CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

WILL DELAYED RETIREMENT BY THE BABY BOOMERS LEAD TO HIGHER UNEMPLOYMENT AMONG YOUNGER WORKERS?

Alicia H. Munnell and April Yanyuan Wu

CRR WP 2012-22
Submitted: September 2012
Released: October 2012

Center for Retirement Research at Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467
Tel: 617-552-1762 Fax: 617-552-0191
http://crr.bc.edu

Alicia H. Munnell is the director of the Center for Retirement Research at Boston College (CRR) and the Peter F. Drucker Professor of Management Sciences at Boston College's Carroll School of Management. April Yanyuan Wu is a research economist at the CRR. The research reported here was performed pursuant to a grant from The Pew Charitable Trusts. The opinions and conclusion expressed are solely those of the authors and do not represent the opinions or policy of Pew Charitable Trusts or Boston College. The authors would like to thank Laura Quinby and Kara Bradley for excellent research assistance. The authors would also like to thank Norma B. Coe, Matthew S. Rutledge, and Anthony Webb for their comments.

About the Center for Retirement Research

The *Center for Retirement Research at Boston College*, part of a consortium that includes parallel centers at the University of Michigan and the National Bureau of Economic Research, was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources.

Center for Retirement Research at Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467
phone: 617-552-1762 fax: 617-552-0191
e-mail: crr@bc.edu
crr.bc.edu

Affiliated Institutions:
The Brookings Institution
Massachusetts Institute of Technology
Syracuse University
Urban Institute

Abstract

Using 1977-2011 data from the *Current Population Survey*, this paper investigates the often-repeated claim that delayed retirement by baby boomers will result in higher unemployment among the young, a claim which has been garnering increased attention from the media during the Great Recession. It explores both time-series and cross-state variation, and uses state-level regressions and instrumental-variable models to determine the extent to which such "crowding out" exists in the United States. The estimates show no evidence that increasing the employment of older persons reduces the job opportunities or wage rates of younger persons. Indeed, the evidence suggests that greater employment of older persons leads to better outcomes for the young in the form of reduced unemployment, increased employment, and a higher wage. The patterns are consistent for both men and women and for groups with different levels of education. Estimates using elderly male mortality rates as instrumental variables also produce no consistent evidence that changes in the employment rates of older workers adversely affect the employment and wage rate of their younger counterparts. If anything, the opposite is true. Finally, despite the fact that the labor market downturn that accompanied the Great Recession was the most severe experienced in the post-war era, the effects of elderly employment on other segments of the labor market do not differ from those during typical business cycles.

Introduction

Between December 2007 and May 2010, the employment rate dropped by 6 percent for men ages 25-54, but less than 1 percent for workers age 55 and older. The pattern for women was equally dramatic: the employment rate dropped by 3 percent for younger women and actually increased by almost 1 percent for older women (U.S. Bureau of Labor Statistics, 2007-2010). These strikingly divergent patterns between the old and the young in labor-force behavior generated widespread media claims that delayed retirement by the baby boomers causes higher unemployment among the young.[1]

The proposition that more work by older persons reduces the job opportunities for younger persons is known as the "lump of labor theory." This notion is widely accepted in many European countries and has provided an economic rationale for early retirement programs. In the United States, economists generally reject the lump of labor theory, arguing that the labor market is dynamic and the economy can adapt to labor force changes. Nevertheless, the increased media attention and its potential influence on public policy calls for an empirical analysis.

As life expectancy increases and the retirement income system contracts, households face an enormous challenge in ensuring a secure retirement. Working longer is often hailed as the best way to increase retirement incomes (Munnell and Sass 2008). On the other hand, the ability to climb onto the first rungs of the career ladder is critical for the young; it significantly impacts their lifetime earnings and upward mobility. Therefore, understanding the relationship between older and younger persons' labor force behavior is crucial both for evaluating provisions introduced to encourage work among older Americans and for helping policymakers understand how best to improve economic opportunity among the young.

This paper uses the *Current Population Survey* (CPS) over the period 1977-2011 to investigate whether one can find any empirical support for the lump of labor theory. The

[1] *Reuters* has reported that young adults in the United States are being squeezed out of the labor force as older workers either delay retirement or seek jobs to rebuild nest eggs destroyed by the recession (Mutikani, 2010). Similar arguments appeared in *The New York Times*, *U.S. News & World Report*, *Time*, *Bloomberg*, *CNN Money*, *Insurance Journal*, and other major media. *The New York Times* claimed that the delay of seniors' retirement has made it more difficult for millions of young workers to climb onto the first rung or two of the career ladder, lowering their lifetime earnings for impeding their upward mobility (see Greenhouse 2009; Brandon 2009; Valetkevitch 2010; Dickler 2010; Cinko, McDonough, and Schlisserman 2010; Gandel 2010 for a few examples).

analysis focuses on variations across states to see if greater labor force participation of the old hurts younger workers in terms of employment, hours worked, or wages. It also looks within states over time to see if an increase in older labor force participation leads to poorer outcomes for younger workers. Additionally, this study looks for heterogeneous effects based on educational attainment, because groups with similar skills can be more easily substituted. And because labor market conditions may impact the labor supply and earnings of both older and younger persons simultaneously, the analysis includes an instrumental variables approach, where the instruments are based on elderly mortality rates, to identify the causal mechanism. Finally, the study pays special attention to the 2008 financial collapse to determine whether the relationship between employment and wage patterns of the young and old changed during the Great Recession.

The paper proceeds as follows. Section 2 summarizes the "lump of labor" debate in the economics literature. Section 3 describes the data and explores time-series and cross-state trends of labor supply across different age groups. Section 4 presents the model, outlines the empirical strategies, and discusses the evidence on "crowd out." Section 5 introduces an instrumental variables approach to identify causality in the reported relationships. The final section concludes.

The findings can be summarized as follows. Our estimates show no evidence that increasing the employment of older persons reduces the job opportunities or wage rates of young persons. Indeed, the evidence suggests that greater employment of older persons leads to better outcomes for the young in the form of reduced unemployment, increased employment, and a higher wage. The patterns are consistent for both men and women and for groups with different levels of education. Estimates using instrumental variables also produce no consistent evidence that changes in employment rates of older workers adversely affect the employment and wage rate of their younger counterparts. If anything, the opposite is true. Finally, despite the fact that the labor market downturn that accompanied the Great Recession was the most severe experienced in the post-war era, the effects of elderly employment on other segments of the labor market do not differ from those during typical business cycles.

Background

The Lump of Labor Theory. The "lump of labor" theory can be traced to Henry Mayhew's 1851 *London Labour and the London Poor*. Mayhew argued that cutting the number of hours employees worked would reduce unemployment. Starting with David Schloss in 1891, economists have repeatedly characterized this argument as a fallacy.

The fallacy of the lump of labor theory rests on the supposition that the number of jobs is limited. As Samuelson argues in his textbook, *Economics*: "It is more correct to say that an economy can adjust to create jobs for willing workers. In the long run, as prices and wages adjust to change in technology and tastes, to supplies and demands, jobs will come to workers or workers will move to jobs."

Despite the skepticism of economists, opponents of free trade, technological advance, and immigration often use the lump of labor argument to make people fearful about losing their jobs. They ignore the fact that, over the long run, technological improvements create new products and services, raise national income, and increase demand for labor throughout the economy. They also fail to acknowledge that job opportunities rise with a growing population as immigrants enter the market as consumers as well as workers.

The criticism of the lump-of-labor theory focuses on long-run market adjustments. It might be true that the theory holds in the very short run or during prolonged periods of stagnation, such as the Great Recession. That possibility will be addressed in the empirical analysis below.

Literature Review. The "lump of labor" argument frequently appears in immigration and early retirement literature, as it is often claimed that immigrant workers take jobs away from native workers and that fewer older persons in the labor force would open up more job opportunities for the young.

An extensive literature has examined the impact of immigration on the employment of native workers (see Fetter 1913, Greenwood and McDowell 1986, Borjas 2006; Card 2001, 2005 for a few examples). While relying on different data sets and methodologies, and examining different time periods, none of these studies finds evidence that immigrants crowd out natives. Similarly, research exploiting the large variation in immigrant flows across U.S. states reports little crowding out of hours between immigrants and natives (Peri 2009). And an analysis of the

impact of increased immigration on the earnings of workers who are close substitutes for immigrants concludes that immigrants are easily absorbed by the U.S. labor market, with only minor effects on native workers (LaLonde and Topel 1989).[2]

The literature on the relationship between the labor-force participation of younger and older individuals is relatively small. A series of papers examines whether employment of older individuals crowds out employment of younger individuals in 12 countries (Gruber and Wise 2010). Based on individual country and cross-country analyses, none of these international studies finds evidence that increasing the labor-force participation of older persons reduces the job opportunities of younger persons. Indeed, the evidence suggests that greater labor-force participation of older persons is associated with *greater* youth employment and reduced youth unemployment.[3]

Particularly relevant to this paper is the study in the volume by Gruber and Milligan (2008), which investigates the extent of this "crowding out" in the United States from 1962 through 2007 and finds little substitution between the young and the old. Gruber and Milligan cannot be considered the last word, however. The authors are constrained to methods and data that could be applied to all 12 countries for ease of comparison. Further, they measure the impact of elderly labor force participation only on employment of younger workers and ignore any potential impact on hours worked or wages. Moreover the period they examine was before the Great Recession. These issues will be addressed in the empirical analysis.

Data and Sample

Data. Our analysis of the labor market impacts of elderly labor-force participation uses data from the nation's largest annual labor market survey, the *Current Population Survey* (CPS). The March supplement of the CPS includes detailed questions about labor force participation,

[2] The empirical literature on how wages adjusting to an immigrant-induced labor supply shift fails to reach consensus. Some studies claim that immigration has a substantial impact on wages in receiving and sending countries (e.g.,Borjas 2003; Mishra 2007), while other studies claim the impact is negligible (Card 2005;Ottaviano and Peri 2008).

[3] One possible explanation for this positive relationship is suggested by Van Dalen and Henkens (2002), who focuses on the relationship between financing early retirement and overall labor demand. The authors find that when early retirement schemes are financed through payroll taxes, wage costs for all workers may increase, thereby reducing the total labor demand. As a result, the employment of the young and the elderly would be positively related.

wages and salaries, and income from various sources. The survey also includes rich demographic information as well as on the individual's health and work disability status. The analysis spans 1977 through 2011, which includes the Great Recession.[4]

The sample, which consists of individuals between ages 20 and 64 in the survey year, is divided into three age groups: 20-24 (the "young"), 25-54 (the "prime-aged"), and 55-64 (the "elderly"), to be consistent with the literature. The variables of interest include labor force participation (LFP), employment and unemployment, hours worked last week, and wage rates.[5] The average of each measure for each age group is calculated over time using the provided survey weights.

Time-series Trends. Figure 1.1 displays the labor force participation of the elderly and the young and the unemployment rates for the young from 1977 through 2011.[6] The top panel presents the data for the total population, the middle panel for males, and the bottom panel for females.

For the population as a whole, participation by the elderly is stable at around 55 percent until the early 1990s and rises thereafter. During the Great Recession, rather than declining, the labor force participation of the elderly actually increased by two percentage points. Participation by the young is fairly constant at around 75 percent until the early 2000s, and then declines through to 2010. Finally, the unemployment rate of the young hits its highest points in the early 1980s and again during the 2008 financial collapse. While the overall pattern does not appear to support the crowd-out hypothesis, the divergence in employment between the old and the young and the increase in the unemployment rate of the young during the Great Recession warrant further exploration.

To emphasize the sharp contrast between the employment patterns of men and women, we separate the analysis by gender. The labor force participation by elderly males displays a gentle U-shaped pattern, dropping until the late 1980s, being constant at around 67 percent

[4] The March CPS does not include state identifiers before 1977. Data for employment status are missing from 1994.
[5] The labor force participation rate is defined as a percent of the civilian noninstitutional population. The employment rate represents the share of the population over age 16 in work. The unemployment rate represents the number unemployed as a percent of the labor force.
[6] The presentation follows Gruber and Milligan (2008) for the purpose of comparison.

through 2000, and then rebounding slightly in the 2000s. Participation by young males is constant at around 80 percent through to 2000 and then declines. In contrast, participation by both young and older women increases until 2000 when it continues to rise for older women but declines for young women after 2000. The patterns also reveal that the unemployment rates for both young males and females increases dramatically during the Great Recession.

Figure 1.2 presents the employment and unemployment rates for the elderly and the prime-aged workforce age 25-54. Again, simple perusal of the data suggest little crowding out between older and prime-aged persons. While the unemployment rates of both prime-aged women and men increase during the Great Recession, the labor market behaviors of the prime-aged is less cyclical than that of the young.

To summarize the time-series analysis, the cyclicality in general and secular trend for the females appear to be much stronger than any crowd-out effect, and this is particularly true for the time period before the Great Recession. This finding is consistent with Gruber and Milligan (2008).[7] The divergent patterns between older and younger persons and the increase in the unemployment rate for younger workers in the Great Recession suggest that the relationship may have changed in this particular period.

Cross-state Trends. The substantial spatial variation in labor supply in the United States has been documented in the economic geography literature (for example, Odland and Ellis 1998 and Ward and Dale 1992). The cross-state/MSA variation in labor supply, which is as large as the widely studied variation across OECD countries, has recently drawn increased attention by economists (see Black et al 2009, Munnell et. al 2008, Pollack 2010 for a few examples). These variations afford an unexplored avenue to identify the impact of employment of older individuals on younger ones.

The variation across states is striking. In 2011, the employment rates of the elderly vary from 44 percent in Louisiana to 80 percent in North Dakota (Table 1.1). Similarly wide variation is evident in other years as well. The elderly labor supply also varies substantially over time.

[7] While our patterns of evolution are consistent with those of Gruber and Milligan (2008), we are not able to replicate their estimation results. Our estimates of labor force participation, employment and unemployment rates are consistent with what have been published by Bureau of Labor Statistics.

For example, from 1977 through 2011, the employment rate increases by 15 percentage points in Connecticut, but decreases by 6 percentage points in Louisiana.

Similar data for the young and prime-aged are shown in Tables 1.2 and 1.3. In each case, the differences across states in employment rates are large. For example, in 2011, employment rates for the young vary from 48 percent (South Carolina) to 76 percent (Nebraska). The corresponding numbers for the prime-aged is 66 percent (West Virginia) to 86 percent (North Dakota). The variation in hours worked per week is equally large. In 2011, this measure of labor supply for the elderly ranges from 20.3 hours worked per week last year (Louisiana) to 35.5 hours (North Dakota).

To explore whether crowd-out exists, Figure 2.1 plots the employment rates of the elderly against those of the young and the prime-aged for the 50 states and Washington D.C. from 1977 through 2011. Panel A, which displays the relationship for the population as a whole, shows a positive relationship between the employment rates of the elderly and the young. In fact, the correlation is positive and statistically significant, providing no support for the crowd-out hypothesis. The same pattern emerges for the males and females (Panels B and C) with a relatively steeper slope for the males. Figure 2.2 displays the same relationship between the elderly and the prime-aged. Again, nowhere do the patterns show any sign of a crowd-out effect.

