will also show results that include state-specific linear trends
and census division-by-period fixed effects.

Next, analogous to the approach of Borgschulte and Cho (2019), we allow effects to differ
for individuals of different ages. This is important because it may be the case that effects on
labor market and retirement outcomes are different depending on an individual’s life cycle. To
test this, we augment Equation 1 to the form:

$$y_{iast} = \alpha_i + X_{st} \beta_1 + \sum_{a=55}^{a=70} \beta_a \times (AGE_a \times \log MW_{st}) + \phi_a + u_{ist}$$

(2)

where we include a series of interactions between the log of the minimum wage and age dummy
variables. Here, we allow the impact of wage increases to differ across the age of individual i,
and we estimate separate $\beta_a$ coefficients for each age.\(^3\) Because it is impossible to estimate a
model with individual, year, and age fixed effects, in this augmented model, we replace year
fixed effects with age fixed effects denoted by $\phi_a$.

5 Results

Using two samples of older workers (the first containing individuals between ages 55-70 and the
second 62-70) we separately analyze effects of the minimum wage on log earnings, employment,
and retirement decisions. First, within the sample of near elderly and elderly workers, we
estimate the DiD model outlined by Equation (1). Table 2 shows results of models testing

\(^3\)In the retirement analysis, we limit the sample to those eligible to receive retirement benefits, i.e., individuals
between the ages 62-70.
effects on both the log of annual earnings and the likelihood of employment. From Column 1, we find a positive coefficient on earnings of 0.5287 ($p < 0.10$). This indicates that among the sample of individuals ages 55-70, if exposed to a minimum wage increase, individuals experience a significant increase in earnings. Column 2 shows the same model except now including both census division-by-period fixed effects and state-specific, linear time trends. While the coefficient is no longer statistically significant, the magnitude is now 0.1666, which is much more similar to previous estimates of minimum wage-earnings elasticities from the literature which are typically around 0.2. Columns (3) and (4) present results testing the likelihood of employment. From Column (3), exposure to a minimum wage increase leads to an increase in the likelihood of employment of 0.0519 ($p < 0.05$). Again, once including the additional controls, Column (4) shows that the coefficient of interest becomes insignificant.

Table 3 presents results of the retirement analysis outlined by Equation (1). Again, this sample is restricted to individuals that have approached the legal age to begin receiving social security retirement benefits. Among the full sample of individuals ages 62-70, there is no statistically significant impact of minimum wage increases on retirement either with or without the inclusion of additional fixed effects and time trends. This indicates that among the full sample of low-wage earners that have reached retirement age, once exposed to a minimum wage increase, individuals do not appear to respond any differently in their decision to retire before age 70.

While the results from estimating Equation (1) are revealing, they may mask heterogeneous effects of minimum wages on earnings and employment across the 55-70 age range or effects of minimum wages on the timing of claiming retirement benefits. We estimate Equation (2), which includes a series of minimum wage-age interactions, and plot the estimated coefficients along with 95% confidence intervals in Figures 1-6. First, Figures 1 and 2 show coefficients estimating effects on the log of annual earnings both without and with additional fixed effects and time trends, respectively. From Figure 1, an increase in the minimum wage leads to

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4Regarding the fairly large standard error and lack of statistical significance, it is worth noting again that the analysis so far is only based on synthetic data. The noise injected into synthetic data can at times obscure the true relationship between variables that exists in the confidential data.
significantly higher earnings for all ages until an individual reaches 67 years old. For those that are 67-70, there is no significant effect on earnings. Figure 2 presents results that include the additional controls. After their inclusion, large positive earnings effects that are either statistically significant or close are visible only for ages 55-61.

Figures 3 and 4 show the estimated coefficients of Equation (2) with employment as the outcome variable both with and without the added controls. From Figure 3, exposure to a minimum wage increase leads to a significant increase in the probability of employment among those that are ages 55-62, however the effect becomes insignificant above age 62. Figure 4 plots estimated coefficients with the added controls. Under this specification, similar to the earnings result above, the impact of employment is positive and significant only for younger ages. Also, for those that are 63 years old, there is a slightly negative and significant effect on employment.

Finally, Figures (5) and (6) present retirement results heterogeneous across age. For both sets of models with and without the added controls, effects on retirement are largely insignificant. Interestingly, however, for those that are specifically 65 years of age (which is the age at which the most of our sample is first eligible for full retirement benefits), there is a noticeably sharp decrease in the probability of applying for social security retirement benefits associated with exposure to a minimum wage increase. This indicates that once observing an increase in wages, those that are 65 years old are significantly less likely to retire. Combined with the results in Table 3, this suggests that minimum wage increases may be inducing individuals to change the timing of the retirement benefit claiming. The exact nature of these timing decisions will be explored further as we continue to develop this project.

6 Conclusion

Due to the aging U.S. population and concerns related to Social Security, it is important to analyze the impact of any change in policy on incentives to work and remain in the labor force. Any form of public policy that provides the incentive to delay claiming of Social Security

\footnote{It is interesting to note that at age 65, there is a slightly noticeable increase in the probability of employment following a minimum wage increase. This estimated coefficient is very near the border of the 95% confidence interval.}
benefits and continued labor force participation presumably lessons the fiscal burden on the overall system. Not only would such a policy reduce the amount of money being drawn from the system at a give point in time, but it would also increase tax revenue procured from the delaying worker. It is as important as ever to study large scale implications that could have a lasting impact on Social Security and retirement benefits in an effort to make improvements of the system in the future.

