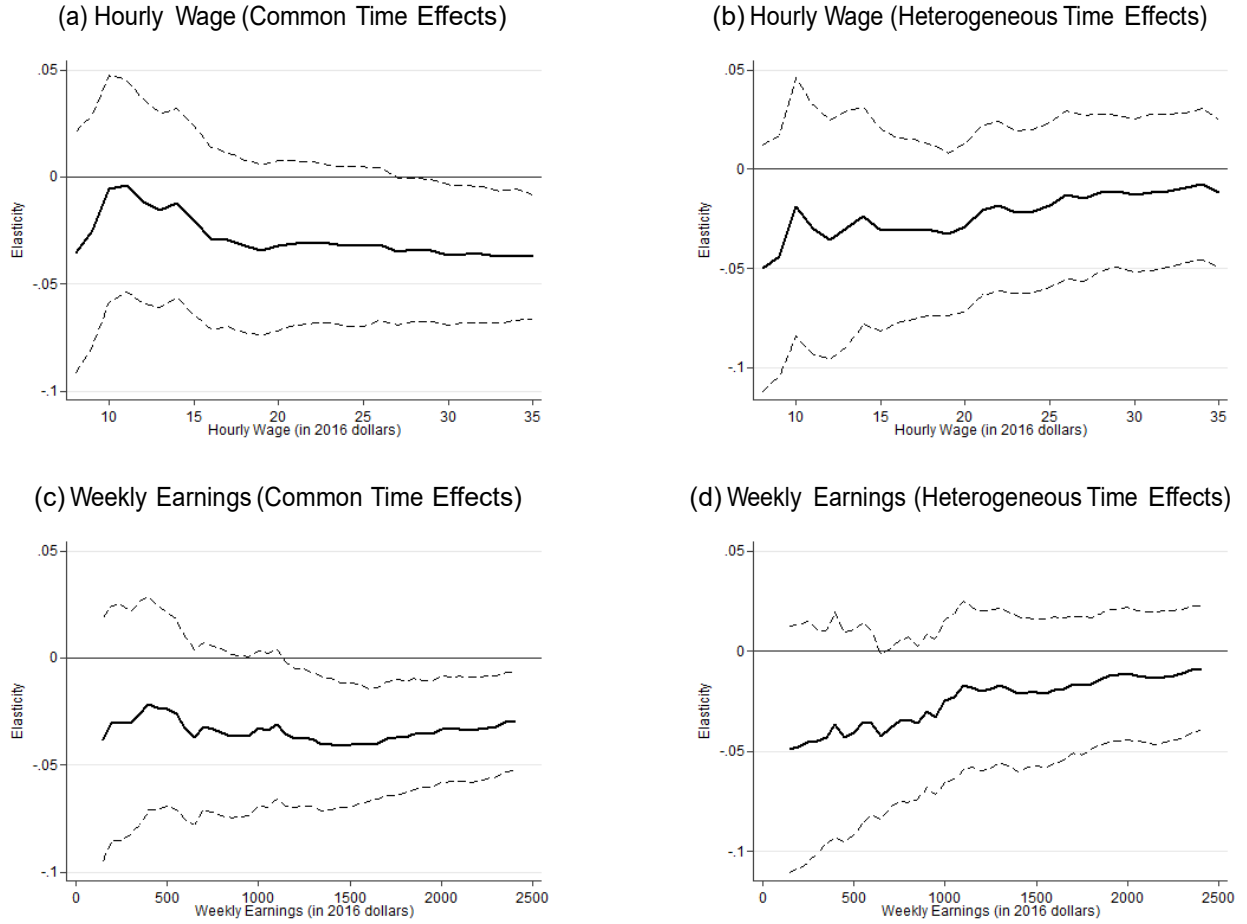


ONLINE APPENDIX

Minimum Wages and Retirement

Hee-yeon Cho and Mark Borgschulte

Figure A.1. Minimum Wage Effects on the Proportion of Earning Below Certain Cutoffs



