Young and Out of Work: An Analysis of Teenage Summer Employment, 1972–2012

J. Wilson Mixon Jr. and E. Frank Stephenson

For many teenagers, a summer job was a rite of passage. Beyond the earnings gained from summer employment, evidence suggests that summer work may have additional benefits, such as reducing participation in criminal activity (Heller 2014); reducing behavior such as drug or alcohol use, fighting, and damaging others' property (Sum, Trubskyy, and McHugh 2013); and improving subsequent academic achievement (Leos-Urbel 2014). Moreover, positive relationships found between youth employment and future labor market success (Ruhm 1995) and negative relationships reported between youth unemployment and earnings up to 10 years later (Mroz and Savage 2006), though not focused specifically on summer employment, suggest that teenage labor market outcomes affect the future.

Over the past four decades, however, the percentage of teens with summer jobs has fallen. Figure 1 plots the July employment-population ratio for white male, black male, white female, and black female 16 to 19-year-olds over the period 1972–2012. We use employment in July as the measure of summer jobs because school-year timing varies. In many areas, school years run from September through June, while in others the school year runs from August through May. Hence, July is the only month that should not have

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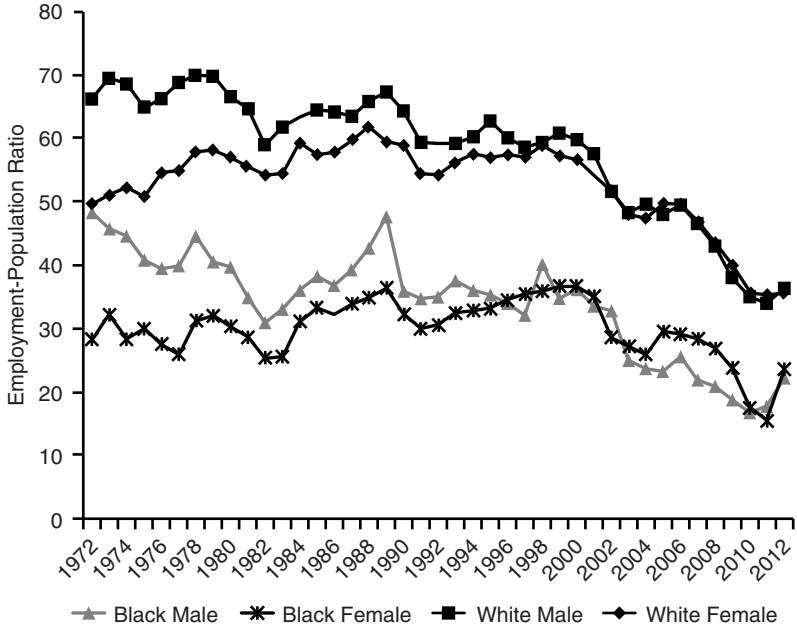
J. Wilson Mixon Jr. is Dana Professor of Economics Emeritus and E. Frank Stephenson is Professor of Economics at Berry College.

FIGURE 1
Employment-Population Ratio for 16 to 19-Year-Olds in July 1972–2012



Source: Bureau of Labor Statistics.

substantial overlap with school calendars. These data from the Bureau of Labor Statistics (BLS) include all years for which the BLS separately reports all four demographic subgroups. We consider the four groups separately rather than the aggregate teen employment-population ratio to allow for different behavior across demographic segments of the population. For example, Vedder and Gallaway (1993) document the divergent behavior of white and nonwhite unemployment from 1940 to 1990.

For both males and females, the employment-population ratio of whites is about 20 percentage points greater than for blacks. Both black males and white males exhibit downward trends in employment of approximately 0.6 to 0.8 percentage points per year. The employment-population rates for females tend to increase gradually until about 2000 before receding during the last decade. The net result is converging male and female employment-population ratios (conditional on race), though a large gap persists between blacks and

whites. Not surprisingly, temporary dips in the employment rates following recessions in the early 1980s and early 1990s suggest teen employment is sensitive to cyclical macroeconomic conditions. However, any cyclical component seems overwhelmed by the more or less continuous decline in all series since 2000; a decrease following the recession of 2001 might have been expected but the decline continued for a decade until a slight uptick in 2011–12.

