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ARE AGING BABY BOOMERS SQUEEZING YOUNG WORKERS OUT OF JOBS?

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Introduction

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. But some suggest that more work by older persons reduces the job opportunities for younger persons.

This contention, known as the "lump of labor" theory, is widely accepted in many European countries and has provided an economic rationale for early retirement programs. However, economists in the United States generally reject this theory, arguing that the labor market is dynamic and the economy can adapt to labor force changes. Nevertheless, "crowding out" has received increased media attention in the wake of the Great Recession and, if generally accepted, could impede the trend towards working longer.[1] This *brief* investigates whether any empirical support exists for the lump of labor theory.

The report proceeds as follows. The first section introduces the lump of labor theory and summarizes the existing evidence. The second section describes the data and basic methodology used in the analysis. The third section presents the baseline results, followed by the results of numerous tests of the strength of the findings. The fourth section describes the results of a separate test for the Great Recession. The fifth section identifies the causal relationship between the labor force activity of the old and the young. The final section concludes that there is no evidence that increasing the employment of older persons reduces the job opportunities or wage rates of younger persons.

The "Lump of Labor" Theory

The notion that younger and older workers are engaged in a zero-sum game for a fixed number of jobs – the "lump of labor" theory – can be traced to Henry Mayhew's 1851 *London Labour and the London Poor*.[2] Mayhew argued that cutting the number of hours employees worked would reduce unemployment. Opponents of free trade, technological advance, and immigration often use the lump of labor argument to make people fearful about losing their jobs.

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Lump-of-labor advocates 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 because immigrants enter the market as consumers as well as workers. Thus it is not surprising that researchers have found little evidence of crowding out in the areas of trade, technology, or immigration.[3]

The literature on the relationship between the labor force participation of younger and older individuals is limited. A series of papers examined whether employment of older individuals crowds out employment of younger individuals in 12 countries, including the United States.[4] 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.[5]

Skeptics could argue that the international study did not fully investigate the issue. The authors were constrained to methods and data that could be applied to all 12 countries for ease of comparison. Further, they measured the impact of older workers' labor force participation only on *employment* of younger workers, ignoring any potential impact on their hours worked or wages. Moreover, the period they examined was before the Great Recession and, whatever the likelihood of crowding out in a growing economy, the dynamics might be very different in a stagnant one.

Data and Methodology

This study uses data from the nation's largest annual labor market survey, the *Current Population Survey* (CPS), which includes detailed questions about labor force participation, wages and salaries, and income from various sources. The survey also includes rich demographic information, as well as data on the individual's health and work disability status. The analysis exploits the variation across states in the labor force activity of both old and young for the period 1977-2011.[6]

The sample, which consists of state averages for individuals age 20-64 in the survey year, is divided into three age groups: 20-24 (the "young"), 25-54 (the "prime-aged"), and 55-64 (the "old"). The variables of interest include labor force participation, employment and unemployment, hours worked, and wage rates.[7]

The basic model used to examine the relationship of the labor force activity of the old to that of the young is of the form:

$$Y_{st} = ß_0 + ß_1 Olderemp_{st} + X_{st}ß_2 + \gamma_t + \delta Rec + \varepsilon_{st}$$

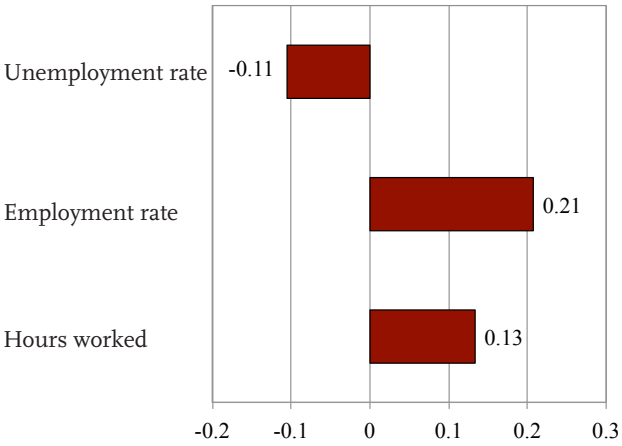
The dependent variable, Y_{st}, is the labor market measure of interest, such as the youth unemployment rate, in each state and each year. The key independent variable is the state-year employment rate of the older persons ($Olderemp_{st}$). The vector X_{st} includes a set of state-specific, explanatory variables, including differences in labor market conditions.[8] γ_t is a set of indicator variables for the years 1977-2011 to control for nationwide economic changes in any given year. Additionally, the equation includes a variable for the Great Recession, *Rec*, to capture the impact of the economic downturn on labor supply.[9]

Baseline Results

Figure 1 (on the next page) displays the regression results of the baseline equation for men and women combined. The equation was run separately with three different dependent variables to capture various measures of youth labor force activity: the unemployment rate, the employment rate, and the number of hours worked per week. If crowding out were occurring, an increase in the employment of older persons would increase youth unemployment, decrease employment, and reduce hours worked. However, the coefficients all show the opposite effects. A 1-percentage-point increase in the older worker employment rate is associated with a decline in youth unemployment of 0.11 percentage points, an increase in youth employment of 0.21 percentage points, and an increase in hours worked per week of 0.13 percentage points.[10]

The question is how robust are these results? Would slicing and dicing the data in different ways produce different answers?