Notes: We estimate $\ln(y_{cst}) = \beta_c \ln(MW_{st}) + \varphi_s + \varphi_{adt} + \pi_s / s_t + \varepsilon_{cst}$ where c denotes wage or earnings cutoffs and y_{cst} is the percentage earning below c in an age $\times$ state $\times$ time cell. Thus, we estimate the impact of minimum wages on the proportion of earning below a certain hourly wage or weekly earnings for different cutoffs. In particular, the cutoffs c are 8, 9, 10, up to 35 for the left graph (hourly wage), and 150, 200, 250, up to 2,400 for the right graph (weekly earnings), in 2016 dollars. The figures plot the coefficients β_c (solid lines) and corresponding 95% confidence intervals (dashed lines). The samples are restricted to age groups ranging from 62 to 70 from the CPS data (1989-2016). Robust standard errors are clustered by states. The dependent variables are the percentage earning below cutoffs c in an age $\times$ state $\times$ time cell. For those who are not working, their hourly wages or weekly earnings are considered to be 0.

Figure A.2. Heterogeneous Effects of Minimum Wages by Industries

(a) Age 55-64

(b) Age 65+



Notes: The graphs plot industry-specific minimum wage effects with 95% confidence intervals. Robust standard errors are clustered by states. The sample includes the Quarterly Workforce Indicator data from 2000 to 2016, weighted by state population. The dependent variables are Log(Employment) (row 1), Log(Separations) (row 2) and Log(Hires) (row 3), respectively. We run separate regressions for age groups 55-64 (left) and age groups 65+. We interact the log of minimum wage with industry dummies (NAICS codes) and plot the coefficients for each industry in the above graphs. Also, we control for state $\times$ industry fixed effects, division $\times$ industry $\times$ time fixed effects, and state $\times$ industry specific time trends.

Table A.1. Summary Statistics for QWI and OASDI

	All Counties Samples				Border Counties Samples			
	65-99		55-64		65-99		55-64	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Quarterly Workforce Indicators								
Employment	21,581	40,071	67,812	116,757	16,233	27,751	51,237	83,840
Separations	3,935	7,570	7,949	14,002	2,799	5,101	5,684	9,243
Hires	3,493	6,871	7,357	13,053	2,410	4,461	5,162	8,332
# of Counties	3,141		3,141		1,136		1,136	
Observations	203,256		203,256		73,158		73,158	
Social Security (Retirement)								
Beneficiaries	80,192	130,735			66,864	107,789		
Benefits (in 1,000 dollars)	98,639	161,766			82,730	135,442		
# of Counties	3,150				1,137			
Observations	140,772				51,078			

Notes: The table shows descriptive statistics of main variables from the Quarterly Workforce Indicators (2000-2015) and the SSA's Old-Age, Survivors, and Disability Insurance Data (1983-2015). The statistics are shown for all-counties samples in columns (1) to (4), and border counties samples in columns (5) to (8). We focus on employment, separations, and hires for the QWI data, and retirement beneficiaries and benefits for the SSA/OASDI data. The QWI are reported quarterly and are categorized into several age groups; here we focus on 65-99 and 55-64. The OASDI retirement data are reported annually without any age stratification as in the QWI.

Table A.2. Yearly Summary Statistics of Minimum Wages and Employment for Population, Age 62-70