Because the time-series analysis suggests that the effects of elderly employment on other segments of the labor market may differ during the Great Recession, Figures 2.3 and 2.4 focus on the period 2008-2011. Again, the relationship between outcomes for the elderly and the young and prime-aged appear to be positively related.

These simple plots do not account for other factors that could be affecting the relationship between outcomes for the young and the old. For example, if only college-educated people lived in California and only those with a high school education lived in Massachusetts, one would expect to see high levels of employment for both the old and young in California and low levels for both groups in Massachusetts. To control for these confounding factors requires regression analysis.

Direct Evidence on the Effect of Crowd-Out

Model Specifications. This section moves beyond the graphical analysis in order to include other variables that may affect the relationship between outcomes for the old and young. The basic model is of the form:

$$Y_{st} = \beta_0 + \beta_1 Elderlyemp_{st} + X_{st}\beta_2 + \gamma_t + \delta Rec + \varepsilon_{st} \quad \textbf{(1)}$$

where Y_{st} is the outcome of interest for state *s* in year *t*, such as employment and unemployment rates, hours worked, and the average wage rate and earnings of young and prime-aged individuals. The key independent variable in the regression is the state-year employment rate of the elderly ($Elderlyemp_{st}$). The vector X_{st} includes a set of state-specific, time-varying explanatory variables. These include differences in labor market conditions (such as the per-capita level of Gross State Product (GSP), GSP growth, the state average unemployment rate, the state poverty rate, and the age structure of the population), the nature of employment (the concentration of manufacturing, the concentration of the service industry, and the share of self-employment), and the state's demographic characteristics (such as the share of low educated and race composition).[8] The equation also includes a measure of the state housing price index. The regression of employment and unemployment rates also controls for local wages for the specific age group. γ_t is a set of indicator variables for years 1977-2011 to control for nationwide economic changes in any given year. Additionally, the equation includes an indicator variable, *Rec*, for the Great Recession, to capture the impact of the economic downturn on labor supply.[9] The standard errors are clustered at the state level.

Table 2 presents the descriptive statistics of the data. These statistics reflect 1785 state-level observations for 50 states and Washington D.C. from 1977-2011, with a few exceptions due to data limitations.[10] On average, the unemployment rate of the young is 11 percent, with a huge variation among states, from 6 percent to 17 percent. The within-state variation is even

[8] State unemployment rate is excluded from the model when outcome variables are age-specific unemployment/employment rates by state due a high degree of collinearity.

[9] The Recession dummy is constructed as equal to zero if before 2008 and 1 after 2008, which is not perfect collinear with year dummies.

[10] The sample size becomes small when we break down data to state-year-age-gender cells. Some estimates appear unreliable due to limited sample size. Since including an unreliable value may give invalid results, we exclude the top 1 and the bottom 1 percent of observations of outcome variables in our state-year-age-gender regressions.

larger. The average unemployment rate of the prime-aged is lower (at 5 percent) with a smaller variance. The average employment rate for the young, the prime-aged, and the elderly is 67, 78, and 57 percent, respectively. Both unemployment and employment rates are higher for the males compared to the females. Not surprising, the typical prime-aged adult works more hours per week (34 hours) than the young and earns a higher hourly wage ($20 per hour) and annual income ($31,000) than the young.

Measures of demographics also vary considerably. For example, the share of the population ages 20-24 is 11 percent on average, but varies between 9 and 15 percent. The share of high school and less population varies between 43 and 70 percent. The fraction of blacks varies between 0 and 66 percent. Between 3 and 26 percent of the state is employed in manufacturing jobs, and between 6 and 18 percent is self-employed.

The "Crowding Out" Effect on Quantity: Labor Force Participation and Hours Worked. Table 3.1 displays the Ordinary Least Square (OLS) regression results of equation (1) when men and women are pooled together. The first column has the results for youth unemployment. If crowding out were occurring, an increase in elderly employment would increase youth unemployment. However, the coefficient is strongly negative: a 1-percentage-point increase in the elderly employment rate is associated with a decline in youth unemployment of about 0.11 percentage points. Most of the other controls have coefficients in the expected direction, albeit often insignificant. In terms of significant effects, the state poverty level increases and high housing prices and rapid GSP growth reduce state-level youth unemployment. Further, youth unemployment increases significantly during the Great Recession.

The third column presents the results for youth employment. Again, no sign of crowd out is evident. Instead a 1-percentage-point increase in the elderly employment rate is associated with a 0.21 percentage points increase in youth employment. This finding strongly contradicts the crowd-out hypothesis.

In addition to employment/unemployment, equations are also estimated to measure the impact of the elderly employment rate on hours worked. The results are summarized in the fifth column of Table 3.1. Again, employment of the elderly is strongly positively related to hours worked by the young: a 1 percentage point increase in the elderly employment rate is predicted to increase hours worked per week by the young by 0.13 percent.

Table 3.1 also presents the results for the prime-aged. The same pattern emerges for them as for the young: instead of finding any crowding out, employment of the elderly leads to a decrease in unemployment, an increase in employment, and an increase in hours worked by the prime-aged. The results are statistically significant.

The strong positive relationship between the employment of the elderly and the outcomes for the young are surprising and counterintuitive. One possibility is that the variables included in the equation do not fully account for the differences among states. That is, omitted variables may be biasing the estimates. One approach to solving this problem is to introduce state controls. The equation then becomes:

$$Y_{st} = \beta_0 + \beta_1 Elderlyemp_{st} + X_{st}\beta_2 + \gamma_t + \delta Rec + U_s + \varepsilon_{st} \quad \textbf{(2)}$$

where *Us* represents a set of state controls.

Including a set of state controls in the equation isolates the effects of changing economic conditions on labor force participation from the largely structural influences that vary across states. The price of the approach is that the variation tends to be less dramatic than the differences across states, which is not surprising as many of the demographic, industry structure, and labor market conditions found to be influential in explaining variations across states do not change rapidly. Fortunately, as highlighted in Table 2, Column 5, the within-state deviation in most of the variables is substantial. Further, the state fixed-effects are significant and the Hausman test suggests that a fixed-effects model is more appropriate than a random-effects model.[11]

The results from the regression with state-fixed effects are shown in the even-numbered columns. As expected, the fixed-effect model reduces the size of the coefficients. While within-state changes in employment of the elderly continue to have a negative impact on unemployment of youth and prime-aged and a positive impact on their employment and hours worked, the magnitude of the coefficients is reduced and only two of the six coefficients are statistically significant at the 5-percent level. Thus, when controls are introduced for the state specific

[11] The Hausman test is the standard procedure used in empirical panel data analysis in order to discriminate between the fixed effects and random effects model.

characteristics, with an exception for employment, elderly employment has no impact on unemployment and hours worked for both the young and prime-aged.

With state fixed effects, state poverty levels and the movement of housing prices again significantly impact labor market behaviors of the young and the prime-aged. Also, consistent with the literature, an increasing proportion of manufacturing jobs is associated with an increase in employment of both the young and the prime-aged, likely reflecting job opportunities for low-skilled workers. At the same time, self-employment is negatively associated with youth employment and hours worked. In addition, more service jobs lead to a reduction of hours worked by both the young and the prime-aged; this is expected as jobs in these industries are more likely to be part-time or have flexible hours. Finally, not surprising, the Great Recession strongly negatively impacts the labor market behaviors of both youth and prime-aged.

Two control variables have different impacts on the young and the prime aged. First, the share of same-age population increases the hours worked by the young but has no impact on the prime-aged. The positive coefficient suggests an endogenous migration story: workers move to the states with better job prospects for their age group. It appears that endogenous migration plays a stronger role for the young than for the prime-aged. Second, a higher local average wage has little impact for the young but is associated with increased unemployment and decreased employment for the prime-aged. This relationship can occur if large labor market exits occur from the bottom of the income distribution during recessions.[12]

To account for the secular trend increase in female labor supply over time, separate results for men and women are shown in Tables 3.2.[13] These results are largely consistent with the aggregate analysis. The magnitudes of the coefficients on employment of the elderly are sometimes higher and sometimes lower, and significance fails in some cases. However, for both

[12] For the young, real wages have displayed a modest cyclicality (see Lucas 1977, Mankiw 1989, and Blanchard and Fischer 1989 for a few examples). In contrast, a selection story is more likely for prime-aged workers: while the measure of wage is constructed as the average of non-zero wages, a countercyclical impact is possible if there is a large increase in labor force exit, particularly from the bottom of the wage distribution (Solon, Barsky, and Parker, 1994).

[13] Table 3.2 presents selected coefficient estimates. The full regression results are available upon request from the authors.

the males and females, the results show no evidence of a crowd-out. If anything, employment of the elderly is positively associated with employment of the young and the prime-aged.[14]

The "Crowding Out" Effect on Price: Wage Rates. In addition to exploring the effect of older workers on the "quantity" of younger workers, regressions are estimated to examine the effect on the "price" of younger workers – that is, their wages. If crowd-out of the young by the old does exist, younger workers may confront reduced earnings due to an increased supply of labor of the old. Two measures of "price" are used: log hourly wage and log annual income. The explanatory variables are the same as in the earlier equations.

The results are shown in Table 4.1. Instead of a negative correlation between employment of the old and the "price" of younger workers, the results again show some positive impacts in both the equations with and without state variables. In state fixed-effects models, while employment of older workers has no significant impact on the hourly wage and annual income of the young, a 1-percentage-point increase in the elderly employment rate is predicted to increase hourly wage rate of the prime-aged by 0.08 percent and annual income of these workers by 0.11 percent. The coefficients on the other controls are largely consistent with those of the "quantity" analysis.

A few findings are worth a comment. First, an increasing proportion of high-school and less educated individuals is associated with declines in the hourly wage and annual income of both young and prime-aged workers, reflecting returns to education. Second, while the increasing prevalence of self-employment is related to declines in annual income for both young and prime-aged workers, it is positively correlated with hourly wages for the prime-aged. This finding is consistent with the literature that the self-employed on average have lower initial earnings and earnings growth than their counterparts (Hamilton 2000). On the other hand, given the fact that the self-employed are more likely to have part-time work, flexible hours and less generous fringe benefits, a higher hourly wage rate seems reasonable. In addition, an increase in the share in manufacturing is related to a decline in hourly wage rate, probably due to employee –characteristics – low-skilled workers are concentrated in manufacturing.

[14] We also estimated equations excluding the wage controls to address concerns that wages are endogenous. The results are summarized in Appendix table 1. The coefficients are largely consistent.

Tables 4.2 breaks out the results for males and females, respectively.[15] The results are largely consistent with those of the aggregated analysis. For the males, two of the four coefficients are positive and statistically significant. For the females, one of the four is positive and significant. The message is clear: no evidence supports the contention that the employment of the old reduces the wages of the young.

Does the Relationship Differ During the Great Recession? The Great Recession is generally acknowledged to be the worst crisis since the Great Depression, resulting in a dramatic increase in unemployment. While a fundamental flaw underlying the lump-of-labor theory is that it ignores long-run labor market adjustments, short-run effects could be differ from long-run effects. That is, when employment overall is dropping, crowd-out between different groups might be possible.

We estimate a specification where all variables in X_{st} are interacted with Rec, to allow for differential impact of the Great Recession at labor market behaviors:

$$Y_{st} = \beta_0 + \beta_1 Elderlyemp_{st} + \beta_3 Elderlyemp_{st} Rec + \delta Rec + X_{st}\beta_4 + \beta_5 X_{st} Rec + \gamma_t + U_s + \varepsilon_{st} \quad \textbf{(3)}$$

The results are shown in Table 5.1. If elderly employment were affecting the unemployment rates of the young during the Great Recession, the coefficient of the interaction term should be positive and statistically significant. Instead, it is insignificant. The pattern holds for employment and hours worked. For the young, the only evidence that the relationship changes during the Great Recession contradicts the crowd-out hypothesis. During the Great Recession, a 1-percentage-point increase in the elderly employment rate is associated with an increase hourly wage rate of the young by an additional 0.28 percent compared to the typical business cycle.

[15] Table 4.2 presents selected coefficient estimates. The full regression results are available upon request from the authors.

Similar patterns emerge for the prime-aged — that is, negative effects for the unemployment rate and positive associations for employment and hours worked during the Great Recession compared to the period before. The only evidence that is consistent with the crowd-out hypothesis pertains to the wage rate estimation of the full interaction model: while a 1-percentage-point increase in employment by the elderly is associated with a 0.09 percent increase in the wage rate in the typical business cycle, the impact becomes a 0.20 percent decrease in the Great Recession.

The results by gender (Table 5.2) are largely consistent.[16] For males, the estimates provide no evidence of any crowding out during the Great Recession. Instead, during the Great Recession, employment of older males has an even more positive impact on the various labor market outcomes of younger males. For females, the results provide some indication of crowd-out: increasing employment of older females is associated with declines in the wage rates of prime-aged females and increases in unemployment of young females.

Most of the estimated coefficients on the control variables interacted with the Great Recession are in the expected direction. A few estimates are worth commenting on. First, while an increasing share of jobs in manufacturing is generally associated with an increase in employment of both the young and the prime-aged, this effect declines and even become negative during the Great Recession. Since manufacturing jobs tend to be concentrated among low-skilled workers, and young workers are more likely to be low-skilled, the cyclicality of these jobs may help explain why the young are hardest hit by the Great Recession. Second, during the Great Recession, real wages for the young are positively correlated with their unemployment, probably suggesting a large exit of the low-paid young from the labor market.

Differential Impacts by Education Groups. The potential for older workers to crowd out younger ones should depend on the extent to which they are substitutes. Economic theory suggests that the more similar the groups are with respect to skills, the greater the degree of substitution. Therefore, this section explores whether the effects are different by education groups. Table 6.1 summarizes the results for those with high-school-and-less education. For the

[16] Table 5.2 presents selected coefficient estimates. The full regression results are available upon request from the authors.

young, the coefficients of elderly employment, with one exception, are statistically insignificant. The only significant estimate suggests that more low-educated elderly employment leads to an increase in employment of low-educated young persons. For the prime-aged, the message is again that elderly employment has no effect on labor market outcomes for the prime-aged.

Table 6.2 displays the results for those with college-and-above. Again, the results provide no support for the crowd-out hypothesis. In short, the relationship between older and younger persons' labor-force behavior does not vary by educational attainment.

Sensitivity Tests. This section tests the robustness of the state-fixed effects findings in three ways. First, to avoid the impact of any contemporary shock affecting both sides of the equation, the labor supply behavior and wage rates of youth and prime-age persons in a given year are regressed on the employment of older persons three years earlier. Second, to account for the fact that large and small states are given equal weighs in the analysis, which could produce inefficient estimates of coefficients, the equations are re-estimated using a feasible Generalized Least Squares (GLS) procedure. Third, to address the potential problem of limited size when breaking down data to state-year-age cells, the data are pooled across three years to maintain an adequate sample size.

The results of the sensitivity tests are summarized in Table 7. Each cell reports the coefficient on elderly employment from a separate regression. The estimations across different specifications are largely consistent with the results reported earlier, with the magnitude of coefficients from the pooled-three-year model being generally larger. Looking at the unemployment rate of the young in the first column, the coefficients down the column are negative and none is statistically significant. In terms of employment shown in the second column, more elderly employment leads to an increase in youth employment, with three of the four coefficients being significant at 5 percent level. The same pattern emerges as for the prime-aged, the males, and the females. None of the results support the crowd-out hypothesis.