This paper revisits the minimum wage-retirement topic introduced by Borgschulte and Cho (2019) using data containing more detailed information on the individual-level timing of retirement decisions of low-wage individuals. As a first stage result, we find evidence that both earnings and employment are positively associated with increases in the minimum wage, with effects being larger for relatively younger workers near elderly age range (55-60). Then, as a second stage result, we estimate the impact of minimum wages on retirement and find no effect for all ages except age 65. We find evidence that for those that are age 65, which is the age at which most of our sample first qualifies for full retirement benefits, an increase in the minimum wage leads to a reduction in the likelihood of claiming retirement benefits. This result implies that once exposed to an increase in the minimum wage, low-earning workers that are age 65 may choose to delay retirement and remain in the labor force. Given fiscal concerns related to retirement, this implies that the minimum wage has the potential to lesson the societal burden of the Social Security system and increase the labor supply of older workers.

In future work, we intend to analyze the effect of minimum wages on retirement timing decisions further. We also plan to analyze the relationship between minimum wages and applications for social security disability benefits.
References


The specification is that same as column (1) of Table 2, except the year fixed effects are replaced with age fixed effects, which are further interacted with the log minimum wage variable. Ninety-five percent confidence intervals, shown in the shaded region, are based on standard errors clustered at the state level.
Figure 2: Effect of Minimum Wages on Log Annual Earnings By Age

The specification is that same as column (2) of Table 2, except the year fixed effects are replaced with age fixed effects, which are further interacted with the log minimum wage variable. Ninety-five percent confidence intervals, shown in the shaded region, are based on standard errors clustered at the state level.
The specification is that same as column (3) of Table 2, except the year fixed effects are replaced with age fixed effects, which are further interacted with the log minimum wage variable. Ninety-five percent confidence intervals, shown in the shaded region, are based on standard errors clustered at the state level.
The specification is that same as column (4) of Table 2, except the year fixed effects are replaced with age fixed effects, which are further interacted with the log minimum wage variable. Ninety-five percent confidence intervals, shown in the shaded region, are based on standard errors clustered at the state level.
The specification is that same as column (1) of Table 3, except the year fixed effects are replaced with age fixed effects, which are further interacted with the log minimum wage variable. Ninety-five percent confidence intervals, shown in the shaded region, are based on standard errors clustered at the state level.
The specification is that same as column (2) of Table 3, except the year fixed effects are replaced with age fixed effects, which are further interacted with the log minimum wage variable. Ninety-five percent confidence intervals, shown in the shaded region, are based on standard errors clustered at the state level.
Table 1: Summary Statistics

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<th>(2) Employment/Retirement Sample</th>
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<td>mean</td>
<td>standard deviation</td>
<td>mean</td>
<td>standard deviation</td>
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<td>0.00</td>
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<tr>
<td>Applied for Retirement Benefits</td>
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<td>0.48</td>
<td>0.41</td>
<td>0.49</td>
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<tr>
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<td>1.21</td>
<td>5.16</td>
<td>1.28</td>
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<tr>
<td>Population</td>
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<td>8698526</td>
<td>11600000</td>
<td>9712664</td>
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<tr>
<td>Unemployment Rate</td>
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<td>1.89</td>
<td>5.96</td>
<td>1.86</td>
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<tr>
<td>Male</td>
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<td>0.41</td>
<td>0.34</td>
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Summary statistics are shown separately for the log earnings sample and the employment/retirement sample. The log earnings sample consists of individuals with positive earnings each year from ages 55-70. The employment/retirement analysis samples consist of individuals with non-missing earnings and retirement data each year from ages 55-70.
Table 2: Effect of Minimum Wages on Log Annual Earnings and Employment

<table>
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<th>(2)</th>
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<td>0.1666</td>
<td>0.0519**</td>
<td>-0.0060</td>
</tr>
<tr>
<td></td>
<td>(0.2111)</td>
<td>(0.1993)</td>
<td>(0.0191)</td>
<td>(0.0191)</td>
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<tr>
<td>Person FE</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Year FE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Census Division-by-Period FE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>State-Specific Time Trends</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>N</td>
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<td>25472</td>
<td>516629</td>
<td>516629</td>
</tr>
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</table>

Each specification is based on a difference-in-differences design that differences the pre- and post-minimum wage time periods across individuals. Each specification also controls for the log of the state-year unemployment rate and the log of the state-year population. Standard errors are clustered at the state level.
Table 3: Effect of Minimum Wages on Application for Retirement Benefits

<table>
<thead>
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<td>Log Minimum Wage</td>
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<td>0.0218</td>
</tr>
<tr>
<td></td>
<td>(0.0146)</td>
<td>(0.0272)</td>
</tr>
<tr>
<td>Person FE</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Year FE</td>
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<tr>
<td>Census Division-by-Period FE</td>
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Each specification is based on a difference-in-differences design that differences the pre- and post-minimum wage time periods across individuals. Each specification also controls for the log of the state-year unemployment rate and the log of the state-year population. Standard errors are clustered at the state level.