The downward trend in teen summer employment has provoked news headlines such as "Teen Job-Seekers Face Summer Bummer" (Robinson 2008) and "Toughest Summer Job This Year Is Finding One" (Goodman 2008), but, to our knowledge, the trend has not yet received scholarly attention. Hence, we examine reasons for the decline in teenagers' summer employment between 1972 and 2012. Vedder and Galloway (1993) argue that government labor policies often harm their intended beneficiaries, so we pay particular attention to the minimum wage as a possible contributor to the decline in youth summer employment.

Empirical Framework

Youth employment has been most extensively studied in the context of the minimum wage. Our empirical approach, based on previous research, uses a reduced-form model similar to that used in the minimum wage study of Neumark and Wascher (2004):[1]

$$EPR_t = \beta_0 + \beta_1 RealMinWage_t + \beta_2 Manufacturing\ Employment_t + \beta_3 UnemploymentRate_t + \beta_4 OlderWorkers_t + \beta_5 CollegeEnrollment_t + \beta_6 EPR_{-1t} + \varepsilon_t,$$

where EPR is the U.S. employment-population ratio in July for each of the four demographic groups (white males, black males, white females, and black females). Separate consideration of the four demographic groups rather than aggregate teen employment allows not only for the different behavior over time for the various groups,

[1]Although not specifically focused on summer jobs, the relationship between the minimum wage and teen employment has been extensively researched. Studies such as Adie (1973); Brown, Gilroy, and Kohen (1982); Partridge and Partridge (1998); and Neumark and Wascher (2004) find that higher minimum wage levels are associated with less teenage employment or more teenage unemployment. Meer and West (2013) find that the minimum wage reduces job growth, particularly for younger workers. One channel for the minimum wage's effect on teenage employment is its effect on low-wage industries (Uri and Mixon 1978).

TABLE 1
Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Real Minimum Wage	$7.53	$0.90	$6.30	$9.33
Black Female 16–19	30.01	4.72	15.6	36.7
White Female 16–19	52.97	6.79	35.4	61.9
Black Male 16–19	34.13	8.35	16.8	48.4
White Male 16–19	58.25	10.07	34.1	70.0
Black Female Over 65	9.41	1.84	5.6	14.2
White Female Over 65	8.81	1.88	6.9	13.0
Black Male Over 65	15.19	3.41	9.9	23.9
White Male Over 65	18.27	2.29	15.1	24.0
Black Female College	27.89	7.85	13.5	41.9
White Female College	35.56	8.58	21.8	47.7
Black Male College	24.23	4.97	17.5	35.2
White Male College	34.86	4.58	27.1	42.4
White Male 25–54 UR	4.13	1.52	1.9	8.1
Manufacturing Employment	15.82	4.70	8.9	24.2
Teen Birthrate	49.67	8.27	29.4	61.8

but also for the possibility that the right-hand-side variables differently affect different population subsets. Descriptive statistics for EPR and for all regressors are reported in Table 1.

RealMinWage is the real value of the minimum wage (measured in 2012 prices). Since many states have adopted minimum wages above the federal minimum wage, our minimum wage variable is constructed as the population-weighted average of the minimum wage in effect in each state on July 1 of each year. We consider the minimum wage in effect in state s on July 1 of year t to be the maximum of the federal minimum wage in effect on July 1 of year t and state s's minimum wage on July 1 of year t. Since teens typically have little experience and few skills, the minimum wage might price some teen workers out of the labor market. Ceteris paribus, we hypothesize that increases in the minimum wage decrease the quantity of teen labor demanded thereby reducing the employment-population ratio. The inflation-adjusted minimum wage has declined during the

1972–2012 period. During this time period, the highest value was $9.33 in 1978, and the lowest value was $6.30 in 1996. The federal minimum wage rose in 1974, 1975, 1976, 1978, 1979, 1980, 1981, 1990, 1991, 1996, 1997, 2007, 2008, and 2009 so the variation in the real minimum wage over time comes from price level changes and statutory changes at both the state and federal levels. Figure 2 shows the changes in the real population-weighted effective minimum wage from 1972 to 2012.

