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6 Time Series Changes in Youth Joblessness

Michael L. Wachter and Choongsoo Kim

Youth unemployment has increased over the past two decades in absolute terms relative to prime-age male unemployment. More recently the unemployment rates for most youth groups have begun to level off and move in parallel with prime-age male unemployment rates. This is especially true for white males.

Explaining these developments in a statistical sense presents major problems. First, the underlying developments appear to be due to economic-demographic swings of intermediate-run duration. Hence the length of the time series data base is woefully short. Second, many of the most interesting and potentially important explanatory variables, such as government policy variables, present major measurement problems.

Our view stresses the role of "cohort overcrowding," which results from an imbalance between younger and older workers. The model is based on two central assumptions. The first is that younger and older workers are imperfect substitutes for each other. The main difference between them reflects their relative amounts of specific training. Given the "putty-clay" nature of physical and human capital and the transient nature of the cohort bulge, the economy's adjustment process may be slow and incomplete. In the short run, elasticities of substitution are relatively low so that large relative wage adjustments can occur.

The second is that aspiration levels or desired standards of living are formed when the younger workers are living with their parents. This is an endogenous taste or habit formation model in which past living standards

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influence current desired standards. In addition, young families are assumed to treat their desired standard of living as a necessity. Hence, in the event of lower wage levels, families will increase the number of workers and/or hours worked. The increase in labor force participation rates of the young workers can thus be traced directly to the population demographics. In addition, the induced change in participation rates serves to aggravate the existing problem of oversupply of younger workers, thus further driving down relative wages.

As relative wages fall for the oversized cohort, institutional constraints, such as government transfer programs, minimum wage levels, etc., become relevant and cause an increase in unemployment rates as well as or instead of the increase in participation rates. If the unemployment effects are large enough, employment may actually decline.

Although some previous studies have attempted to isolate the effects of government programs, for example of minimum wage legislation and manpower programs, data problems make this task almost impossible. Besides the data problems, there are important conceptual problems as well. The government's social welfare package, whether intentional or not, is an integrated program. The parameters of the various programs tend to change together reflecting common political pressures. An example is the parallel increase in minimum wage coverage and government transfer payments (in relative terms) during the late 1960s. Since almost all studies concentrate on one government program at a time, they miss these crucial interrelationships and hence attribute too much to the single program under study. We also find that "relative wages" have some explanatory power, but cannot separate minimum wage from government transfer effects. In addition, attempts to include direct job creation effects invariably yield the wrong sign.

Our empirical work focuses on two approaches. The first attempts to measure unemployment in different ways by altering the numerator and/or the denominator of the unemployment rate term. For example, we argue that the variable which is closest to the traditional measure of unemployment would give school attendence equal status with employment. Hence the numerator would exclude those who were unemployed and whose primary activity was school and the denominator would include all of those who were in school. The second approach focuses on disaggregating youth activities into four categories: unemployment, employment, school, and a residual (all as a ratio to the population) for each of the age-sex-race groups. Equations are then estimated using the same explanatory variables and adding the constraint that the four ratios sum to unity.

Since black males pose a particular problem, we concentrate somewhat on the deterioration in the unemployment and employment ratios of this group relative to other youth groups. Why should this group suffer a

deterioration in labor market position relative to other youth groups, including black females?

6.1 The Basic Model of Cohort Overcrowding

6.1.1 The Underlying Workings of the Model

In some earlier work by the authors and others, the youth unemployment problem was explained in the context of a broader economic-demographic model.[1] The basis of the model is a "cohort overcrowding" effect which results from an imbalance between younger and older workers. We shall utilize this approach to explore the developments in youth unemployment over the past fifteen years. It was during this period that the baby boom cohort was passing through the 16–24 age category.