Instrumental Variable Approach

Instrumental Variable. Even when controlling for the various determinants of general unemployment, the approach described in the previous section is difficult to interpret in terms of a causal impact of older persons' employment on labor-force activity of younger workers. If

some unobserved factors have simultaneous impacts on the unemployment of younger workers and on the labor-force participation of older workers, then an endogeneity problem can arise. For instance, a positive technology or investment shock in a state may simultaneously boost employment of both older and younger workers. In such cases, OLS would be biased toward a positive value. To address this problem and to obtain unbiased estimates, the following analysis employs an instrumental variable approach.

The goal is to identify an instrumental variable that 1) is correlated with employment of older workers (instrument relevance) and 2) has no direct impact on the employment of the younger cohort (exclusion restriction) State-year-age specific mortality rates satisfy both criteria. The association between individuals' employment behavior and health status are well-established in the literature. For instance, involuntary retirements are often due to negative health shocks (Haider and Stephens 2007; Smith 2006; Hurd and Rohwedder 2003, 2008), and poor health status among older workers is strongly correlated with early exit from the labor market (McGarry 2004). The own-age group mortality rate has been widely suggested to be strongly associated with one's own group health status and, thus, it is related to own-group employment. Further, Stevens et al. (2011) report that own group mortality is negatively correlated with one's own group employment rate.

Pro-cyclical mortality rates are also well-documented in the literature. For instance, Ruhm (2000) reports that a 1-percentage point increase in a state's unemployment rate leads to a 0.54 percent reduction in that state's mortality rate. This raises concerns about the exclusion restriction. If the mortality rate picks up the impact of the business cycle then a simultaneous equation bias occurs again.[17] Fortunately, the literature offers little support that one group's mortality is related to another group's employment. Stevens et al. (2011) also provide some evidence on the independence of older mortality rates and the work status of younger workers.[18]

[17] Other possible sources of concerns include the quality of health care in the area and the educational or racial composition of the population. Fortunately, state controls are included in our TSLS estimation. Therefore, any state-level time-invariant factors that may simultaneously impact both elderly and young's health are controlled for.
[18] In addition, we conducted a reduced-form estimation with elderly mortality rate as an independent variable. The results show that there is not statistically significant relationship between the elderly mortality rate and the labor supply of the young/prime age (appendix table 2).

The measure of the mortality rate is based on death counts from Vital Statistics publications. The data, which are available from 1979-2008, are used to construct state-level death counts by age and sex.

TSLS Estimates. Once the instrument is constructed, the next step is to estimate a Two Stage Least Squares (TSLS) model. The first stage estimates the effect of state-year mortality rates on the employment rate of the elderly, $Elderlyemp$:

$$Elderlyemp_{st} = a_0 + a_1 MT_{st} + X_{st}\beta_2 + \gamma_t + U_s + \varepsilon_{st} \quad \textbf{(4)}$$

As opposed to using the mortality rates of all individuals age 55-64, we use the mortality rates of male age 55-64 for larger variation across state over time. Thus, MT_{st} represents the natural log of the mortality rate in state s and year t of the males age 55-64.

In the second stage, the predicted value of elderly employment from the first stage is substituted for actual elderly employment.

$$Y_{st} = \beta_0 + \beta_1 \widehat{Elderlyemp}_{st} + X_{st}\beta_2 + \gamma_t + U_s + \varepsilon_{st} \quad \textbf{(5)}$$

Where $\widehat{Elderlyemp}_{st}$ is the predicted employment rate of the elderly. In both equation (4) and (5), *X* includes a set of state-specific, time-varying explanatory variables as specified in equation (2). Since the literature suggests that the mortality rates of young adults are more sensitive to the business cycle, the natural log of the mortality rates of young (prime-aged) individuals are also included as a control.

The results from estimating equation (4) and (5) for unemployment, employment, hours worked, and wage rates are summarized in Table 8. Even if instruments are relevant, they might be weak. In that case, instrumental variable estimates may be inconsistent and imprecisely measured. Therefore, Table 8 also reports the first stage results and the F statistic, which tests whether the coefficient of the instrument is zero.

The first stage results show that the instrument tends to have the expected sign and is statistically significant – that is, male mortality rates of the elderly are negatively correlated to their employment. For instance, in the regression for younger worker's unemployment, a 1-

percent increase in the elderly male's mortality rates is predicted to decrease employment of older workers by 0.09 percentage points. The first stage results also show that with the exception of women, the instrumental variable is strong with the F-statistics over 10.

For young workers, compared to the results without correcting for endogeneity, all coefficients switch signs, though none is significant. The coefficients and their standard errors tend to be very large, which is typical in instrumental variables estimation. The message is clear and consistent with what we report in previous sections that there is no evidence of a crowd-out effect. The effect of employment of older workers on the employment and wage patterns of the young is best summarized as absent.

For the prime-aged, the instrumental variable estimates are largely consistent with the OLS estimates: all four coefficients display the same sign with larger magnitude. Instead of finding a crowd-out effect, increased employment of the elderly positively impacts the employment of the prime-aged and leads to an increase in hours worked by this group. Turning to Panel B for the males, all of the instrumental variable estimates are large, and six of the eight are insignificant. But two instances produce statistically significant coefficients. First, increased elderly male employment leads to a decline in hours worked by young males, but the effect is only significant at 10 percent level. On the other hand, a 1-percentage-point increase in elderly male employment leads to a 0.34 point increase in employment of prime-aged males. This result strongly undermines the notion of a trade-off between old and young employment.

For the females, Panel C provides no evidence of crowd-out. Rather, employment of older women positively impacts employment and hours worked by prime-aged women. Since the mortality rates do not provide a powerful instrument for employment by older women (the F-statistic is less than 10), the result could mean either that no systematic effect exists or that the instruments do not allow precise estimates.

To summarize, the TSLS estimates provide no evidence that changes in employment rates of older workers adversely affect the employment rate of the young.

Conclusion

This paper uses interstate and within-state variation to see if increasing the employment of older persons reduces the job opportunities or wage rates of young persons. The results show no evidence of crowd out of the young by the elderly that would support the lump-of-labor

theory. In fact, the evidence suggests that greater employment of older persons leads to better outcomes for the young —reduced unemployment, increased employment, and a higher wage. The patterns are consistent for both men and women and for groups with different levels of education. Because the positive results could reflect general labor market conditions that impact both the young and the old, an instrumental variables model is employed. The instrumental variable approach does not produce any consistent evidence that changes in the employment rates of older workers adversely affect the employment and wage rate of their younger counterparts. If anything, the opposite is true. Finally, the effects of elderly employment on other segments of the labor market during the Great Recession do not differ from those during typical business cycles.

Convincing employers and policymakers that the lump-of-labor theory does not hold is extremely important, given the condition of the U.S. retirement system and the need for people to work longer in order to have a secure retirement. Employers already have reservations about older workers, so adding the false argument that retaining older workers hurts younger ones could impede the ability of older workers to remain in the labor force. Therefore, public discourse will be improved by putting the lump-of-labor theory to rest. The theory may sound plausible, but the data do not support it.

References

Brandon, Emily. 2009. "Delayed Retirement May Mean Fewer Job Openings." *U.S. News & World Report*, September 3. Available at: http://money.usnews.com/money/blogs/planning-to-retire/2009/09/03/delayed-retirement-may-mean-fewer-job-openings.html.

Black, Dan, Natalia Kolesnikova, and Lowell J. Taylor. 2007. "Why Do So Few Women Work in New York (and So Many in Minneapolis?) Labor Supply of Married Women Across U.S. Cities." Federal Reserve Bank of St. Louis Working Paper.

Blanchard, Oliver J. and Stanley Fischer. 1989. *Lectures on Macroeconomics.* Cambridge, MA: MIT Press.

Borjas, George J. 2006. "Native Internal Migration and the Labor Market Impact of Immigration." *Journal of Human Resources*, 41(2): 221-258.

Card, David. 2001. "Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration." *Journal of Labor Economics*, 19(1): 22-64.

Card, David. 2005. "Is the New Immigration Really So Bad?" *The Economic Journal*, 115(507): F300-F323.

Compton, Janice and Robert Pollak. 2011. "Family Proximity, Childcare, and Women's Labor Force Attachment." National Bureau of Economic Research Working Paper 17678.

Cinko, Andrew, Michael McDonough, and Courtney Schlisserman. 2010. "Workers of 65 Vie with Teens in Labor Market for First Time Since Truman." *Bloomberg*, July 13. Available at: http://www.bloomberg.com/insight/teens.html.

Dickler, Jessica. 2010. "Battle Brews Over Hourly Jobs." *CNN Money*, February 2. Available at: http://money.cnn.com/2010/02/02/news/economy/hourly_jobs/.

Fetter, Frank A. 1913. "Population or Prosperity: Annual Address of the President." *The American Economic Review* 3(1): 5-19.

Friedberg, Leora and Anthony Webb. 2005. "Retirement and the Evolution of Pension Structure." *Journal of Human Resources* 40(2): 281-308.

Gandel, Stephen. 2010. "In a Tough Job Market, Teens Are Suffering Most." *Time*, January 18. Available at: http://www.time.com/time/magazine/article/0,9171,1952331-1,00.html.

Greenhouse, Steven. 2009. "Young and Old Are Facing Off for Jobs." *New York Times*, March 20. Available at: http://www.nytimes.com/2009/03/21/business/21age.html?_r=1.

Greenwood, Michael J. and John M. McDowell. 1986. "The Factor Market Consequences of U.S. Immigration." *Journal of Economic Literature* 24(4): 1738-1772.

Gruber, Jonathan and David A. Wise, eds. 2010. *Social Security Programs and Retirement around the World: The Relationship to Youth Employment.* Chicago, IL and London: The University of Chicago Press.

Gruber, Jonathan and Kevin Milligan. 2008. "Do Elderly Workers Substitute for Younger Workers in the United States?" In *Social Security Programs and Retirement around the World: The Relationship to Youth Employment*, edited by Jonathan Gruber and David A. Wise, 345-360. Chicago, IL and London: The University of Chicago Press.

Gruber, Jonathan and Jeffrey D. Kubik. 1997. "Disability Insurance Rejection Rates and the Labor Supply of Older Workers." *Journal of Public Economics* 64(1): 1-23.

Haider, Steven J. and Melvin Stephens Jr. 2007. "Is There a Retirement-Consumption Puzzle? Evidence Using Subjective Retirement Expectations." *The Review of Economics and Statistics*, 89(2): 247-264.

Hamilton, Barton H. 2000. "Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment." *Journal of Political Economy*, 108(3): 604-631.

Hurd, Michael and Suann Rohwedder. 2008. "The Retirement Consumption Puzzle: Actual Spending Change in Panel Data." National Bureau of Economic Research Working Paper 13929.

Hurd, Michael and Susann Rohwedder. 2003. "The Retirement Consumption Puzzle: Anticipated and Actual Declines in Retirement Spending." National Bureau of Economic Research Working Paper 9586.

LaLonde, Robert J. and Robert H. Topel. 1991. "Labor Market Adjustments to Increased Immigration." In *Immigration, Trade, and the Labor Market*: 167-200. Chicago: University of Chicago Press.

Lucas Jr., Robert J. 1977. "Understanding Business Cycles." *Carnegie-Rochester Conference Series on Public Policy*, 5: 7-29.

Mankiw, N. Gregory. 1989. "Real Business Cycles: A New Keynesian Perspective," The Journal of Economic Perspectives 3(3): 79-90.

Mayhew, Henry. 1864. "Skilled and Unskilled Labour." In *London Labour and the London Poor: The Condition and Earnings of Those that Will Work, Cannot Work, and Will Not Work*, 3: 231-241. London: Charles Griffen and Company.

McGarry, Kathleen. 2004. "Health and Retirement: Do Changes in Health Affect Retirement Expectations?" *Journal of Human Resources*, 39(4): 624-648.

Munnell, Alicia H. and Steven A. Sass. 2008. *Working Longer: The Solution to the Retirement Income Challenge.* Washington, DC: Brookings Institution Press.

Munnell, Alicia H., Mauricio Soto, Robert K. Triest, and Natalia A. Zhivan. 2008. "How Much Do State Economics and Other Characteristics Affect Labor Force Participation of Older Workers?" Working Paper 2008-12. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Mutikani, Lucia. 2010. "Older, Young U.S. Workers Jostle for Scarce Jobs." *Reuters*, April 7. Available at: http://www.reuters.com/article/idUSTRE63646920100407.

Odland, John and Mark Ellis. 1998. "Variations in Labour Force Experience of Women Across Large Metropolitan Areas in the United States." *Regional Studies* 32(4): 333-347.

Peri, Giovanni and Chad Sparber. 2009. "Task Specialization, Immigration, and Wages." *American Economic Journal: Applied Economics*, 1(3): 135-169.

Ruhm, Christopher J. 2000. "Are Recessions Good For Your Health?" *The Quarterly Journal of Economics*, 115(2): 617-650.

Samuelson, Paul and William Nordhaus. 2004. *Economics*. New York: McGraw-Hill.

Schloss, David F. 1891. "Why Working-Men Dislike Piece-Work." *Economic Review*, 1(3): 311-326.

Smith, Sarah. 2006. "The Retirement-Consumption Puzzle and Involuntary Early Retirement: Evidence from the British Household Survey." The Economic Journal, 116(510): C130-C148.

Solon, Gary, Robert Barsky, and Johnathan A. Parker. 1994. "Measuring the Cyclicality of Real Wages: How Important is Composition Bias?" *The Quarterly Journal of Economics*, 109(1): 1-25.

Stevens, Ann Huff, Douglas L. Miller, Marianne E. Page, and Mateusz Filipski. 2011. "The Best of Times, The Worst of Times: Understanding Pro-Cyclical Mortality." National Bureau of Economic Research Working Paper 17657.

U.S. Bureau of Labor Statistics. *Current Population Survey*, 1990-2010. Washington, DC.

Valetkevitch, Caroline. 2010. "Older Workers Sticking with Jobs; Employment for Youngest Falls." *Insurance Journal*, April 9. Available at: http://www.insurancejournal.com/news/national/2010/04/09/108893.htm.

Van Dalen, Hendrik P. and Kene Henkens. 2002. "Early Retirement Reform: Can it and Will it Work?" *Ageing & Society* 22: 209–231.

Ward, Clare and Angela Dale. 1992. "Geographical Variation in Female Labour Force Participation: An Application of Multilevel Modelling" *Regional Studies*, 26(3); 243-255.