Year	Effective minwage	Emp to pop	At or Below Minimum Wage			At or Below 1.2×Minimum Wage		
			Emp to pop	Share of workers	Share of hours	Emp to pop	Share of workers	Share of hours
1983	8.18	0.247						
1984	7.84	0.243						
1985	7.57	0.237						
1986	7.43	0.240						
1987	7.19	0.242						
1988	7.04	0.245						
1989	6.89	0.251						
1990	7.05	0.254	0.015	0.059	0.056	0.032	0.124	0.108
1991	7.43	0.246	0.020	0.080	0.070	0.040	0.163	0.137
1992	7.42	0.246	0.017	0.070	0.066	0.038	0.155	0.138
1993	7.22	0.249	0.014	0.057	0.050	0.034	0.135	0.113
1994	7.06	0.260	0.016	0.063	0.058	0.037	0.143	0.125
1995	6.87	0.258	0.017	0.064	0.063	0.036	0.138	0.126
1996	6.86	0.258	0.016	0.061	0.062	0.033	0.129	0.117
1997	7.46	0.269	0.022	0.081	0.078	0.043	0.163	0.150
1998	7.78	0.274	0.021	0.079	0.074	0.045	0.164	0.145
1999	7.66	0.279	0.018	0.065	0.065	0.039	0.142	0.129
2000	7.46	0.287	0.017	0.059	0.056	0.036	0.126	0.112
2001	7.37	0.298	0.014	0.048	0.047	0.029	0.100	0.092
2002	7.32	0.306	0.015	0.050	0.049	0.028	0.094	0.087
2003	7.21	0.314	0.013	0.041	0.037	0.025	0.079	0.069
2004	7.07	0.322	0.012	0.039	0.038	0.024	0.075	0.068
2005	7.03	0.334	0.011	0.032	0.029	0.023	0.068	0.061
2006	7.05	0.343	0.012	0.034	0.032	0.023	0.069	0.063
2007	7.59	0.345	0.016	0.046	0.044	0.034	0.099	0.086
2008	7.78	0.348	0.015	0.043	0.038	0.034	0.100	0.086
2009	8.23	0.350	0.017	0.049	0.045	0.036	0.102	0.089
2010	8.31	0.354	0.017	0.047	0.042	0.039	0.111	0.099
2011	8.08	0.360	0.016	0.044	0.040	0.035	0.098	0.083
2012	7.99	0.361	0.014	0.040	0.040	0.035	0.098	0.086
2013	7.90	0.362	0.014	0.038	0.037	0.032	0.090	0.079
2014	7.96	0.366	0.014	0.038	0.036	0.033	0.092	0.081
2015	8.18	0.371	0.015	0.041	0.039	0.035	0.095	0.084
2016	8.34	0.378	0.017	0.046	0.044	0.039	0.103	0.092

Notes: The table shows yearly descriptive statistics from the Current Population Survey (1983-2016), restricting the sample to workers age 62-70. Sample statistics are weighted by the CPS weights. Effective minimum wage is the applicable federal or state minimum wage, adjusted in 2016 dollars. Column (3) shows the employment-to-population ratio for all workers. Columns (4) to (6) show the employment-to-population ratio for workers at or below minimum wage, share of workers at or below minimum wage, and share of hours at or below minimum wage. Columns (7) to (9) also show similar statistics as columns (4) to (6), focusing on workers at or below 120% of minimum wage. Wage information is not available prior to 1990 from the IPUMS CPS data, so columns (4) to (9) are left blank for years 1983 through 1989.

Table A.3. Pre-Existing Trends in Employment and Earnings (Excluding Self-Employed)

	Log(Emp/Pop)		Log(Full Emp/Pop)		Log(Part Emp/Pop)		Hours		Log(Earnings)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Effect of Minimum Wage Increase										
12 Quarters Ahead (η_{12})	-0.064 (0.070)	0.033 (0.076)	-0.071 (0.094)	0.040 (0.104)	-0.054 (0.082)	0.000 (0.130)	0.140 (0.403)	0.615 (0.461)	-0.149 (0.122)	0.090 (0.138)
4 Quarters Ahead (η_4)	-0.134 (0.092)	-0.054 (0.125)	-0.122 (0.147)	-0.005 (0.175)	-0.058 (0.118)	-0.132 (0.211)	-1.110* (0.654)	0.018 (0.838)	-0.439** (0.169)	-0.088 (0.213)
0 Quarter Ahead (η_0)	-0.073 (0.107)	0.156 (0.134)	-0.113 (0.159)	0.319* (0.171)	0.042 (0.190)	-0.057 (0.246)	0.087 (0.671)	1.839** (0.842)	-0.255 (0.198)	0.378* (0.212)
Difference between 4 (η_4) and 12 Quarters Ahead (η_{12})	-0.070 (0.065)	-0.087 (0.087)	-0.051 (0.110)	-0.045 (0.158)	-0.005 (0.089)	-0.133 (0.132)	-1.250* (0.677)	-0.597 (0.780)	-0.290 (0.173)	-0.179 (0.195)
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Age x Time Fixed Effects	Y		Y		Y		Y		Y	
Division x Age x Time Fixed Effects		Y		Y		Y		Y		Y
State Linear Trends		Y		Y		Y		Y		Y