This type of model can generate cyclical swings of intermediate length in unemployment rates. A fertility increase in generation t causes a large cohort of entry level workers in $t + 1$. In the short run, elasticities of substitution are relatively low so that large relative wage adjustments occur. This deterioration in the income potential of young people causes a decline in fertility and family formation rates and an increase in the labor force participation rates of secondary workers. The increase in young workers' labor force participation rates can thus be traced directly to the population demographics. In addition, the induced change in participation rates serves to aggravate the existing oversupply problem of younger workers.[2]

As relative wages fall for the oversized cohort, institutional constraints become relevant and cause an increase in unemployment rates as well as or instead of the increase in participation rates. If the unemployment effects are large enough, employment may actually decline.

The institutional constraints that cause unemployment can exist on both the demand and supply sides of the market. For example, since minimum wage levels are informally indexed on average economy-wide wages, a decline in the relative wage for youths may cause the market clearing wage to fall below the minimum wage. Youths, of course, form a heterogeneous skill group with a wage distribution rather than a single wage. The decline of the relative wage, in this case, causes an adverse shift in the distribution of wages. That is, the probability of any youth having a skill and associated wage level that falls below the minimum wage is increased by the demographic overcrowding.

On the supply side, a different institutional factor is operating but with a similar potential result. In both neoclassical labor supply literature as well as institutional literature, workers are viewed as having a reservation wage; when market wages are below that reservation wage, individuals choose not to work. The neoclassical theory tends to specify a continuous

trade-off between hours of work and wage rates. It is only at the corner of the indifference map that the wage rate is sufficiently low so that individuals will offer zero hours of work. The likelihood of a corner solution is increased by the existence of public assistance and government transfers in general. These programs have high implicit tax rates. Indeed, it is generally acknowledged that the eligible poverty population for these programs face higher implicit marginal tax rates than do the wealthiest individuals. The result of these programs is to considerably flatten the budget constraint.[3]

The likelihood of a corner solution is also determined by the mechanism through which individuals form their reservation wage. Specifically, individuals' attitudes toward an acceptable wage are determined by wages paid elsewhere in the economy. Of particular importance in defining the indifference map or "taste" for work is the minimum income level dictated by the government social welfare programs and minimum wage laws. These programs signal what constitutes an acceptable minimum wage to the voting public and policymakers. That is, government programs almost certainly influence the shape of the indifference map as they alter the budget constraint. A liberalization of benefits shifts both the indifference map and the budget constraint toward the corner solution of zero work.[4]

It should be noted that the fluctuations in unemployment discussed in this model are solely related to changes in the equilibrium rate of unemployment. Cyclical unemployment may be positive or negative in the short run, but the demographic cycle outlined above is an intermediate swing and averages out the peaks and troughs of the short-run business cycle.

6.1.2 A Simple Expositional Model[5]

The major factors that we use in our empirical work can be captured in a simple expositional model. The model is oriented toward the specific empirical factors involved in the demographic shift. To start, assume a production function that recognizes two different categories of labor: older workers who have accumulated specific training (L_A) and younger workers who lack such training (L_B). For our purposes we can view L_A as skilled workers and L_B as unskilled workers. In the long run, the production function can be written as:

$$X^s = f^s\,(L_A{}^s,\ L_B{}^s,\ K) \tag{1}$$

where K is the capital stock, X is the level of output, and the superscript s refers to supply. In the short run, there appear to be significant lags in achieving desired absolute and relative levels of factor inputs. The lags may arise for a number of reasons including adjustment and expectional factors. The literature on investment functions indicates that long lags are

especially relevant to the capital input. If the capital stock is "putty-clay," the input coefficients are fixed as part of the capital endowment. These coefficients may vary for different vintages but, to the extent that they are empirically important, they impart a difficulty in substituting against scarce factors in the short run.

For our purposes, aggregate demand can be viewed as being controlled by monetary (M) and fiscal (F) policies, subject to unanticipated changes in demand from the private sector (X_0):

$$X^d = f^d\ (M,\ F,\ X_0) \tag{2}$$

The derived demand for labor is constrained by either the level of the demand for or supply of output X and by relative factor prices. For B workers, the relevant own wage is either the minimum wage (MW) or a market wage, whichever is higher.