Figure 1.1 Evolution of Labor Force Participation for the Elderly and the Young

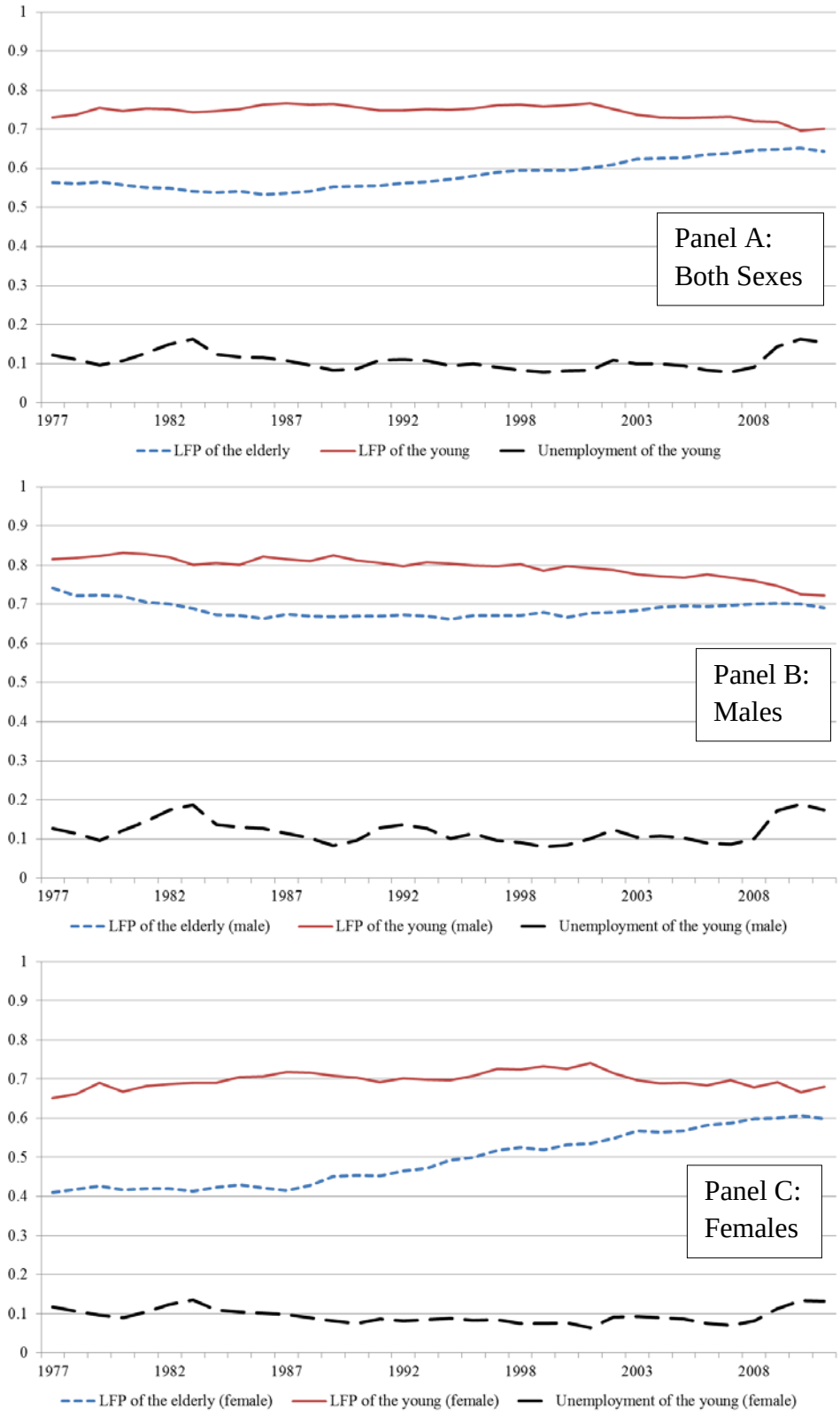


Figure 1.2 Evolution of Labor Force Participation for the Elderly and the Prime-aged

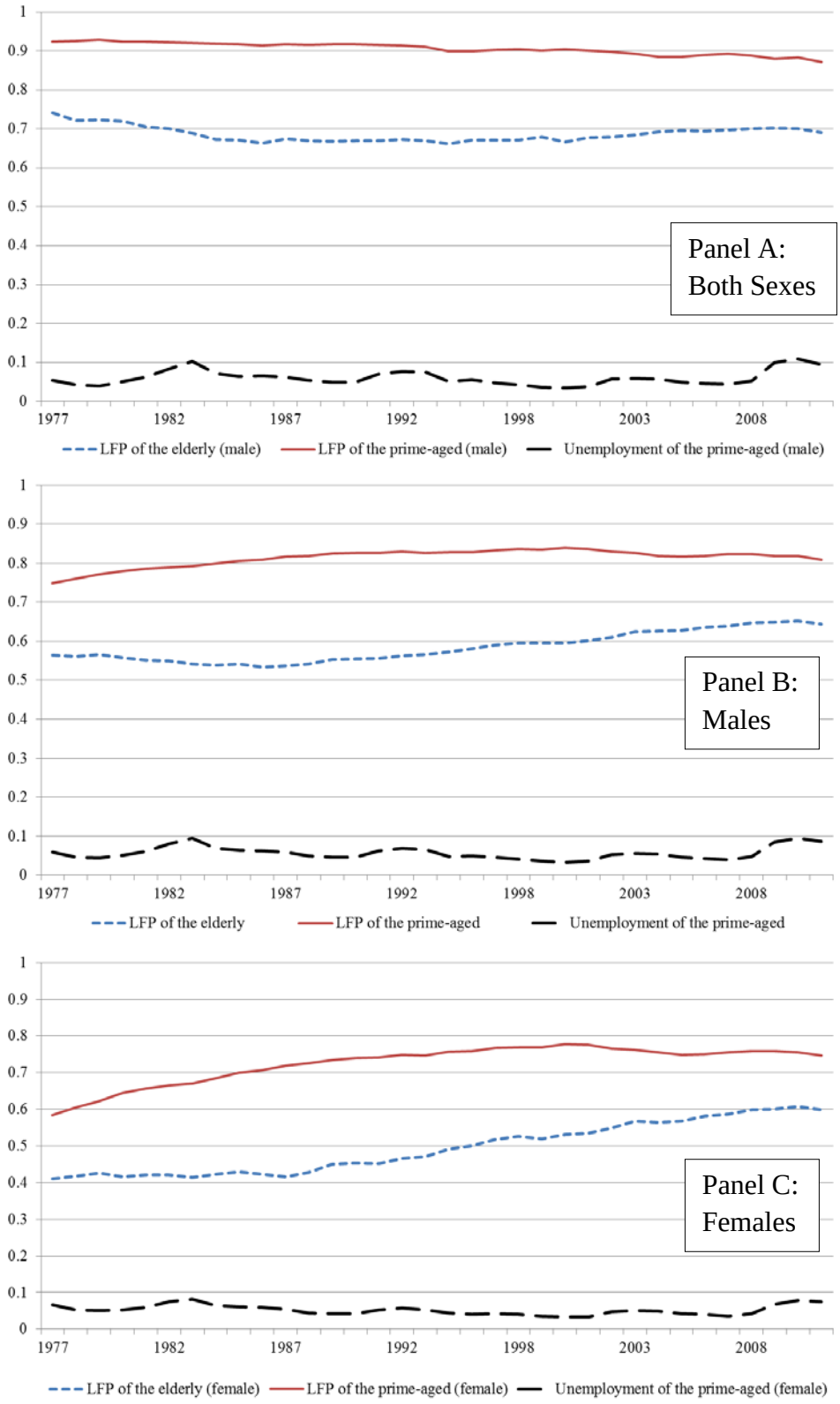


Figure 2.1 Employment rates of the elderly and young by state over time

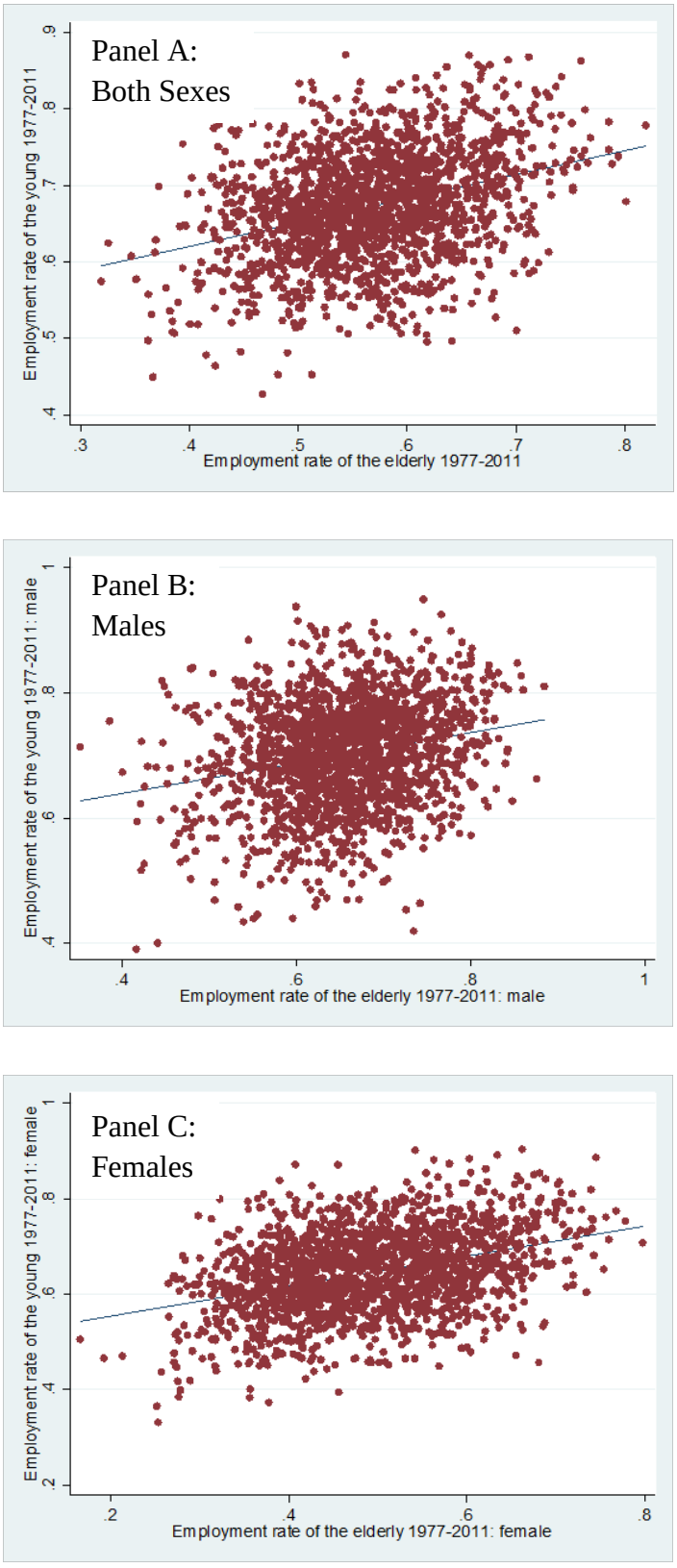


Figure 2.2 Employment rates of the elderly and prime-aged by state over time

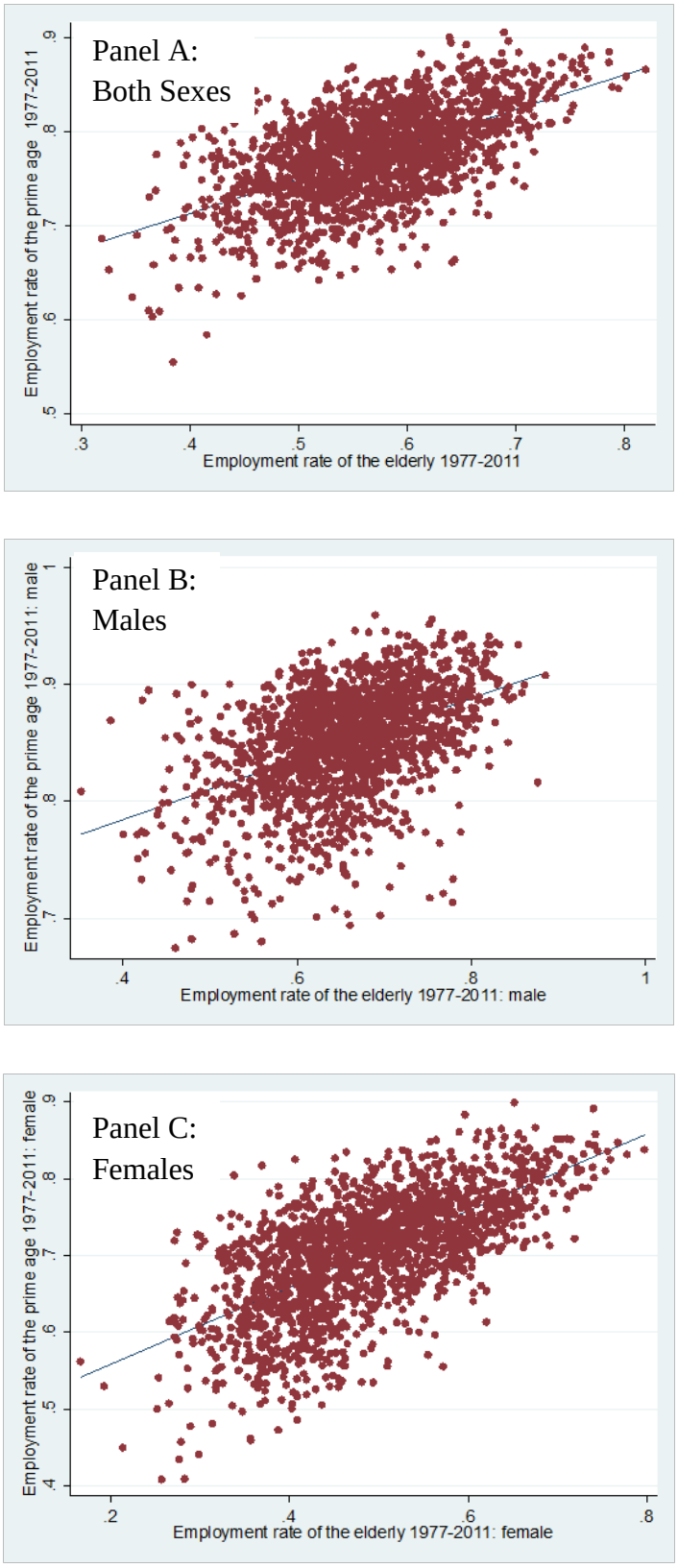
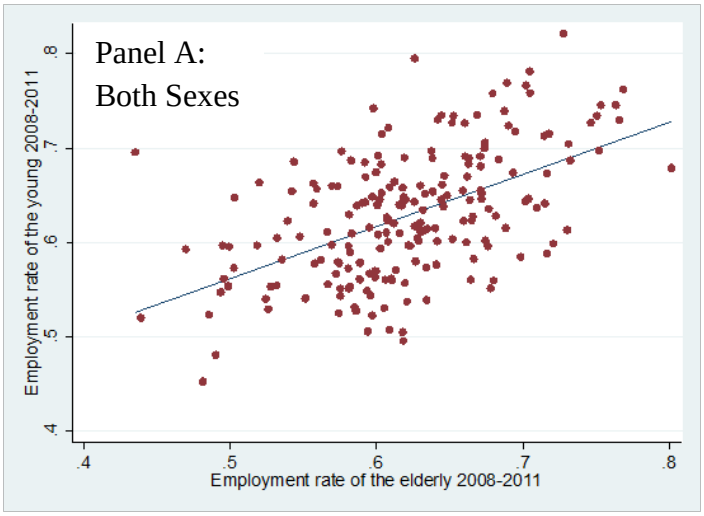
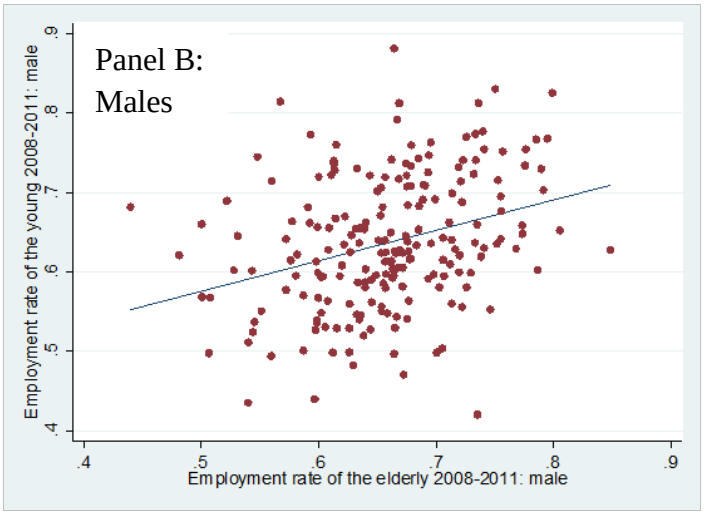