Figure 1. Impact of Older Worker Employment Rate on Youth Labor Market Activity, 1977-2011



Note: All coefficients are statistically significant at least at the 5-percent level.
Source: Authors' calculations using U.S. Census Bureau, *Current Population Survey*, 1977-2011.

What About Using a Different Age Group?

Perhaps younger workers are too narrow of a demographic group for a crowd-out effect to appear. What about prime-aged workers (those aged 25-54)? The result is the same as for the young: employment of the old 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. Again, no evidence of crowding out.

What About Better Controlling for Differences Among States?

The strong positive relationship between the employment of the old and the outcomes for the young are surprising and counter-intuitive. One possibility is that the variables included in the equation do not fully account for the differences among states. That is, employment of young workers and older workers could be positively related because California has a strong economy and both groups are doing well, while Nevada has a poor economy and both groups are doing poorly.

One approach to solving this problem is to introduce state controls, which isolates the effects of changing economic conditions on labor force participation from the largely structural influences that vary across states. This approach is referred to as a "fixed-effects" model.[11]

The results of the fixed-effects model are consistent with those from the baseline regressions. Within-state increases in employment of the old continue to have a negative impact on unemployment of youth and a positive impact on their employment and hours worked. However, the magnitude of the coefficients is reduced and only one of the three coefficients is statistically significant. Thus, when controls are introduced for the state specific characteristics, with an exception for employment, older worker employment has no impact on unemployment and hours worked for both the young and prime-aged. That is, the results show no evidence of crowding out.[12]

Do the Results Differ by Gender?

So far, the results have covered both men and women combined. However, over the last several decades, female labor supply has increased, so perhaps the results for men and women will vary. Using the state fixed-effects equation, the analysis estimated separate equations for men and women. The results are largely consistent with the aggregate analysis. The magnitudes of the coefficients on employment of the old are sometimes higher and sometimes lower, and significance fails in some cases. However, for both males and females, the results show no evidence of a crowd-out effect. Once again, employment of the old is positively associated with employment of the young and the prime-aged.

If Not Employment, How About Wages?

Maybe the employment of older workers does not affect the "quantity" of young workers employed, unemployed, or their hours worked, but it could have an impact on the "price" of young labor. To test this hypothesis, two measures of "price" are used: hourly wage and annual income. The explanatory variables are the same as in the earlier equations. 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. The message is clear: no evidence supports the contention that the employment of the old reduces the wages of the young.

What About Level of Education?

Economic theory suggests that the more similar the groups are with respect to skills, the greater the degree of possible substitution. So, perhaps the crowd-out effect would show up among groups of workers with similar education levels. To test this proposition, the analysis considered the effects separately for those with high-school-and-less and college-and-above. Again, the results provide no support for the crowd-out hypothesis. The relationship between older and younger persons' labor force behavior does not vary by educational attainment.

Results for the Great Recession

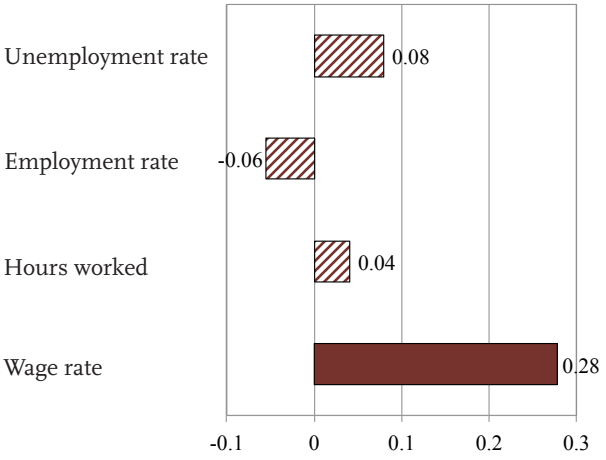
The Great Recession is generally acknowledged to be the worst economic crisis since the Great Depression, resulting in a dramatic increase in unemployment. While a fundamental flaw underlying the lump-of-labor theory is that it ignores long-run labor market adjustments, short-run effects could differ from long-run effects. That is, when employment overall is dropping, crowd-out between different groups might be possible. To test this hypothesis, the equation was modified so that all of the state-specific explanatory variables (the X_{st} term in the equation) are interacted with the Great Recession indicator (*Rec*) to allow for a differential impact of the Great Recession on labor market behaviors:

$$Y_{st} = ß_0 + ß_1 Olderemp_{st} + ß_3 Olderemp_{st} Rec + \delta Rec + X_{st} ß_4 + ß_5 X_{st} Rec + \gamma_t + U_s + \varepsilon_{st}$$

The results are shown in Figure 2. If older worker employment were affecting the labor force activity of the young during the Great Recession, the coefficient of the interaction term should be positive and statistically significant. Instead, it is insignificant using youth unemployment rates, employment rates, and hours worked. The only relationship that changes during the Great Recession is that an increase in the older worker employment rate is associated with an increased hourly wage rate of the young by an additional 0.28 percent compared to the typical business cycle. This finding, however, contradicts the crowd-out effect. Similar patterns emerge for the prime-aged.