The labor supply for both L_A and L_B is a function of the population in each cohort and the factors that determined the labor force participation rates. For A workers, we assume that the participation rate (r_A) is constant in the short run. Abstracting from influences such as school enrollment and fertility, the main forces determining participation for B workers are the market wage rates for these workers (W_B), the government transfer payments for being unemployed (T_g), the effective minimum wage (MW), and some unspecified trend factors that capture changes in lifestyle. That is,

$$L_A{}^s = L_A{}^s\ (r_A,\ POP_A) \tag{3}$$

and

$$L_B{}^{s'} = L_B{}^{s'}\ (POP_B,\ TREND,\ g\ \{W_B,\ T_g,\ MW\}). \tag{4}$$

The relationship between W_B and T_g determines the cost of being unemployed. The level of government transfers depends upon unemployment compensation and public assistance. The supply of labor relevant to the production function, denoted $L_B{}^s$, is

$$L_B{}^s = L_B{}^{s'} - g\ (\mathrm{W_B},\ T_g,\ MW) \tag{5}$$

That is, we distinguish between an observed labor supply, and $L_B{}^{s'}$, and an effective labor supply, $L_B{}^s$, which is available for employment. The discrepancy, measured by the g function, is a type of structural unemployment.[6]

Equations (1) through (5) indicate a number of reasons for unemployment. The most obvious is cyclical unemployment which results from $X^s > X^d$. In addition, unemployment will vary with (1) the distribution of the labor force between A and B workers, (2) the cost of being unemployed and minimum wage effectiveness, and (3) the bottlenecks of either skilled workers or capital. Over the longer run, when coefficients

of production are more flexible, bottlenecks gradually lose their importance as a cause of unemployment. On the other hand, traditional wage equations indicate another source of unemployment. As bottlenecks loosen, relative wages must adjust if the surplus of B workers is to be absorbed. The evidence suggests, however, that the adjustment is very imperfect. Minimum wages prevent employers from moving down their demand curve for B workers and/or altering the reservation wage of B workers. In addition, government transfer programs help to maintain a high reservation wage (relative to their market wage) for the unskilled workers. These latter workers are in the labor force, but are not willing or able to work at the market clearing wage.

6.2 The Reduced Form Unemployment Equation

6.2.1 Basic Considerations

Estimating an unemployment function can be done in several ways given the basic building blocks of labor supply and employment functions. For our purposes it is useful to start by estimating a reduced form relative unemployment equation. In section 6.4 we shall estimate both unemployment and employment functions. In this case the unemployment equations serve the role of a labor supply equation. This approach is compatible with the theory outlined above and the fact that prime-age male unemployment is an independent variable. Specifically, it highlights our view that youth unemployment is largely structural in nature and dominated by fluctuations on the supply rather than demand side of the market. For reasons associated with government policy and the dynamics of the overcrowding model, supply side shifts do not induce adjustments in labor demand.

A reduced form relative unemployment equation can be obtained from equation (5) with the additional assumption that fluctuations in $L_B^{s'}$ are captured by a cyclical aggregate demand variable. For most of our calculations, we used the prime-age male unemployment rate.[7]

A large number of alternative proxies were attempted for the government policy variables. None were particularly satisfactory because of measurement errors; essentially, most of the data were simply not collected. Our various attempts at representing policy impact are described below. No single policy variable provided the best fit among the eighteen age-sex-race groups. Rather than use different policy variables in each equation, we adopted a compromise variable that performed as well as the others but could be viewed as representing several effects. The unemployment rate equations for the various age-sex groups are estimated in the general form:

$$(6) \qquad U_i = a0 + a_i \{Si\} + a_2 \ln (U_{PM}) + a_3 \ln (RPy) + a_4 \ln (W/MW) + a_5 (\ln (AF/POP)) \text{ or } TREND$$

where $\{Si\}$ is a vector of seasonal dummies, RPy is the proportion of the civilian population aged 16 to 24 to the population aged 16 +, AF/POP is the military/population ratio (added to the male equations), and $TREND$ is a time trend (added to the female equations).