Figure 2.3 Employment rates of the elderly and young by state during the recession





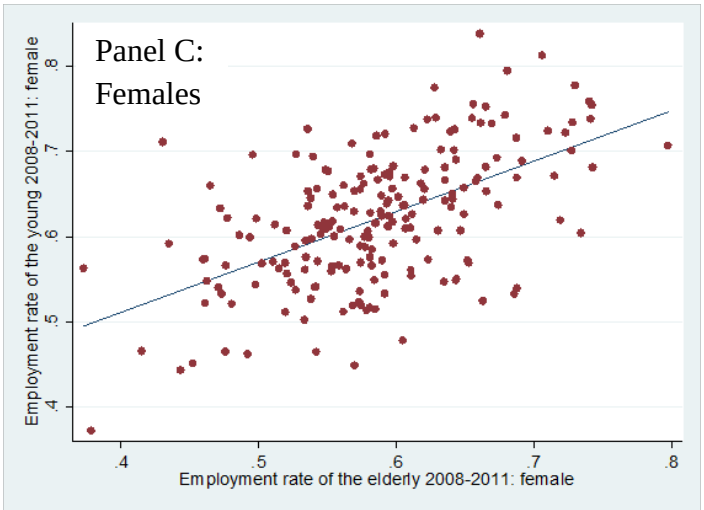
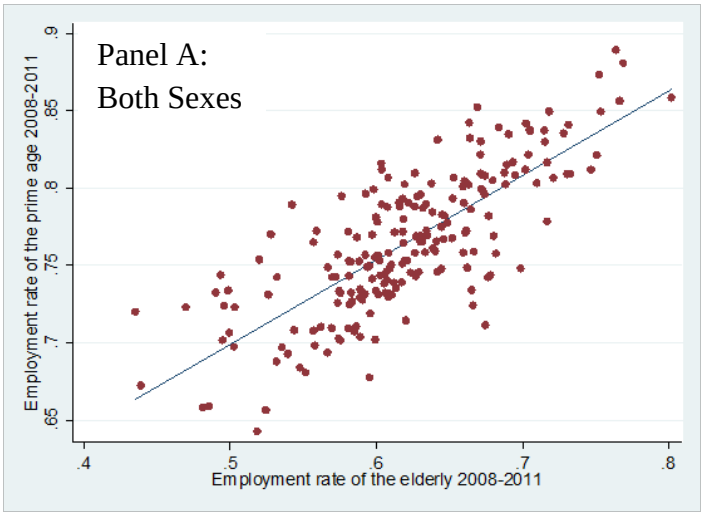
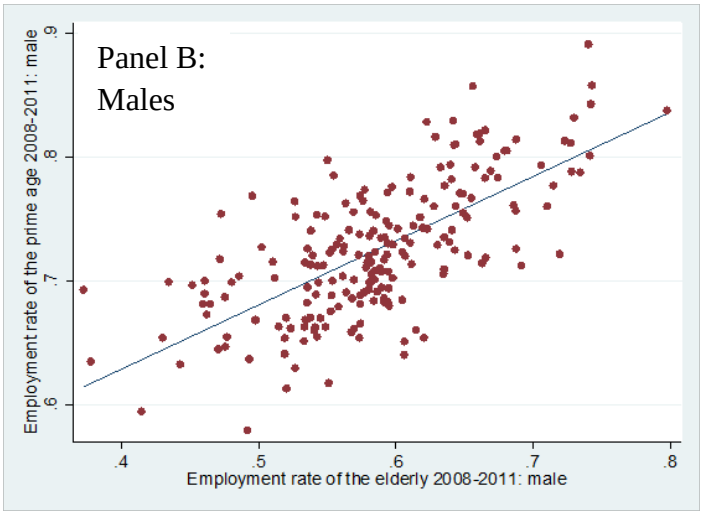


Figure 2.4 Employment rates of the elderly and prime-aged by state during the recession





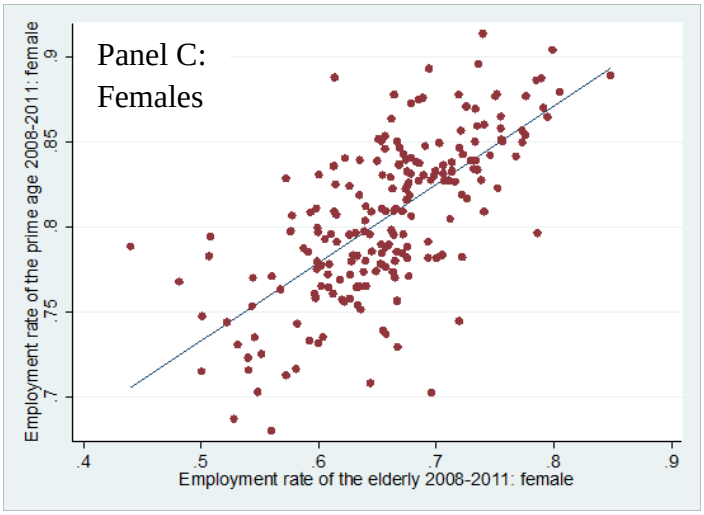


Table 1.1 Labor force participation rates of the elderly

State	CPS Year				
	2011	2000	1990	1980	1977
AK	0.59	0.71	0.54	0.64	0.61
AL	0.55	0.54	0.40	0.51	0.45
AR	0.54	0.48	0.50	0.50	0.51
AZ	0.58	0.49	0.41	0.44	0.45
CA	0.59	0.59	0.55	0.50	0.52
CO	0.63	0.70	0.56	0.57	0.55
CT	0.72	0.65	0.64	0.68	0.57
DC	0.62	0.69	0.57	0.52	0.55
DE	0.63	0.62	0.49	0.60	0.54
FL	0.61	0.56	0.51	0.48	0.45
GA	0.56	0.56	0.49	0.56	0.52
HI	0.68	0.71	0.61	0.59	0.63
IA	0.73	0.64	0.61	0.61	0.62
ID	0.59	0.67	0.51	0.49	0.55
IL	0.63	0.62	0.56	0.62	0.61
IN	0.58	0.60	0.51	0.61	0.52
KS	0.62	0.72	0.68	0.69	0.65
KY	0.56	0.52	0.53	0.47	0.48
LA	0.44	0.49	0.46	0.49	0.50
MA	0.62	0.68	0.57	0.61	0.61
MD	0.59	0.61	0.55	0.55	0.55
ME	0.58	0.64	0.56	0.53	0.55
MI	0.50	0.53	0.45	0.51	0.52
MN	0.64	0.66	0.67	0.60	0.55
MO	0.57	0.60	0.61	0.53	0.54
MS	0.50	0.52	0.49	0.52	0.53
MT	0.63	0.62	0.53	0.55	0.54
NC	0.57	0.55	0.53	0.51	0.53
ND	0.80	0.68	0.67	0.57	0.60
NE	0.70	0.72	0.60	0.61	0.57
NH	0.72	0.70	0.63	0.62	0.61
NJ	0.68	0.64	0.62	0.58	0.52
NM	0.53	0.55	0.45	0.51	0.51
NV	0.58	0.52	0.58	0.56	0.59
NY	0.61	0.55	0.54	0.54	0.55
OH	0.62	0.58	0.51	0.56	0.56
OK	0.61	0.53	0.58	0.55	0.57
OR	0.63	0.54	0.47	0.53	0.53
PA	0.61	0.61	0.51	0.51	0.52
RI	0.61	0.59	0.50	0.57	0.53
SC	0.49	0.46	0.53	0.39	0.50
SD	0.66	0.69	0.58	0.68	0.66
TN	0.57	0.55	0.51	0.43	0.49
TX	0.60	0.57	0.53	0.52	0.56
UT	0.66	0.56	0.52	0.64	0.55
VA	0.63	0.56	0.53	0.54	0.59
VT	0.75	0.68	0.62	0.52	0.48
WA	0.61	0.57	0.51	0.49	0.50
WI	0.66	0.58	0.60	0.61	0.62
WV	0.49	0.42	0.38	0.39	0.41
WY	0.69	0.61	0.52	0.60	0.58
10th percentile	0.53	0.52	0.46	0.48	0.48
25th percentile	0.57	0.55	0.51	0.51	0.52
50th percentile	0.61	0.59	0.53	0.55	0.55
75th percentile	0.64	0.66	0.58	0.60	0.58
90th percentile	0.70	0.70	0.62	0.62	0.61

Table 1.2 Labor force participation rates of the young

State	CPS Year				
	2011	2000	1990	1980	1977
AK	0.64	0.60	0.59	0.55	0.52
AL	0.61	0.69	0.65	0.61	0.58
AR	0.69	0.62	0.66	0.67	0.61
AZ	0.53	0.70	0.64	0.68	0.58
CA	0.56	0.68	0.68	0.70	0.61
CO	0.61	0.77	0.72	0.73	0.65
CT	0.59	0.70	0.73	0.70	0.62
DC	0.50	0.62	0.70	0.59	0.51
DE	0.54	0.79	0.75	0.65	0.59
FL	0.56	0.71	0.70	0.70	0.67
GA	0.58	0.78	0.68	0.69	0.63
HI	0.63	0.68	0.69	0.59	0.72
IA	0.69	0.72	0.76	0.76	0.73
ID	0.58	0.74	0.72	0.61	0.62
IL	0.58	0.72	0.70	0.64	0.63
IN	0.61	0.63	0.70	0.65	0.67
KS	0.61	0.75	0.79	0.74	0.78
KY	0.64	0.73	0.73	0.63	0.70
LA	0.52	0.53	0.56	0.64	0.62
MA	0.60	0.62	0.74	0.69	0.66
MD	0.67	0.67	0.77	0.69	0.67
ME	0.59	0.71	0.71	0.60	0.61
MI	0.60	0.79	0.66	0.60	0.64
MN	0.73	0.81	0.79	0.76	0.72
MO	0.66	0.74	0.69	0.72	0.71
MS	0.57	0.62	0.66	0.70	0.59
MT	0.57	0.73	0.75	0.65	0.63
NC	0.58	0.71	0.73	0.68	0.67
ND	0.68	0.77	0.75	0.66	0.64
NE	0.76	0.82	0.80	0.71	0.78
NH	0.67	0.80	0.81	0.82	0.74
NJ	0.60	0.69	0.68	0.65	0.60
NM	0.55	0.63	0.68	0.62	0.56
NV	0.69	0.80	0.73	0.74	0.65
NY	0.51	0.61	0.62	0.62	0.59
OH	0.64	0.73	0.66	0.65	0.67
OK	0.72	0.68	0.54	0.65	0.64
OR	0.62	0.78	0.69	0.61	0.64
PA	0.62	0.66	0.73	0.69	0.63
RI	0.62	0.82	0.65	0.76	0.72
SC	0.48	0.67	0.72	0.59	0.60
SD	0.69	0.82	0.63	0.70	0.72
TN	0.57	0.80	0.61	0.69	0.61
TX	0.59	0.66	0.70	0.66	0.66
UT	0.67	0.80	0.76	0.66	0.69
VA	0.61	0.72	0.73	0.66	0.69
VT	0.73	0.70	0.72	0.67	0.58
WA	0.61	0.76	0.73	0.60	0.60
WI	0.64	0.79	0.77	0.71	0.69
WV	0.52	0.64	0.54	0.55	0.52
WY	0.62	0.67	0.59	0.72	0.65
10th percentile	0.53	0.62	0.61	0.60	0.58
25th percentile	0.57	0.67	0.66	0.62	0.60
50th percentile	0.61	0.71	0.70	0.66	0.64
75th percentile	0.66	0.78	0.73	0.70	0.69
90th percentile	0.69	0.80	0.77	0.74	0.72

Table 1.3 Labor force participation rates of the prime-aged

State	CPS Year				
	2011	2000	1990	1980	1977
AK	0.73	0.74	0.73	0.66	0.66
AL	0.68	0.80	0.78	0.72	0.69
AR	0.71	0.81	0.77	0.72	0.68
AZ	0.71	0.78	0.80	0.74	0.70
CA	0.70	0.77	0.77	0.75	0.71
CO	0.77	0.82	0.81	0.81	0.73
CT	0.78	0.86	0.85	0.80	0.74
DC	0.77	0.83	0.80	0.80	0.74
DE	0.77	0.83	0.81	0.71	0.73
FL	0.73	0.81	0.80	0.74	0.70
GA	0.70	0.82	0.80	0.75	0.75
HI	0.76	0.81	0.74	0.75	0.77
IA	0.81	0.90	0.86	0.78	0.74
ID	0.73	0.82	0.81	0.76	0.69
IL	0.74	0.83	0.79	0.74	0.72
IN	0.73	0.81	0.79	0.74	0.72
KS	0.79	0.83	0.81	0.80	0.74
KY	0.71	0.79	0.76	0.74	0.72
LA	0.67	0.74	0.69	0.71	0.65
MA	0.79	0.84	0.81	0.76	0.71
MD	0.80	0.88	0.85	0.77	0.73
ME	0.75	0.83	0.78	0.72	0.69
MI	0.71	0.82	0.75	0.70	0.69
MN	0.83	0.88	0.84	0.79	0.74
MO	0.76	0.85	0.80	0.76	0.72
MS	0.70	0.78	0.75	0.74	0.72
MT	0.79	0.83	0.82	0.76	0.73
NC	0.73	0.83	0.83	0.76	0.73
ND	0.86	0.87	0.80	0.77	0.69
NE	0.84	0.87	0.84	0.79	0.77
NH	0.82	0.85	0.83	0.78	0.75
NJ	0.74	0.81	0.81	0.74	0.69
NM	0.69	0.80	0.75	0.69	0.66
NV	0.73	0.81	0.80	0.79	0.74
NY	0.73	0.78	0.76	0.71	0.65
OH	0.74	0.80	0.80	0.71	0.70
OK	0.73	0.79	0.79	0.74	0.77
OR	0.76	0.85	0.79	0.73	0.66
PA	0.76	0.82	0.78	0.71	0.66
RI	0.74	0.81	0.79	0.76	0.69
SC	0.73	0.84	0.81	0.71	0.71
SD	0.84	0.91	0.84	0.78	0.71
TN	0.74	0.81	0.76	0.73	0.70
TX	0.74	0.80	0.77	0.74	0.72
UT	0.75	0.81	0.79	0.74	0.71
VA	0.77	0.85	0.81	0.74	0.73
VT	0.81	0.86	0.86	0.78	0.69
WA	0.75	0.79	0.81	0.75	0.66
WI	0.83	0.84	0.84	0.79	0.74
WV	0.66	0.76	0.70	0.63	0.63
WY	0.80	0.82	0.83	0.79	0.76
10th percentile	0.70	0.78	0.75	0.71	0.66
25th percentile	0.73	0.80	0.77	0.72	0.69
50th percentile	0.74	0.82	0.80	0.74	0.71
75th percentile	0.79	0.84	0.81	0.78	0.74
90th percentile	0.82	0.87	0.84	0.79	0.75