Notes: Robust standard errors are clustered by states and shown in parenthesis. Here we estimate Equation (4), collapsing CPS observations (1983-2016) by state/age/quarter (62-70). $\ln(MW_{s,t+j})$ denotes the log of minimum wage in state s at j quarters after time t . η_{12} is the coefficient associated with $(\ln(MW_{s,t+12}) - \ln(MW_{s,t+4}))$, which is the effect of increase in minimum wage 12 quarters ahead relative to the minimum wage 4 quarters ahead; η_4 is the coefficient associated with $(\ln(MW_{s,t+4}) - \ln(MW_{s,t}))$, which is the effect of increase in minimum wage 4 quarters ahead relative to the contemporaneous minimum wage; η_0 is the coefficient associated with $\ln(MW_{s,t})$, which is the effect of the contemporaneous minimum wage. The difference between 4 and 12 quarters ahead ($\eta_4 - \eta_{12}$) represents the trend. The dependent variables are the log of employment-to-population ratio in columns (1) to (2), the log of full-time employment rate in columns (3) to (4), the log of part-time employment rate in columns (5) to (6), hours worked in previous week in columns (7) to (8), and the log of weekly earnings in columns (9) to (10). We exclude the self-employed when constructing the above variables. For all specifications, we include state fixed effects. Columns (1), (3), (5), (7), and (9) include age $\times$ time fixed effects, whereas in columns (2), (4), (6), (8), and (10) we include division $\times$ age $\times$ time fixed effects with state linear trends.

Table A.4. Minimum Wage Effects on Employment, Earnings, and Hours, Age 50-61

	All			Wage and Salary		
	(1) All	(2) All	(3) Employed	(4) All	(5) All	(6) Employed
Panel A: Log(Employment/Population)						
Log(Minimum Wage)	-0.021 (0.025)	0.014 (0.019)		-0.103*** (0.036)	0.010 (0.028)	
Panel B: Log(Full Time Employment/Population)						
Log(Minimum Wage)	-0.076** (0.034)	-0.006 (0.026)		-0.152*** (0.045)	-0.004 (0.034)	
Panel C: Log(Part Time Employment/Population)						
Log(Minimum Wage)	0.177*** (0.059)	0.094* (0.053)		0.086 (0.065)	0.065 (0.063)	
Panel D: Hours Worked in Previous Week						
Log(Minimum Wage)	-0.250 (0.689)	-0.333 (0.555)	-0.568** (0.277)	-1.367* (0.734)	-0.610 (0.748)	-0.441 (0.368)
Panel E: Log(Weekly Earnings)						
Log(Minimum Wage)				-0.084* (0.044)	-0.014 (0.053)	-0.025 (0.036)
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y			Y		
Division x Age x Time Fixed Effects		Y	Y		Y	Y
State Linear Trends		Y	Y		Y	Y

Notes: Robust standard errors are clustered by states and reported in parentheses. Estimates are weighted by the number of observations in each cell. The sample includes monthly CPS data from 1983-2016 (ages 50-61). The unit of observation is a state/age/quarter cell, collapsed from the CPS data. Employment in column (1) to (3) refers to wage/salary employed and self employed, whereas columns (4) to (6) refer only to wage/salary employed. The main explanatory variable is the log of effective minimum wage. The dependent variable for panel A is the log of employment rate, for panel B, the log of full-time employment rate, for panel C, the log of part-time employment rate, for panel D, hours worked in previous week, and for panel E, the log of weekly earning. Working full-time and part-time are defined as working 35 hours or more and working less than 35 hours, respectively. For all specifications, we control for state fixed effects. In columns (1) and (4), we include time fixed effects. In columns (2) to (3) and (5) to (6), we include division × age × time fixed effects and state linear trends. We restrict our samples to the employed workers in columns (3) and (6).