ManufacturingEmployment is the share of workers employed in manufacturing and allows for the decline in manufacturing jobs over time to have differentially affected different groups of teens. According to the BLS, manufacturing employment fell from 17.7 million people in 1972 to 11.9 million people in 2012, though, of course, many of these jobs were not held by teens. Since manufacturing jobs were largely held by males, declines in manufacturing employment may explain the decline of summer jobs for male teens relative to female teens.[2]

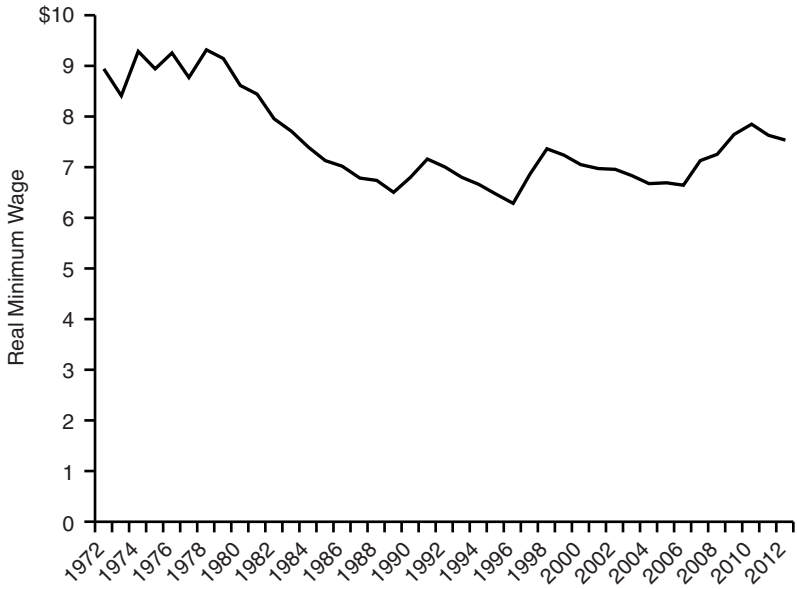
UnemploymentRate, our control for the business cycle, is the white male age 25–54 unemployment rate. We select this group to avoid simultaneity with the dependent variable. Other things equal, cyclical macroeconomic downturns should decrease teen employment.[3]

OlderWorkers is the employment-population ratio for workers over age 65. Increased competition from adult workers might reduce teen employment; this concern is particularly germane because the employment-population ratio of workers over age 65 has increased from 11.4 percent in 1997 to 15.4 percent in 2007. Several factors might increase older workers' labor supply. Schirle (2008) found

[2]In 1970, females were 28 percent of manufacturing workers (*Statistical Abstract of the United States 1980*: Table 674). The industries having smaller proportions of female employees (e.g., mining and construction) constituted very small percentages of the overall labor force and are therefore poor candidates for explaining the decline in teenage males' summer employment. Parker (1992) examines sectoral change and finds a larger effect for adult males than for adult females.

[3]Our expectation of a negative relationship between UnemploymentRate and the employment-population ratio is based on a decrease in the demand for teen labor. Increases in the overall unemployment rate could also increase the supply of teen labor, if households facing unemployment compensate by having secondary earners enter the labor force.

FIGURE 2
Population-Weighted Average of State Minimum Wages on July 1, 1972–2012
(Shown in 2012 Dollars)



Source: U.S. Department of Labor. Authors' calculations.

that one-fourth of the increase in older men's labor force participation is related to increased labor force participation by their wives. Vere (2011) reported that 1977 legislation reducing Social Security benefits caused a large increase in labor supply among older workers in the 1990s and early 2000s. Engelhardt and Kumar (2009) found that the repeal of the Social Security earnings test increased the labor force participation of older workers. When older workers obtain jobs typically held by teens, older workers crowd out younger workers thereby creating a negative relationship between OlderWorkers and the teen employment-population ratio.

The likelihood of going to college after graduating from high school has increased substantially over our study period, so the model also includes the college enrollment rate (CollegeEnrollment). The effect of increased college enrollment on teens' desire for summer employment is theoretically ambiguous. On one hand, college enrollment may increase students' desire for summer earnings and lead to

more teens working summer jobs. On the other hand, some college students may enroll in summer school instead of obtaining a summer job thereby leading to a negative relationship between college enrollment and teen employment.

EPR_{-1} is the lagged employment-population ratio for each demographic group. As noted by Neumark and Wascher (2004), including the lagged dependent variable can control for sluggishness in the response of employment to changes in labor demand and help account for omitted factors not already captured by the model's other explanatory variables.

For the black female and white female equations, we also include the teen birthrate as an explanatory variable. The presence of a young child could affect females' labor supply decisions, although the direction is not clear ex ante. On one hand, pregnancy, birth, and infant care might cause mothers to forgo working; on the other hand, the financial demands of a young child might cause teen mothers to seek jobs.