Table 2 Descriptive statistics

	Between states over time				Within-state over time
	Mean	Standard deviation	Minumum	Maximum	Standard deviation
Dependent variables					
All young					
Unemployment rate	0.11	0.02	0.06	0.17	0.04
Employment rate	0.67	0.04	0.56	0.76	0.05
Hour worked last week	29.83	1.86	25.71	32.85	2.54
Hourly wage	12.34	1.04	10.61	15.38	1.61
Annual income	14,673	1,391	11,321	18,112	1,965
All prime age					
Unemployment rate	0.05	0.01	0.03	0.08	0.02
Employment rate	0.78	0.03	0.67	0.83	0.04
Hour worked last week	34.39	1.48	29.93	37.71	1.46
Hourly wage	19.98	2.34	16.05	25.15	1.90
Annual income	30,969	4,237	23,888	40,188	3,736
Male young					
Unemployment rate	0.12	0.02	0.08	0.17	0.05
Employment rate	0.70	0.04	0.55	0.77	0.07
Hour worked last week	32.93	2.21	27.93	38.04	3.36
Hourly wage	13.05	1.05	11.60	16.89	2.00
Annual income	17,347	1,532	14,369	22,515	2,989
Male prime age					
Unemployment rate	0.06	0.01	0.03	0.09	0.02
Employment rate	0.85	0.03	0.74	0.90	0.03
Hour worked last week	40.41	1.68	36.67	44.11	1.52
Hourly wage	22.55	2.58	17.98	28.56	1.92
Annual income	40,670	5,427	30,837	53,457	3,691
Female young					
Unemployment rate	0.09	0.02	0.06	0.14	0.04
Employment rate	0.64	0.05	0.50	0.75	0.06
Hour worked last week	26.82	1.83	21.38	30.27	2.61
Hourly wage	11.58	1.13	9.37	14.09	2.23
Annual income	12,061	1,600	8,348	14,958	1,821
Female prime age					
Unemployment rate	0.05	0.01	0.03	0.07	0.02
Employment rate	0.70	0.04	0.57	0.77	0.06
Hour worked last week	28.58	1.66	23.54	32.70	2.56
Hourly wage	17.05	2.11	13.80	22.60	2.48
Annual income	21,600	3,519	15,494	35,027	4,803

Table 2 (cont.) Descriptive statistics

	Between states over time				Within-state over time
	Mean	Standard deviation	Minimum	Maximum	Standard deviation
Independent variables					
Employment rate of the elderly	0.57	0.05	0.41	0.67	0.06
Elderly male	0.66	0.05	0.49	0.74	0.06
Elderly female	0.49	0.05	0.34	0.58	0.08
Demographics					
Population 20-24	0.11	0.01	0.09	0.15	0.02
Population 25-54	0.59	0.03	0.54	0.70	0.03
Population 55-64	0.13	0.01	0.10	0.16	0.02
Black	0.11	0.12	0.00	0.66	0.02
High school and less	0.54	0.06	0.43	0.70	0.08
State total unemployment rate	0.06	0.01	0.03	0.09	0.02
Poor	0.13	0.03	0.07	0.22	0.02
Employment profile					
Manufacturing	0.16	0.06	0.03	0.26	0.04
Service occupation	0.44	0.05	0.38	0.67	0.07
Self-employment	0.11	0.03	0.06	0.18	0.02
Other economic indicators					
Housing price index*	205.50	48.40	135.47	364.61	102.40
GSP per capita	216,449	258,182	20,598	1,421,293	83,770
GSP growth	0.02	0.01	0.00	0.05	0.04

* Base year 1977.

Table 3.1 Regressions for labor market crowd-out: quantity (youth, both sexes)

	Unemployment		Employment		Hours worked (log)	
	(1)	(2)	(3)	(4)	(5)	(6)
Elderly employment rate	-0.105 ***	-0.021	0.208 ***	0.065 **	0.134 **	0.052
	(0.030)	(0.024)	(0.050)	(0.032)	(0.061)	(0.037)
Local average wage of young	0.017	-0.016 *	-0.057	0.009	-0.006	-0.008
	(0.018)	(0.009)	(0.036)	(0.011)	(0.023)	(0.016)
Fraction of black in state	0.003	0.092	-0.032	-0.166	0.014	-0.046
	(0.019)	(0.073)	0.035	(0.102)	(0.059)	(0.106)
Fraction of less than high school in state	0.023	-0.026	-0.050	0.028	-0.103	-0.065
	(0.046)	(0.048)	(0.074)	(0.064)	(0.087)	(0.099)
State average unemployment rate	-	-	-	-	-0.574 ***	-0.887 ***
					(0.264)	(0.160)
Fraction of poor in state	0.255 ***	0.297 ***	-0.485 ***	-0.360 ***	-0.704 ***	-0.340 **
	(0.053)	(0.062)	(0.101)	(0.106)	(0.134)	(0.152)
Percent of population 20-24	-0.126	-0.040	0.298	0.174	0.473 *	0.396 **
	(0.145)	(0.096)	(0.255)	(0.137)	(0.270)	(0.152)
Percent of jobs in manufacturing	0.002	-0.054	0.220 **	0.257 ***	0.050	0.157 *
	(0.057)	(0.063)	(0.105)	(0.079)	(0.171)	(0.092)
Percent of jobs in service industry	0.032	0.021	0.014	0.021	-0.319 **	-0.385 ***
	(0.050)	(0.057)	(0.098)	(0.081)	(0.145)	(0.110)
Percent of jobs in self-employment	-0.132	-0.117 *	0.172	-0.205 **	0.479	-0.264 *
	(0.079)	(0.063)	(0.143)	(0.096)	(0.310)	(0.154)
Housing price index growth	-0.128 ***	-0.150 ***	0.101 **	0.181 ***	0.016	0.090 **
	(0.026)	(0.023)	(0.048)	(0.030)	(0.063)	(0.035)
GSP per capita (log)	-0.003	0.005	-0.002	0.011	-0.020 ***	0.019
	(0.002)	(0.010)	(0.005)	(0.018)	(0.006)	(0.033)
GSP growth (percent)	-0.112 *	-0.054	0.081	-0.031	0.080	-0.065
	(0.064)	(0.046)	(0.084)	(0.046)	(0.084)	(0.046)
Great Recession indicator	0.050 ***	0.047 ***	-0.049 ***	-0.050 ***	-0.101 ***	-0.101 ***
	(0.007)	(0.008)	(0.009)	(0.009)	(0.015)	(0.014)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
State dummies	No	Yes	No	Yes	No	Yes
R squared	0.401	0.507	0.427	0.608	0.604	0.731
Number of observations	1683	1683	1683	1683	1683	1683

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. □

Table 3.1 (cont.) Regressions for labor market crowd-out: quantity (prime-aged, both sexes)

	Unemployment		Employment		Hours worked (log)	
	(1)	(2)	(3)	(4)	(5)	(6)
Elderly employment rate	-0.054 ***	-0.012	0.199 ***	0.044 ***	0.205 ***	0.022
	(0.014)	(0.009)	(0.023)	(0.015)	(0.031)	(0.019)
Local average wage of prime-aged	0.053 ***	0.014 *	-0.121 ***	-0.041 **	-0.095 ***	-0.013
	(0.011)	(0.008)	(0.023)	(0.017)	(0.023)	(0.014)
Fraction of black in state	-0.029 ***	-0.008	0.075 ***	0.038	0.122 ***	0.060
	(0.010)	(0.022)	(0.018)	(0.051)	(0.026)	(0.054)
Fraction of less than high school in state	0.042 *	0.032 **	-0.167 ***	-0.116 ***	-0.151 *	-0.181 ***
	(0.022)	(0.016)	(0.054)	(0.034)	(0.076)	(0.049)
State average unemployment rate	-	-	-	-	-0.524 ***	-0.576 ***
					(0.090)	(0.068)
Fraction of poor in state	0.190 ***	0.185 ***	-0.559 ***	-0.311 ***	-0.512 ***	-0.234 ***
	(0.032)	(0.032)	(0.046)	(0.052)	(0.068)	(0.059)
Percent of population 25-54	0.076 *	0.018	-0.123	-0.035	0.160 **	-0.021
	(0.040)	(0.022)	(0.099)	(0.036)	(0.069)	(0.055)
Percent of jobs in manufacturing	0.033	-0.070 ***	0.145 ***	0.127 ***	-0.019	-0.078
	(0.020)	(0.020)	(0.049)	(0.048)	(0.057)	(0.055)
Percent of jobs in service industry	0.023	-0.024	0.128 **	0.055	-0.061	-0.131 ***
	(0.018)	(0.026)	(0.058)	(0.042)	(0.068)	(0.044)
Percent of jobs in self-employment	0.000	-0.046 **	0.179 **	-0.050	0.448 ***	0.001
	(0.030)	(0.022)	(0.074)	(0.053)	(0.120)	(0.063)
Housing price index growth	-0.062 ***	-0.074 ***	-0.006	0.047 ***	-0.065 **	-0.007
	(0.009)	(0.009)	(0.020)	(0.014)	(0.030)	(0.020)
GSP per capita (log)	-0.002 *	-0.004	0.001	-0.001	-0.005	-0.013
	(0.001)	(0.005)	(0.002)	(0.011)	(0.003)	(0.013)
GSP growth (percent)	-0.052	-0.031	0.036	0.019	0.001	-0.012
	(0.032)	(0.027)	(0.042)	(0.033)	(0.024)	(0.019)
Great Recession indicator	0.034 ***	0.032 ***	-0.038 ***	-0.041 ***	-0.021 ***	-0.035 ***
	(0.003)	(0.003)	(0.005)	(0.004)	(0.006)	(0.006)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
State dummies	No	Yes	No	Yes	No	Yes
R squared	0.633	0.740	0.741	0.854	0.748	0.8664
Number of observations	1683	1683	1683	1683	1683	1683

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. □

Table 3.2 Regressions for labor market crowd-out: quantity (by gender)

	Unemployment		Employment		Hours worked (log)	
Elderly Employment Rate	Without state controls	With state controls	Without state controls	With state controls	Without state controls	With state controls
Youth male	-0.101 ***	-0.018	0.165 ***	0.061	0.127 ***	0.124 ***
	(0.034)	(0.028)	(0.058)	(0.037)	(0.043)	(0.045)
Prime-aged male	-0.055 **	-0.009	0.142 ***	0.027 ***	0.135 ***	0.031 **
	(0.012)	(0.007)	(0.020)	(0.009)	(0.020)	(0.013)
Youth female	-0.068 ***	-0.037	0.127 **	0.008	0.091 **	-0.027
	(0.021)	(0.021)	(0.043)	(0.033)	(0.064)	(0.044)
Prime-aged female	-0.020 **	-0.001	0.192 ***	0.045 **	0.236 ***	0.059 *
	(0.010)	(0.008)	(0.028)	(0.018)	(0.049)	(0.030)

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 4.1 Regressions for labor market crowd-out: price (youth, both sexes)

	Wage (log)		Total earnings (log)	
	(1)	(2)	(3)	(4)
Elderly employment rate	0.108	0.008	0.285 ***	0.123 *
	(0.079)	(0.073)	(0.097)	(0.067)
Fraction of black in state	0.054	-0.543	0.017	-0.527 *
	(0.041)	(0.332)	(0.077)	(0.300)
Fraction of less than high school in state	-0.315 ***	-0.415 ***	-0.386 **	-0.508 ***
	(0.077)	(0.147)	(0.158)	(0.154)
State average unemployment rate	0.985 *	-0.159 **	-1.651	-0.643 ***
	(0.532)	(0.151)	(0.499)	(0.235)
Fraction of poor in state	-1.024 ***	-0.514	-0.831 ***	-1.913 ***
	(0.228)	(0.239)	(0.252)	(0.295)
Percent of population 20-24	-0.292	-0.108	0.512	0.600 *
	(0.359)	(0.226)	(0.466)	(0.329)
Percent of jobs in manufacturing	-0.063	-0.261	-0.152	0.105
	(0.144)	(0.167)	(0.171)	(0.184)
Percent of jobs in service industry	0.376 ***	-0.099	-0.143	-0.630 ***
	(0.130)	(0.192)	(0.177)	(0.220)
Percent of jobs in self-employment	-0.621 ***	-0.210	-0.957 ***	-0.899 ***
	(0.158)	(0.195)	(0.281)	(0.200)
Housing price index growth	0.008	-0.162 **	0.049	0.030
	(0.070)	(0.069)	(0.103)	(0.079)
GSP per capita (log)	0.028 ***	0.223 ***	0.005	0.251 ***
	(0.005)	(0.042)	(0.007)	(0.039)
GSP growth (percent)	-0.181	-0.183	0.057	-0.161 *
	(0.126)	(0.115)	(0.128)	(0.091)
Great Recession indicator	-0.105 ***	-0.071 **	-0.162 ***	-0.146 ***
	(0.030)	(0.029)	(0.023)	(0.023)
Year dummies	Yes	Yes	Yes	Yes
State dummies	No	Yes	No	Yes
R squared	0.417	0.541	0.513	0.633
Number of observations	1683	1683	1683	1683

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. □

Table 4.1 (cont.) Regressions for labor market crowd-out: price (prime-aged, both sexes)