Table A.5. Minimum Wage Effects on Wage/Salary Employment and Self-Employment

	Retirement Age Group (62-70)				Near-Retirement Age Group (50-61)			
	(1) All	(2) All	(3) Employed	(4) Employed	(5) All	(6) All	(7) Employed	(8) Employed
Panel A: Log(Employment/Population)								
Log(Minimum Wage)	0.110* (0.062)	0.059 (0.052)			-0.021 (0.025)	0.014 (0.019)		
Panel B: Log(Wage & Salary-Employment/Population)								
Log(Minimum Wage)	0.018 (0.075)	0.116* (0.064)			-0.099*** (0.035)	0.011 (0.027)		
Panel C: Log(Self-Employment/Population)								
Log(Minimum Wage)	0.364*** (0.119)	0.033 (0.189)			0.254*** (0.070)	-0.004 (0.106)		
Panel D: Hours Worked in Previous Week (Wage & Salary-Employed)								
Log(Minimum Wage)	0.502 (0.587)	1.290** (0.606)	0.510 (0.838)	2.172* (1.115)	-1.369* (0.732)	-0.618 (0.744)	-0.705*** (0.262)	-0.478 (0.370)
Panel E: Hours Worked in Previous Week (Self-Employed)								
Log(Minimum Wage)	0.606* (0.321)	0.263 (0.487)	1.844 (2.050)	3.455 (2.848)	0.882** (0.347)	0.171 (0.430)	-1.139 (0.854)	-1.364 (1.261)
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y				Y			
Division x Age x Time Fixed Effects		Y		Y		Y		Y
State Linear Trends		Y		Y	Y	Y		Y

Notes: Robust standard errors are clustered by states and reported in parentheses. Estimates are weighted by the number of observations in each cell. The sample includes monthly CPS data from 1983-2016. The unit of observation is a state/age/quarter cell, collapsed from the CPS data. Columns (1) to (4) restrict the samples to age 62-70 and columns (5) to (8) to 50-61. The main explanatory variable is the log of effective minimum wage. The dependent variable for panel A is Log(Employment/Population), for panel B, Log(Wage & Salary-Employment/Population), for panel C, the Log(Self-Employment/Population), for panel D, hours worked in previous week for wage-and-salary employed, and for panel E, hours worked in previous week for self-employed. In columns (1), (3), (5), and (7), we include time fixed effects. In columns (2), (4), (6), and (8), we include division × age × time fixed effects and state linear trends. In addition, columns (1) to (2) and (5) to (6) use all observations in the sample, whereas columns (3) to (4) and (7) to (8) restrict the samples to those who are employed.

Table A.6. Heterogeneous Minimum Wage Effects Across Sex and Marital Status

Dependent Variable: Log(Employment/Population)										
	All					Wage and Salary				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Male (without spouse)										
Log(Minimum Wage)	0.160 (0.124)	0.173 (0.123)	0.090 (0.157)	0.188 (0.160)	0.192 (0.153)	-0.015 (0.169)	0.000 (0.167)	0.081 (0.236)	0.158 (0.205)	0.162 (0.200)
Panel B: Male (with spouse)										
Log(Minimum Wage)	0.124** (0.054)	0.112** (0.055)	0.095 (0.086)	0.148** (0.067)	0.138** (0.066)	0.008 (0.091)	-0.008 (0.095)	0.096 (0.136)	0.270** (0.105)	0.270** (0.103)
Panel C: Female (without spouse)										
Log(Minimum Wage)	0.234** (0.090)	0.230** (0.091)	0.063 (0.124)	0.157 (0.119)	0.130 (0.119)	0.114 (0.091)	0.108 (0.091)	-0.026 (0.149)	0.176 (0.118)	0.144 (0.117)
Panel D: Female (with spouse)										
Log(Minimum Wage)	0.050 (0.129)	0.041 (0.125)	-0.018 (0.198)	-0.075 (0.108)	-0.086 (0.111)	-0.042 (0.142)	-0.052 (0.139)	-0.120 (0.238)	-0.167 (0.134)	-0.171 (0.135)
Fixed Effects										
State	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time	Y					Y				
Age x Time		Y					Y			
Division x Age x Time			Y	Y	Y			Y	Y	Y
State Linear Trends				Y	Y				Y	Y
Time-Varying Controls										
Log(Unemployment Rate)					Y					Y
Log(Total Population)					Y					Y