Results

Since the errors across demographic groups are likely correlated, the models for the four demographic groups are estimated simultaneously as a "seemingly unrelated regression." Results are reported in Table 2. The Breusch-Pagan test for independence of the equations rejects the null hypothesis of independence with a p-value of 0.0001. To further assess the appropriateness of SUR (seemingly unrelated regressions) instead of OLS (ordinary least squares), we also tested for equality of coefficients across the four specifications. The null hypothesis of equal coefficients is rejected (p-values less than 0.05) for manufacturing employment, the prime-age male unemployment rate, and the employment-population ratio of workers over age 65.

The estimated coefficient on the real minimum wage is negative for all four demographic groups and is significantly different from zero for all groups except white females. A $1.00 increase in the real value of the minimum wage is associated with a 1.8 percentage point drop in both the black male and black female employment-population ratios. These estimated minimum wage coefficients for black males and black females are roughly two times larger than for their white counterparts. The disparity in elasticities is even larger because of the lower employment-population ratios for blacks.

TABLE 2
Regression Results

Variable	White Male	Black Male	White Female	Black Female
Real Minimum Wage	−1.120**	−1.843*	−0.777	−1.785**
	(0.469)	(1.068)	(0.613)	(0.748)
Manufacturing Employment	1.254***	0.713*	−0.409	0.080
	(0.177)	(0.414)	(0.565)	(0.325)
Prime-age Male Unemp. Rate	−1.393***	−0.789**	−0.903***	−1.257***
	(0.173)	(0.397)	(0.234)	(0.251)
Older Workers Emp. Rate	−0.784***	0.176	−1.991***	−0.297
	(0.174)	(0.191)	(0.405)	(0.199)
College Enrollment Rate	−0.157	−0.371	−0.183	−0.146
	(0.116)	(0.232)	(0.214)	(0.142)
Teen Birthrate			−0.011	0.017
			(0.080)	(0.078)
Lagged Dependent Variable	0.309***	0.366***	0.433***	0.375***
	(0.067)	(0.121)	(0.092)	(0.099)
Constant	54.199***	33.516***	69.494***	43.823***
	(7.178)	(7.872)	(16.777)	(8.229)
R^2	0.98	0.88	0.96	0.83

Notes: Parentheses contain standard errors; *, **, *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. There are 40 observations.

Using the mean values of the real minimum wage and the employment-population ratios, the implied elasticity of employment with respect to the minimum wage is −0.41 for black males, −0.45 for black females, −0.14 for white males, and −0.11 for white females (though, again, the point estimate for white females is not statistically different from zero).[4] Our results are therefore similar to those in the existing literature (Brown, Gilroy, and Kohen 1982).

[4]These elasticities, derived from the estimated values of β_1, should be thought of as short-run elasticities because the model includes a lagged dependent variable. The full impact of a minimum wage change would be given by $[\beta_1/(1 - \beta_6)]$ and yields elasticity estimates of approximately −0.2 for both white males and white females, −0.64 for black males, and −0.72 for black females.

As for manufacturing employment, the large and statistically significant results in the white and black male regressions suggest that structural changes in the economy explain the convergence in male and female summer employment for teens (conditional on race). The estimated coefficients from the black and white male equations indicate that each percentage point decrease in manufacturing as a share of overall employment is associated with a 1.25 percentage point decline in the white male teen employment-population ratio and a 0.70 percentage point decline in the black male teen employment-population ratio.

Turning to the unemployment rate, the estimated coefficient is statistically significant for each demographic group; however, the magnitude of the relationship varies somewhat across groups. The impact is larger for white males and black females than for white females and black males. The estimated coefficients on OlderWorkers imply a significant negative relationship between white teens' employment and the employment of people over age 65, with the effect for white females being more than twice as large as the coefficient for white males. The coefficients for black males and black females are both small and not statistically different from zero.

The estimated coefficient on college enrollment is negative for all demographic groups, but the estimated effects are not statistically significant and are small for all groups except black males. Finally, the teen birthrate is not significantly related to either the black or white female teen employment-population ratio.

Conclusion

Vedder and Gallaway (1993: 294) concluded that inexperienced youths were among "the biggest losers from state intervention" in labor markets. Our results suggest that same conclusion may be reached about teen summer jobs over the past four decades. Even after controlling for the adverse effects on teen summer employment of increased labor force participation by senior workers, cyclical macroeconomic factors, and, for male teens, the decline in manufacturing employment, increases in the real value of the minimum wage are found to have detrimental effects on teen employment, particularly for black teens.

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