	Wage (log)		Total earnings (log)	
	(1)	(2)	(3)	(4)
Elderly employment rate	0.097	0.078 **	0.283 ***	0.114 ***
	(0.067)	(0.034)	(0.061)	(0.039)
Fraction of black in state	0.037	-0.385 *	0.194 ***	-0.274
	(0.051)	(0.196)	(0.051)	(0.191)
Fraction of less than high school in state	-0.422 ***	-0.601 ***	-0.635 ***	-0.918 ***
	(0.112)	(0.074)	(0.148)	(0.081)
State average unemployment rate	1.543 ***	0.354 ***	0.299	-0.462 ***
	(0.280)	(0.116)	(0.267)	(0.156)
Fraction of poor in state	-1.193 ***	-0.134	-1.632 ***	-0.471 ***
	(0.189)	(0.093)	(0.167)	(0.109)
Percent of population 25-54	0.578 **	0.263 **	0.555 ***	0.268 **
	(0.237)	(0.108)	(0.181)	(0.108)
Percent of jobs in manufacturing	-0.053	-0.299 **	0.025	-0.167
	(0.129)	(0.121)	(0.113)	(0.146)
Percent of jobs in service industry	0.637 ***	-0.001	0.560 ***	0.020
	(0.141)	(0.116)	(0.153)	(0.120)
Percent of jobs in self-employment	-0.824 ***	0.243 ***	-1.365 ***	-0.556 ***
	(0.197)	(0.091)	(0.195)	(0.110)
Housing price index growth	0.076 **	-0.084 ***	0.019	-0.056 *
	(0.041)	(0.030)	(0.052)	(0.031)
GSP per capita (log)	0.042 ***	0.196 ***	0.036 ***	0.166 ***
	(0.007)	(0.027)	(0.006)	(0.033)
GSP growth (percent)	-0.229 ***	-0.128 ***	-0.179 **	-0.067
	(0.084)	(0.043)	(0.087)	(0.052)
Great Recession indicator	-0.067 ***	-0.046 ***	-0.079 ***	-0.084 ***
	(0.017)	(0.013)	(0.014)	(0.011)
Year dummies	Yes	Yes	Yes	Yes
State dummies	No	Yes	No	Yes
R squared	0.759	0.898	0.859	0.933
Number of observations	1683	1683	1683	1683

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. □

Table 4.2 Regressions for labor market crowd-out: price (by gender)

	Wage (log)		Total earnings (log)	
Elderly Employment Rate	Without state controls	With state controls	Without state controls	With state controls
Youth male	0.107	-0.004	0.228 **	0.197 **
	(0.079)	(0.073)	(0.096)	(0.087)
Prime-age male	0.112	0.042	0.202 ***	0.064 **
	(0.058)	(0.023)	(0.060)	(0.033)
Youth female	0.083	-0.020	0.235 **	-0.028
	(0.069)	(0.067)	(0.094)	(0.075)
Prime-age female	0.093 *	0.020	0.394 ***	0.106 **
	(0.055)	(0.035)	(0.083)	(0.047)

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5.1 Test differential impact of the Great Recession (youth, both sexes)

	Unemployement		Employment		Hours worked (log)		Wage rate (log)	
		Interaction +		Interaction +		Interaction +		Interaction +
Elderly EMP rate (youth)	-0.021	-	0.062 *	-	0.043	-	-0.006	-
	(0.024)		(0.033)		(0.034)		(0.079)	
Elderly EMP rate (youth)	0.080	-	-0.055	-	0.041	-	0.278 *	-
* Great Recession indicator	(0.073)		(0.072)		(0.112)		(0.163)	
Local average wage (youth)	-0.021 **	0.059 **	0.015	-0.069 *	-0.016	0.015	-	-
	(0.009)	(0.025)	(0.013)	(0.036)	(0.018)	(0.056)		
Fraction of black in state	0.113	0.022	-0.203 *	0.042	-0.084	0.030	-0.603	-0.066
	(0.080)	(0.051)	(0.106)	(0.057)	(0.118)	(0.083)	(0.368)	(0.092)
Fraction of less than high	-0.015	0.023	0.015	0.081	-0.109	0.189	-0.455 ***	0.375
school in state	(0.051)	(0.087)	(0.061)	(0.104)	(0.093)	(0.187)	(0.145)	(0.235)
Fraction of poor in state	0.275 ***	0.239 **	-0.309 ***	-0.488 **	-0.293 *	-0.556 *	-0.144	0.259
	(0.062)	(0.105)	(0.112)	(0.192)	(0.160)	(0.298)	(0.165)	(0.419)
Percent of population	-0.036	-0.161	0.178	-0.191	0.342 **	0.566	-0.204	1.556 *
20-24	(0.100)	(0.303)	(0.138)	(0.426)	(0.159)	(0.641)	(0.238)	(0.871)
State average	-	-	-	-	-0.864 ***	0.600	-0.332	-0.351
unemployment rate					(0.155)	(0.410)	(0.224)	(0.717)
Percent of jobs in	-0.034	0.298 ***	0.261 ***	-0.306 **	0.185 *	-0.546 ***	-0.331 **	-0.519
manufacturing	(0.066)	(0.104)	(0.084)	(0.141)	(0.094)	(0.165)	(0.164)	(0.339)
Percent of jobs in service	0.011	0.041	0.041	-0.111	-0.313 ***	-0.300	-0.036	-0.088
industry	(0.055)	(0.095)	(0.077)	(0.112)	(0.106)	(0.221)	(0.189)	(0.250)
Percent of jobs in self-	-0.114	0.055	-0.205 **	0.043	-0.208	-0.412	-0.174	0.491
employment	(0.069)	(0.191)	(0.098)	(0.224)	(0.154)	(0.336)	(0.199)	(0.499)
Housing price index growth	-0.156 ***	-0.012	0.180 ***	0.022	0.070 *	0.232	-0.185 **	0.232
	(0.025)	(0.086)	(0.031)	(0.127)	(0.038)	(0.149)	(0.074)	(0.286)
GSP per capita (log)	0.009	-0.001	0.010	0.000	0.029	-0.013 *	0.225 ***	-0.001
	(0.010)	(0.003)	(0.017)	(0.004)	(0.033)	(0.007)	(0.040)	(0.008)
GSP growth (percent)	-0.055	-0.018	-0.034	0.129	-0.077	0.249	-0.172	0.004
	(0.044)	(0.144)	(0.044)	(0.190)	(0.050)	(0.185)	(0.118)	(0.621)
Great Recession indicator	-0.239 *	-	0.310 *	-	0.253	-	-0.386	-
	(0.131)		(0.164)		(0.262)		(0.307)	
Year dummies	Yes		Yes		Yes		Yes	
State dummies	Yes		Yes		Yes		Yes	

Table 5.1 (cont.) Test differential impact of the Great Recession (prime-aged, both sexes)

	Unemployement		Employment		Hours worked (log)		Wage rate (log)	
		Interaction [+]		Interaction [+]		Interaction [+]		Interaction [+]
Elderly EMP rate (prime-aged)	-0.008	-	0.037 ***	-	0.013	-	0.085 ***	-
	(0.008)		(0.013)		(0.017)		(0.032)	
Elderly EMP rate (prime) * Great Recession indicator	-0.015	-	0.032	-	0.074	-	-0.203 **	-
	(0.030)		(0.041)		(0.049)		(0.083)	
Local average wage (prime-aged)	0.023 ***	-0.025	-0.054 ***	0.021	-0.021	-0.010	-	-
	(0.008)	(0.016)	(0.019)	(0.028)	(0.016)	(0.030)		
Fraction of black in state	0.003	0.019	0.020	-0.012	0.062	-0.025	-0.379 **	-0.080
	(0.026)	(0.016)	(0.061)	(0.020)	(0.046)	(0.026)	(0.178)	(0.056)
Fraction of less than high school in state	0.038 ***	0.022	-0.119 ***	0.025	-0.178 ***	0.071	-0.577 ***	0.004
	(0.014)	(0.037)	(0.031)	(0.048)	(0.046)	(0.049)	(0.075)	(0.131)
Fraction of poor in state	0.178 ***	-0.035	-0.294 ***	-0.084	-0.226 ***	-0.168 *	-0.117	0.032
	(0.030)	(0.066)	(0.052)	(0.089)	(0.057)	(0.099)	(0.087)	(0.197)
Percent of population 25-54	-0.005	0.010	-0.003	-0.011	0.004	-0.010	0.294 ***	0.139
	(0.020)	(0.054)	(0.036)	(0.071)	(0.054)	(0.085)	(0.103)	(0.187)
State average unemployment rate	-	-	-	-	-0.549 ***	0.082	0.528 ***	-0.688 ***
					(0.073)	(0.134)	(0.117)	(0.202)
Percent of jobs in manufacturing	-0.051 **	0.166 ***	0.105 **	-0.129 ***	-0.079 *	-0.126 **	-0.377 ***	-0.003
	(0.019)	(0.036)	(0.041)	(0.044)	(0.046)	(0.057)	(0.112)	(0.135)
Percent of jobs in service industry	-0.034	0.083 **	0.060	0.011	-0.131 ***	0.167 **	-0.011	0.406 ***
	(0.023)	(0.038)	(0.040)	(0.054)	(0.043)	(0.066)	(0.118)	(0.149)
Percent of jobs in self-employment	-0.048 *	0.014	-0.057	0.178 *	0.014	-0.096	0.212 **	0.608 **
	(0.025)	(0.073)	(0.050)	(0.104)	(0.059)	(0.100)	(0.092)	(0.273)
Housing price index growth	-0.070 ***	-0.089 **	0.042 ***	0.133 ***	-0.015	0.224 ***	-0.073 **	0.144
	(0.009)	(0.035)	(0.015)	(0.045)	(0.020)	(0.067)	(0.034)	(0.102)
GSP per capita (log)	-0.005	0.002	0.002	0.000	-0.009	0.001	0.191 ***	-0.011 **
	(0.004)	(0.002)	(0.011)	(0.002)	(0.012)	(0.003)	(0.025)	(0.005)
GSP growth (percent)	-0.035	0.102	0.019	-0.004	-0.019	0.139 *	-0.131 ***	0.296 *
	(0.027)	(0.065)	(0.034)	(0.084)	(0.020)	(0.073)	(0.041)	(0.157)
Great Recession indicator	0.012	-	-0.111	-	-0.087	-	-0.055	-
	(0.079)		(0.112)		(0.111)		(0.242)	
Year dummies	Yes		Yes		Yes		Yes	
State dummies	Yes		Yes		Yes		Yes	

Table 5.2 Test differential impact of the Great Recession (by gender)

	Unemployment		Employment		Hours worked (log)		Wage (log)	
	Elderly employment rate	Interaction [+]	Elderly employment rate	Interaction [+]	Elderly employment rate	Interaction [+]	Elderly employment rate	Interaction [+]
Youth male	-0.017	0.050	0.062	-0.133	0.124 ***	-0.073	-0.021	0.470 **
	(0.029)	(0.089)	(0.038)	(0.098)	(0.044)	(0.116)	(0.077)	(0.232)
Prime-aged male	-0.006	0.009	0.020 *	0.026	0.027 **	0.005	0.039	-0.115
	(0.007)	(0.037)	(0.009)	(0.046)	(0.012)	(0.043)	(0.024)	(0.109)
Youth female	-0.047 *	0.140 *	0.002	0.082	-0.038	0.224	0.010	-0.093
	(0.023)	(0.073)	(0.034)	(0.102)	(0.043)	(0.201)	(0.073)	(0.239)
Prime-aged female	-0.001	0.017	0.047 **	-0.063	0.058 *	0.012	0.037	-0.276 ***
	(0.008)	(0.023)	(0.018)	(0.042)	(0.030)	(0.058)	(0.034)	(0.091)

Notes: [+] Interaction with the Great Recession indicator. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 6.1 Regressions for labor market crowd-out: low-educated (youth, both sexes)

	UE	EMP	Hours worked (log)	Wage (log)
Elderly EMP rate	-0.032	0.057	0.049	0.033
	(0.035)	(0.037)	(0.049)	(0.073)
Elderly EMP rate * Great Recession indicator	-0.007	0.117 *	0.290 **	-0.019
	(0.051)	(0.064)	(0.114)	(0.153)
Local average wage of young	-0.005	-0.002	-0.006	-
	(0.012)	(0.012)	(0.015)	
Fraction of black in state	0.049	-0.283 **	-0.107	-0.402 *
	(0.090)	(0.133)	(0.189)	(0.232)
Fraction of less than high school in state	-0.116 *	0.063	-0.043	-0.293
	(0.069)	(0.076)	(0.107)	(0.176)
Fraction of poor in state	0.393 ***	-0.557 ***	-0.530 ***	-0.425 *
	(0.086)	(0.106)	(0.197)	(0.220)
Percent of population 20-24	-0.090	0.322 **	0.487 **	0.009
	(0.133)	(0.159)	(0.193)	(0.376)
State average unemployment rate	-	-	-1.010 ***	-0.420
			(0.177)	(0.298)
Percent of jobs in manufacturing	-0.109	0.240 **	0.131	-0.330 *
	(0.085)	(0.101)	(0.131)	(0.170)
Percent of jobs in service industry	0.033	-0.047	-0.397 ***	-0.327
	(0.075)	(0.107)	(0.137)	(0.200)
Percent of jobs in self-employment	-0.157	0.004	-0.202	-0.314
	(0.104)	(0.152)	(0.246)	(0.271)
Housing price index growth	-0.203 ***	0.169 ***	0.099 *	-0.147 *
	(0.032)	(0.037)	(0.053)	(0.073)
GSP per capita (log)	-0.009	0.024	0.011	0.220 ***
	(0.012)	(0.023)	(0.040)	(0.040)
GSP growth (percent)	-0.060	-0.026	-0.151 ***	-0.139
	(0.051)	(0.046)	(0.045)	(0.113)
Great Recession indicator	0.049	-0.144 ***	-0.166 **	-0.055
	(0.039)	(0.043)	(0.068)	(0.088)
Year dummies	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes
R squared	0.414	0.576	0.666	0.372
Number of observations	1631	1649	1665	1665

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. All variables refer only to low-educated individuals.

Table 6.1 (cont.) Regressions for labor market crowd-out: low-educated (prime-aged, both sexes)

	UE	EMP	Hours worked (log)	Wage (log)
Elderly EMP rate	-0.016	0.022	0.006	-0.015
	(0.013)	(0.018)	(0.024)	(0.037)
Elderly EMP rate * Great Recession indicator	-0.037	0.076 **	0.113 **	0.046
	(0.024)	(0.030)	(0.047)	(0.079)
Local average wage of prime-aged	-0.002	-0.010	-0.011	-
	(0.008)	(0.012)	(0.016)	
Fraction of black in state	-0.055	0.114	0.276 *	-0.191
	(0.065)	(0.146)	(0.143)	(0.137)
Fraction of less than high school in state	-0.058 **	0.051	-0.036	-0.341 ***
	(0.025)	(0.040)	(0.061)	(0.100)
Fraction of poor in state	0.224 ***	-0.393 ***	-0.360 ***	-0.373 ***
	(0.044)	(0.080)	(0.089)	(0.105)
Percent of population 25-54	0.009	-0.028	0.008	0.097
	(0.030)	(0.044)	(0.075)	(0.111)
State average unemployment rate	-	-	-0.778 ***	0.198
			(0.096)	(0.162)
Percent of jobs in manufacturing	-0.099 ***	0.179 ***	-0.027	-0.324 **
	(0.031)	(0.055)	(0.075)	(0.126)
Percent of jobs in service industry	-0.055	0.048	-0.151 **	-0.134
	(0.037)	(0.077)	(0.067)	(0.088)
Percent of jobs in self-employment	-0.031	0.008	0.088	0.073
	(0.036)	(0.061)	(0.075)	(0.133)
Housing price index growth	-0.105 ***	0.083 ***	0.002	-0.063
	(0.012)	(0.016)	(0.024)	(0.041)
GSP per capita (log)	-0.008	-0.001	-0.010	0.169 ***
	(0.005)	(0.013)	(0.016)	(0.023)
GSP growth (percent)	-0.046	0.011	-0.019	-0.154 ***
	(0.033)	(0.046)	(0.030)	(0.055)
Great Recession indicator	0.077 ***	-0.111 ***	-0.078 **	-0.074
	(0.014)	(0.021)	(0.030)	(0.047)
Year dummies	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes
R squared	0.688	0.794	0.827	0.705
Number of observations	1631	1651	1665	1665

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. All variables refer only to low-educated individuals.