Notes: Robust standard errors are clustered by states and reported in parentheses. We restrict our samples to age 62-70, pooling age groups 62-64 and 65-70 together. Estimates are weighted by the number of observations in each cell. The main explanatory variable is the log of effective minimum wage, which is defined as the applicable federal or state level minimum wage, whichever is greater. The dependent variables are the log of employment-to-population ratio in columns (1) to (5) and the log of wage/salary employment-to-population ratio in columns (6)-(10), respectively. Panel A further restricts the samples to males without a spouse (never married, divorced, separated, or widowed), panel B to males with a spouse, panel C to females without a spouse, and panel D to females with a spouse.

Table A.7. Minimum Wage Effects on Prime Age Group

Dependent Variable: Log(Employment/Population)										
	All					Wage and Salary				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: All Cohorts										
Log(Minimum Wage)	-0.009 (0.014)	-0.010 (0.014)	-0.003 (0.021)	0.024* (0.013)	0.014 (0.009)	-0.025 (0.020)	-0.024 (0.020)	-0.011 (0.029)	0.026* (0.014)	0.014 (0.012)
Panel B: Male										
Log(Minimum Wage)	0.002 (0.017)	0.002 (0.017)	-0.007 (0.020)	0.012 (0.013)	0.002 (0.009)	-0.013 (0.025)	-0.011 (0.025)	-0.014 (0.032)	0.014 (0.018)	0.004 (0.014)
Panel C: Female										
Log(Minimum Wage)	-0.022 (0.026)	-0.021 (0.026)	0.006 (0.026)	0.039* (0.020)	0.027 (0.018)	-0.037 (0.030)	-0.036 (0.030)	-0.002 (0.033)	0.043** (0.021)	0.030 (0.022)
Panel D: High School Dropouts + High School Graduates										
Log(Minimum Wage)	0.036 (0.026)	0.034 (0.026)	0.023 (0.028)	0.047** (0.022)	0.032** (0.015)	0.013 (0.031)	0.013 (0.031)	0.012 (0.035)	0.044** (0.021)	0.030* (0.018)
Fixed Effects										
State	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time	Y					Y				
Age x Time		Y					Y			
Division x Age x Time			Y	Y	Y			Y	Y	Y
State Linear Trends				Y	Y				Y	Y
Time-Varying Controls										
Log(Unemployment Rate)					Y					Y
Log(Total Population)					Y					Y

Notes: Robust standard errors are clustered by states and reported in parentheses. We restrict our monthly CPS data to the age group 25-49 (Prime Age). The unit of observation is a state/age/quarter, collapsed from the CPS data. Estimates are weighted by the number of observations in each cell. The main explanatory variable is the log of effective minimum wage, which is defined as the applicable federal or state level minimum wage, whichever is greater. The dependent variables are the log of employment-to-population ratio in columns (1) to (5) and the log of wage/salary employment-to-population ratio in columns (6) to (10). Panel A uses all cohorts age 25-49. Panels B, C, and D restrict the samples to male, female, and high school dropouts/graduates, respectively.