The results by gender are slightly mixed.[13] For males, the estimates provide no evidence of any crowding out during the Great Recession. Instead, employment of older males has an even more positive impact on the various labor market outcomes of younger males than in a typical business cycle. 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.

Figure 2. Impact of Older Worker Employment Rate with Interaction Term for Great Recession on Youth Labor Market Activity, 1977-2011



Note: Striped bars indicate that coefficients are not statistically significant. The solid bar indicates that the coefficient is statistically significant at the 10-percent level.
Source: Authors' calculations using 1977-2011 CPS.

What Causes What?

Even when controlling for the various determinants of general unemployment, the analysis described above cannot establish a causal relationship between older workers' employment and the labor force activity of younger workers. For instance, a positive technology or investment shock in a state may simultaneously boost employment of both older and younger workers. One way to address this problem and to obtain unbiased estimates is an instrumental variable approach.

The goal is to identify an instrumental variable that 1) is correlated with the employment of older workers; and 2) has no direct impact on the employment of the younger cohort. State-year-age specific mortality rates from the Centers for Disease Control

and Prevention satisfy both criteria.[14] On the one hand, the association between individuals' employment behavior and health status is well-established. On the other hand, no evidence suggests that the mortality of the old is related to the labor force experience of the young.[15]

Once the instrument is constructed, the next step is to estimate a Two Stage Least Squares model. The first stage estimates the effect of state-year mortality rates on the employment rate of the old, *Olderemp*.[16]

$$Olderemp_{st} = a_0 + a_1 MT_{st} + X_{st}ß_2 + \gamma_t + U_s + \varepsilon_{st}$$

The second stage substitutes the predicted value of older worker employment from the first stage for actual older worker employment.

$$Y_{st} = ß_0 + ß_1 \widehat{Olderemp}_{st} + X_{st}ß_2 + \gamma_t + U_s + \varepsilon_{st}$$

Where $\widehat{Olderemp}_{st}$ is the predicted employment rate of the old.

Correcting for the possibility that an endogenous factor could be affecting the employment of both the old and the young does not change the results at all: none of the coefficients are statistically significant. The message is clear and consistent with the earlier equations: changes in employment rates of older workers do not adversely affect the employment rate of the young.

Conclusion

This horse has been beaten to death. An exhaustive search found no evidence to support the lump of labor theory in the United States. 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. 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 rates of their younger counterparts. If anything, the opposite is true. Finally, the effects of older worker 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 state 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, the lump-of-labor theory needs to be put to rest. The theory may sound plausible, but the data do not support it.

Endnotes

1 This claim has appeared in *Reuters, The New York Times, U.S. News & World Report, Time, Bloomberg, CNN Money, Insurance Journal*, and other major media. See Mutikani (2010); Greenhouse (2009); Brandon (2009); Valetkevitch (2010); Dickler (2010); Cinko, McDonough, and Schlisserman (2010); and Gandel (2010) for a few examples.

2 Mayhew (1864).

3 The empirical literature on how wages adjust 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 2006; Mishra 2007), while other studies claim the impact is negligible (Card 2005; Ottaviano and Peri 2008).

4 Gruber and Wise (2010).

5 One possible explanation for this positive relationship is suggested by Van Dalen and Henkens (2002), who focus 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 old would be positively related.

6 The March CPS does not include state identifiers before 1977. Data for employment status are missing from 1994.

7 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 that is working. The unemployment rate represents the number unemployed as a percent of the labor force.

8 Examples of the specific variables included are: labor market conditions (per-capita Gross State Product (GSP), GSP growth, the state average unemployment rate, the state poverty rate, and the age structure of the population); nature of employment (the concentration of manufacturing, the concentration of the service industry, and the share of self-employment); and demographic characteristics (the share of low educated and race composition).

9 For a more detailed description of the methodology and results, see the full-length paper – Munnell and Wu (2012) – from which this report is derived.

10 Most of the other controls have coefficients in the expected direction, albeit often insignificant. In terms of significant effects, the state poverty level increases state-level youth unemployment, and high housing prices and rapid GSP growth reduce it. Further, youth unemployment increases significantly during the Great Recession.

11 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.

12 The robustness of the state-fixed effects findings were tested 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 young and prime-aged 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 weights in the analysis, which could produce inefficient estimates of coefficients, the equations are re-estimated using a feasible Generalized Least Squares (GLS) procedure which re-weights the state observations. 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. None of the results support the crowd-out hypothesis.

13 For selected coefficient estimates, see Munnell and Wu (2012).

14 For instance, involuntary retirements are often due to a negative health shock (Haider and Stephens 2007; Smith 2006; and Hurd and Rohwedder 2003, 2008), and poor health status among older workers is strongly correlated with early exit from the labor market (McGarry 2004).

15 Stevens et al. (2011) provide evidence on the independence of older mortality rates and the work status of younger workers.

16 As opposed to using the mortality rates of all individuals age 55-64, we use the mortality rates of males age 55-64 for larger variation across states 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.

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