Table 6.2 Regressions for labor market crowd-out: high-educated (youth, both sexes)

	UE	EMP	Hours worked (log)	Wage (log)
Elderly EMP rate	0.011	0.013	0.002	0.028
	(0.016)	(0.026)	(0.031)	(0.051)
Elderly EMP rate * Great Recession indicator	0.032	0.008	0.105	0.500 ***
	(0.065)	(0.071)	(0.138)	(0.144)
Local average wage of young	-0.019 **	0.017	-0.013	-
	(0.008)	(0.013)	(0.018)	
Fraction of black in state	0.030	-0.014	0.112	-0.539 *
	(0.041)	(0.119)	(0.166)	(0.313)
Fraction of less than high school in state	-0.034	0.029	-0.215 *	-0.256
	(0.051)	(0.093)	(0.121)	(0.163)
Fraction of poor in state	0.145 **	-0.302 *	-0.206	-0.075
	(0.057)	(0.151)	(0.192)	(0.187)
Percent of population 20-24	-	-	-	-
State average unemployment rate	-	-	-0.732 ***	-0.623 **
			(0.191)	(0.258)
Percent of jobs in manufacturing	-0.055	0.225 **	0.146	-0.198
	(0.051)	(0.096)	(0.114)	(0.212)
Percent of jobs in service industry	-0.022	0.039	-0.369 ***	-0.025
	(0.070)	(0.114)	(0.134)	(0.227)
Percent of jobs in self-employment	-0.020	-0.378 ***	-0.369 **	-0.229
	(0.062)	(0.114)	(0.141)	(0.232)
Housing price index growth	-0.048 **	0.154 ***	0.104 **	-0.145 *
	(0.019)	(0.039)	(0.043)	(0.082)
GSP per capita (log)	0.006	0.014	0.037	0.227 ***
	(0.011)	(0.016)	(0.026)	(0.042)
GSP growth (percent)	-0.061	-0.044	-0.031	-0.225 *
	(0.051)	(0.064)	(0.063)	(0.130)
Great Recession indicator	0.005	-0.019	-0.196 *	-0.456 ***
	(0.047)	(0.052)	(0.116)	(0.120)
Year dummies	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes
R squared	0.246	0.395	0.573	0.464
Number of observations	1549	1648	1665	1665

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. All variables refer only to high-educated individuals.

Table 6.2 (cont.) Regressions for labor market crowd-out: high-educated (prime-aged, both sexes)

	UE	EMP	Hours worked (log)	Wage (log)
Elderly EMP rate	0.000	0.007	0.008	0.072 **
	(0.006)	(0.011)	(0.017)	(0.028)
Elderly EMP rate * Great Recession indicator	-0.039 **	0.160 ***	0.195 ***	0.182 **
	(0.018)	(0.041)	(0.048)	(0.088)
Local average wage of prime-aged	-0.008	0.001	-0.015	-
	(0.005)	(0.015)	(0.016)	
Fraction of black in state	0.000	0.041	0.008	-0.312 *
	(0.016)	(0.051)	(0.074)	(0.157)
Fraction of less than high school in state	0.007	0.003	-0.073	-0.260 ***
	(0.014)	(0.038)	(0.047)	(0.080)
Fraction of poor in state	0.090 ***	-0.159 ***	-0.114 **	0.006
	(0.022)	(0.045)	(0.054)	(0.105)
Percent of population 25-54	0.027	-0.049	-0.076	0.291 **
	(0.023)	(0.049)	(0.063)	(0.129)
State average unemployment rate	-	-	-0.273 ***	0.224
			(0.068)	(0.140)
Percent of jobs in manufacturing	-0.063 ***	0.156 ***	-0.017	-0.185
	(0.017)	(0.056)	(0.066)	(0.136)
Percent of jobs in service industry	-0.006	0.046	-0.113 *	0.077
	(0.019)	(0.041)	(0.058)	(0.131)
Percent of jobs in self-employment	-0.022	-0.087	-0.071	0.282 **
	(0.021)	(0.066)	(0.077)	(0.117)
Housing price index growth	-0.042 ***	0.020	-0.009	-0.101 **
	(0.008)	(0.018)	(0.023)	(0.039)
GSP per capita (log)	-0.002	0.004	0.006	0.186 ***
	(0.004)	(0.012)	(0.018)	(0.031)
GSP growth (percent)	-0.033 **	0.019	-0.028	-0.097 *
	(0.014)	(0.027)	(0.023)	(0.051)
Great Recession indicator	0.044 ***	-0.118 ***	-0.116 ***	-0.113
	(0.015)	(0.026)	(0.036)	(0.082)
Year dummies	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes
R squared	0.556	0.639	0.661	0.873
Number of observations	1631	1649	1665	1665

Note: * significant at 10%, ** significant at 5%, *** significant at 1%. All variables refer only to high-educated individuals.

Table 7 Sensitivity checks

	Youth, both sexes				prime-aged, both sexes			
Elderly employment rate	Unemployment	Employment	Hours worked (log)	Wage (log)	Unemployment	Employment	Hours worked (log)	Wage (log)
State-fixed effects	-0.021	0.065 **	0.052	0.008	-0.012	0.044 ***	0.022	0.078 **
	(0.024)	(0.032)	(0.037)	(0.073)	(0.008)	(0.015)	(0.019)	(0.034)
3-year lag (state-fixed effects)	-0.016	0.032	0.016	0.153 **	-0.020 **	0.031 *	0.021	0.065 *
	(0.020)	(0.034)	(0.048)	(0.071)	(0.008)	(0.018)	(0.017)	(0.037)
GLS (state-fixed effects)	-0.021	0.089 ***	0.067 **	0.038	-0.018 **	0.045 ***	0.016	0.039
	(0.020)	(0.027)	(0.033)	(0.053)	(0.007)	(0.011)	(0.013)	(0.027)
Pooled three years (state-fixed effects)	-0.056	0.222 ***	0.102	0.027	-0.013	0.108 ***	0.047	0.068
	(0.044)	(0.054)	(0.066)	(0.122)	(0.016)	(0.025)	(0.036)	(0.043)

	Youth male				prime-aged male			
Elderly LFP	Unemployment	Employment	Hours worked (log)	Wage (log)	Unemployment	Employment	Hours worked (log)	Wage (log)
State-fixed effects	-0.008	0.055	0.139 ***	-0.012	-0.012	0.024 ***	0.034 **	0.038
	(0.030)	(0.035)	(0.050)	(0.070)	(0.008)	(0.009)	(0.014)	(0.025)
3-year lag (state-fixed effects)	0.015	-0.004	0.014	0.105 *	-0.015 *	0.018	0.016	0.073 **
	(0.026)	(0.033)	(0.048)	(0.060)	(0.008)	(0.012)	(0.014)	(0.028)
GLS (state-fixed effects)	-0.002	0.083 ***	0.079 **	-0.038	-0.010	0.020	0.022 **	0.023
	(0.022)	(0.028)	(0.033)	(0.051)	(0.007)	(0.009)	(0.010)	(0.024)
Pooled three years (state-fixed effects)	-0.057	0.133 **	0.188 ***	-0.001	0.000	0.053 **	0.037	0.100 **
	(0.047)	(0.063)	(0.068)	(0.114)	(0.016)	(0.020)	(0.025)	(0.004)

	Youth female				prime-aged female			
Elderly LFP	Unemployment	Employment	Hours worked (log)	Wage (log)	Unemployment	Employment	Hours worked (log)	Wage (log)
State-fixed effects	-0.031	0.002	-0.030	-0.030	0.001	0.045 **	0.056 *	0.014
	(0.020)	(0.034)	(0.045)	(0.070)	(0.009)	(0.051)	(0.031)	(0.035)
3-year lag (state-fixed effects)	-0.044 *	0.039 **	-0.006	0.007	-0.017 **	0.055 **	0.091 ***	0.000
	(0.019)	(0.030)	(0.035)	(0.067)	(0.007)	(0.015)	(0.027)	(0.032)
GLS (state-fixed effects)	-0.046 **	0.013	0.001	-0.003	-0.005	0.054 ***	0.043 **	0.014
	(0.018)	(0.027)	(0.036)	(0.053)	(0.006)	(0.012)	(0.017)	(0.025)
Pooled three years (state-fixed effects)	-0.054	0.153 ***	0.048	-0.055	-0.006	0.124 ***	0.144 **	-0.014
	(0.040)	(0.052)	(0.081)	(0.109)	(0.012)	(0.032)	(0.056)	(0.051)

Table 8.1 TSLS estimates

Panel A:	Youth, both sexes				prime-aged, both sexes			
Outcome variable	OLS	IV	First stage	F-statistic	OLS	IV	First stage	F-statistic
Unemployment	-0.008	0.085	-0.085 ***	16.76	-0.006	-0.023	-0.108 ***	23.37
	(0.026)	(0.199)	(0.021)		(0.009)	(0.058)	(0.022)	
Employment	0.063 *	-0.181	-0.085 ***	16.76	0.036 ***	0.378 ***	-0.108 ***	23.37
	(0.032)	(0.281)	(0.021)		(0.013)	(0.116)	(0.022)	
Hours worked	0.056	-0.328	-0.086 ***	17.45	0.011	0.302 **	-0.107 ***	23.28
	(0.038)	(0.355)	(0.021)		(0.017)	(0.126)	(0.022)	
Wage rate	-0.031	0.822	-0.086 ***	17.28	0.083 ***	0.245	-0.109 ***	23.85
	(0.074)	(0.605)	(0.021)		(0.030)	(0.240)	(0.022)	

Panel B:	Youth male				prime-aged male			
Outcome variable	OLS	IV	First stage	F-statistic	OLS	IV	First stage	F-statistic
Unemployment	-0.009	-0.277	-0.084 ***	8.78	-0.005	-0.079	-0.131 ***	18.33
	(0.026)	(0.299)	(0.028)		(0.008)	(0.065)	(0.031)	
Employment	0.064	-0.281	-0.098 ***	11.94	0.018 *	0.344 ***	-0.126 ***	17.25
	(0.041)	(0.329)	(0.028)		(0.009)	(0.120)	(0.030)	
Hours worked	0.134 **	-0.862 *	-0.096 ***	11.80	0.027 *	-0.030	-0.123 ***	16.42
	(0.051)	(0.488)	(0.028)		(0.014)	(0.111)	(0.030)	
Wage rate	-0.029	0.887	-0.096 ***	11.68	0.048 *	0.231	-0.124 ***	16.72
	(0.068)	(0.705)	(0.028)		(0.025)	(0.253)	(0.030)	

Panel C:	Youth female				prime-aged female			
Outcome variable	OLS	IV	First stage	F-statistic	OLS	IV	First stage	F-statistic
Unemployment	-0.045 **	0.351	-0.051 *	3.43	-0.002	0.017	-0.081 ***	7.33
	(0.022)	(0.438)	(0.028)		(0.009)	(0.086)	(0.030)	
Employment	0.006	-0.389	-0.051 *	3.45	0.048 **	0.530 *	-0.067 **	5.09
	(0.034)	(0.620)	(0.027)		(0.018)	(0.300)	(0.030)	
Hours worked	-0.025	-0.247	-0.050 *	3.34	0.056 *	1.210 **	-0.066 **	5.06
	(0.046)	(0.838)	(0.027)		(0.029)	(0.590)	(0.030)	
Wage rate	-0.038	-0.114	-0.050 *	3.35	0.019	0.194	-0.067 **	5.10
	(0.068)	(1.300)	(0.027)		(0.028)	(0.502)	(0.029)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Appendix Table 1. Regressions for labor market crowd-out: quantity (with vs without wage control)

	Unemployment (with wage control)	Unemployment (without wage control)	Employment (with wage control)	Employment (without wage control)
Youth, both sexes	-0.021	-0.021	0.065 **	0.065 **
	(0.024)	(0.024)	(0.032)	(0.032)
prime-aged, both sexes	-0.01191	-0.011	0.044 ***	0.041 ***
	(0.009)	(0.009)	(0.015)	(0.015)
Youth, male	-0.018	-0.018	0.061	0.061
	(0.028)	(0.028)	(0.037)	(0.037)
prime-aged, male	-0.012	-0.009	0.027 ***	0.027 ***
	(0.007)	(0.007)	(0.009)	(0.009)
Youth, female	-0.037	-0.037 *	0.008	0.008
	(0.021)	(0.021)	(0.033)	(0.033)
Prime-aged, female	-0.001	-0.001	0.045 **	0.045 **
	(0.008)	(0.008)	(0.018)	(0.018)

Appendix Table 2. Reduced-form estimation of elderly mortality on young/prime-age labor supply

Elderly Mortality	Unemployment	Employment
Youth	-0.008	0.021
	(0.021)	(0.036)
Prime-aged	0.034	-0.074
	(0.051)	(0.055)

RECENT WORKING PAPERS FROM THE CENTER FOR RETIREMENT RESEARCH AT BOSTON COLLEGE

Growth in Health Consumption and Its Implications for Financing OASDI: An International Perspective
Barry P. Bosworth and Gary Burtless, September 2012

Using Participant Data to Improve 401(k) Asset Allocation
Zhenyu Li and Anthony Webb, September 2012

Job Demand and Early Retirement
Sepideh Modrek and Mark R. Cullen, August 2012

Changes in Labor Force Participation of Older Americans and Their Pension Structures: A Policy Perspective
Frank W. Heiland and Zhe Li, July 2012

How Would GASB Proposals Affect State and Local Pension Reporting?
Alicia H. Munnell, Jean-Pierre Aubry, Joshua Hurwitz and Laura Quinby, June 2012

Borrow Less Tomorrow: Behavioral Approaches to Debt Reduction
Dean Karlan and Jonathan Zinman, May 2012

Spousal Labor Market Effects from Government Health Insurance: Evidence from A Veterans Affairs Expansion
Melissa A. Boyle and Joanna N. Lahey, April 2012

Measuring Social Security Proposals by More than Solvency: Impacts on Poverty, Progressivity, Horizontal Equity, and Work Incentives
Melissa M. Favreault and C. Eugene Steuerle, April 2012

How Important Is Asset Allocation to Financial Security in Retirement?
Alicia H. Munnell, Natalia Sergeyevna Orlova, and Anthony Webb, April 2012

Great Recession-Induced Early Claimers: Who Are They? How Much Do They Lose?
Matthew S. Rutledge and Norma B. Coe, April 2012

Effects of Employer Health Costs on the Trend and Distribution of Social Security-Taxable Wages
Gary Burtless And Sveta Milusheva, April 2012

All working papers are available on the Center for Retirement Research website (http://crr.bc.edu) and can be requested by e-mail (crr@bc.edu) or phone (617-552-1762).