Table A.8. Minimum Wage Effects on Employment, Separations, and Hires (2000-2016 CPS & QWI)

	65-99			55-64			45-54		
	CPS	QWI		CPS	QWI		CPS	QWI	
	All (1)	All (2)	Borders (3)	All (4)	All (5)	Borders (6)	All (7)	All (8)	Borders (9)
Panel A: Log(Employment)									
Log(Minimum Wage)	0.032 (0.079)	0.032 (0.033)	-0.002 (0.017)	-0.017 (0.029)	0.020 (0.022)	-0.007 (0.014)	-0.002 (0.016)	0.009 (0.027)	-0.015 (0.013)
Panel B: Log(Separations)									
Log(Minimum Wage)		0.065 (0.067)	-0.015 (0.083)		0.074 (0.075)	0.041 (0.090)		0.041 (0.065)	-0.003 (0.096)
Panel C: Log(Hires)									
Log(Minimum Wage)		-0.008 (0.087)	-0.041 (0.105)		0.044 (0.102)	0.036 (0.116)		0.026 (0.081)	0.009 (0.109)
State Fixed Effects	Y			Y			Y		
County Fixed Effects		Y	Y		Y	Y		Y	Y
Division x Time Fixed Effects	Y	Y		Y	Y		Y	Y	
State Linear Trends	Y	Y	Y	Y	Y	Y	Y	Y	Y
Border Pair x Time Fixed Effects			Y			Y			Y

Notes: Robust standard errors are clustered by states in columns (1), (2), (4), (5), (7), and (8) and two-way clustered by states and border segments in columns (3), (6), and (9). The sample includes the CPS data from 2000 to 2016 (columns (1), (4), and (7)) and Quarterly Workforce Indicator data from 2000 to 2016 (columns (2) to (3), (5) to (6), and (8) to (9)). The estimates are weighted by state population in columns (1), (4), and (7), and county population in columns (2), (5), and (8). For columns (3), (6), and (9), the estimates are weighed by (number of population in a county) × (the inverse of the number of pairs a county is part of). The main explanatory variable is the log of effective minimum wage, which is defined as federal or state level minimum wage, whichever is greater. The dependent variables are the log of employment in panel A, the log of separations in panel B, and the log of hires in panel C. For all specifications, we control for county fixed effects and the log of county population. The QWI samples are stratified into age groups: 65-99 (columns (1) to (3)), 55-64 (columns (4) to (6)), and 45-54 (columns (7) to (9)). For columns (2), (5), and (8), all counties in the samples are used in our regressions with division × time fixed effects. For columns (3), (6), and (9), only border counties are utilized with border pair × time fixed effects. Refer to Dube, Lester and Reich (2010) on how to construct the border-county samples.

Table A.9. Long Difference Estimates for the Effect of the Minimum Wage on Employment

Number of Years	1	2	3	4	5	6	7	8
Panel A: Without State Linear Trends								
Long Difference in Log(MW)	0.086 (0.065)	0.093 (0.076)	0.073 (0.067)	0.058 (0.064)	0.031 (0.071)	0.062 (0.076)	0.080 (0.079)	0.089 (0.086)
Panel B: With State Linear Trends								
Long Difference in Log(MW)	0.084 (0.065)	0.089 (0.077)	0.068 (0.069)	0.052 (0.069)	0.025 (0.075)	0.054 (0.081)	0.073 (0.085)	0.073 (0.101)
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Division x Age x Time Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Robust standard errors are clustered by states and reported in parentheses. We restrict our samples to age 62-70. Estimates are weighted by the number of observations in each cell. The main explanatory variable is the long difference in the log of effective minimum wage. The dependent variable is the long difference in the log of employment-to-population ratio. The column numbers correspond to the number of periods over which the long difference is taken. Panel B additionally includes state-specific linear trends.

Table A.10. Interactive Fixed Effects Model for Minimum Wage Effects

	OLS		Interactive Fixed Effects								
			Number of Unobserved Common Factors								
	0 (1)	0 (2)	1 (3)	2 (4)	3 (5)	4 (6)	5 (7)	6 (8)	7 (9)	8 (10)	9 (11)
Panel A: Log(Employment/Population)											
Log(Minimum Wage)	0.098 (0.064)	0.059 (0.052)	0.025 (0.050)	0.056 (0.049)	0.033 (0.046)	0.022 (0.046)	0.013 (0.046)	-0.013 (0.044)	-0.010 (0.046)	-0.002 (0.045)	-0.005 (0.046)
Panel B: Log(Full Time Employment/Population)											
Log(Minimum Wage)	0.071 (0.088)	0.145* (0.087)	0.129 (0.084)	0.166** (0.079)	0.169** (0.079)	0.173** (0.084)	0.177** (0.081)	0.184** (0.079)	0.158** (0.075)	0.146* (0.073)	0.139* (0.073)
Panel C: Log(Weekly Earnings)											
Log(Minimum Wage)	-0.077 (0.139)	0.301** (0.140)	0.146 (0.112)	0.141 (0.121)	0.198* (0.116)	0.218* (0.119)	0.205* (0.121)	0.212* (0.125)	0.217* (0.124)	0.219* (0.120)	0.199 (0.125)
Panel D: Log(Hourly Wage)											
Log(Minimum Wage)	0.009 (0.142)	0.236* (0.134)	0.169 (0.119)	0.143 (0.123)	0.156 (0.114)	0.208* (0.113)	0.210* (0.113)	0.255** (0.106)	0.259** (0.108)	0.236** (0.111)	0.266** (0.118)
State x Age Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y
Division x Age x Time Fixed Effects		Y									
State Linear Trends		Y									

Notes: Robust standard errors are clustered by states and shown in parentheses. We collapse CPS observations (1983-2016) by state/age/quarter (62-70). Dependent variables are Log(Employment/Population) (panel A), Log(Full Time Employment/Population) (panel B), Log(Weekly Earnings) (panel C), and Log(Hourly Wage) (panel D). Earnings and wage variables are constructed using the means over whole population in each cell, where only the wage-and-salary employed have values greater than zero. The key explanatory variable is the log of effective minimum wage. In all specifications, we control for state × age fixed effects. For columns (1) to (2), we use OLS estimation strategy, additionally controlling for time fixed effects (column (1)) and division × age × time fixed effects with state linear trends (column (2)). For columns (3) to (11), we estimate an interactive fixed effects model with different number of unobserved factors (corresponding to the column titles). The number of unobserved common factors used in the regressions is stated above each column number.

Table A.11. Minimum Wage Effects on Social Security and Retirement Income (1983-2015 CPS)

	Social Security Income				Other Retirement Income			
	Percent Beneficiaries		Amount of Benefits		Percent Beneficiaries		Amount of Benefits	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Minimum Wage)	-0.096*	-0.037	-0.195***	0.002	-0.475***	-0.278**	-0.280	-0.509***
	(0.049)	(0.057)	(0.056)	(0.066)	(0.124)	(0.114)	(0.209)	(0.170)
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y		Y		Y		Y	
Division x Age x Year Fixed Effects		Y		Y		Y		Y
State Linear Trends		Y		Y		Y		Y

Notes: Robust standard errors are clustered by states and reported in parentheses. We use the yearly CPS ASEC data from 1989-2015, where the samples are restricted to age 62-70 and collapsed by state/age/year. Estimates are weighted by the number of observations in each cell. The main explanatory variable is the log of effective minimum wage, which is defined as federal or state level minimum wage, whichever is greater. The dependent variable for columns (1) to (2) and columns (3) to (4) are the percentage beneficiaries and the mean benefits of the Social Security, respectively. The dependent variables for columns (5) to (6) and columns (7) to (8) are the percentage beneficiaries and the mean benefits of other retirement income, respectively. Other retirement income refers to pre-tax retirement, survivor, and disability pension income, other than the Social Security, that a respondent receives. For all specifications, we include state fixed effects. In columns (1), (3), (5), and (7) we include age $\times$ year fixed effects, whereas in columns (2), (4), (6), and (8), we additionally include division $\times$ age $\times$ year fixed effects and state linear trends.