The RPy variable represents the cohort overcrowding referred to above. Several different specifications of the RPy variable were tried, varying the treatment of the military, individuals over 65 years of age, and defining youth from the ages of 16 to 34. The results were largely unchanged. Given this inability to differentiate empirically, the choice of the RPy variable was dictated by usage in earlier studies. It is important to note that this cohort variable assumes that young workers are substitutes for one another and define a distinct labor input. Needless to say, any age division of the labor market into two distinct components has to be arbitrary. The difference between a 24 and a 25 year old is not large. On the other hand, labor market attachment, employment patterns, unemployment rates, etc., differ considerably for a 20 year old compared with a 30 year old.

Some recent studies have used separate supply or cohort variables (denoted RPy_i) for each of the youth age-sex groups.[8] For example, the black male population aged 18–19 as a percentage of the population aged 16 + would be used to explain unemployment of the age-sex-race group. Our view is that this is too limiting a view of the degree of substitution across inputs. Labor market behavior over the past two decades shows more similarities than differences across youth age-sex-race groups. Where the RPy_i variable has been successful, it was only capturing the worsening unemployment position of black youths relative to white youths.[9] As will be discussed below, however, black youths are not doing worse than comparable white groups by all economic yardsticks. Black school enrollment rates and relative wages, for example, show significant relative improvement. This suggests that RPy_i will not provide a consistent answer to the changing white-black differential.

6.2.2 The Government Policy Variable

Although a properly specified unemployment equation should contain separate variables to represent transfer payments, direct job creation, and minimum wages, data and conceptual problems made this impossible. After considerable but largely unsuccessful experimentation with different proxies for the various programs, the actual government variable utilized in the equations is a "compromise variable" of the form W/MW where W is the average hourly earnings of workers 16–24 years of age and MW is the minimum wage.[10]

Measurement problems are complicated by the fact that the social legislation programs including transfers, minimum wages, and direct job creation are not made independently of each other. That is, policy innovations in one program are likely to be reflected in others. Basically, political and social pressures do not become concentrated in one area. Rather, as was clearly the case during the 1960s and 1970s, the forces that can yield changes in one policy area are also likely to cause similar changes in other areas.

Most of the literature dealing with federal welfare initiatives investigates only one program at a time. There are studies on minimum wages, public assistance, direct job creation, etc., but few of these studies attempt to integrate the direct labor market impact of that single study into the overall package of programs. The limited range of individual studies is easily explainable given the data problems for each single study. The problem, however, in evaluating the overall effect of the various government programs on unemployment is that the programs interact. The sum of the impacts of the individual studies does not equal the overall effect of the variety of programs evaluated together.[11]

The data problems are due to the fact that the major change in the minimum wage is the change in coverage in 1967. Until the 1978 law, however, little other meaningful variation in that variable is evident. Many of the increases in coverage did not affect low wage workers and the staggered catch-up increase in the minimum wage created a saw-tooth pattern in the data with, if anything, a slightly declining trend of the MW relative to W. That is, the time series minimum wage variable is largely a spike in 1967. This, of course, is difficult enough to represent using time series data. Suppose, however, as is likely, that firms adjusted with a lag to this sweeping change in coverage. One possibility is an exponential declining distributed lag response. Depending upon the speed of decay, this would move the mean of the response outward in time, probably to 1968 or 1969. Alternatively, firms may have responded very slowly at first. This may have included low levels of compliance or incomplete compliance in the year immediately after 1967. With a compliance lag and an employment response lag conditional on compliance, the distributed lag structure could resemble a parabola with a mean lag into 1970 or beyond.

Given these possible time profiles for W/MW, and the difficulty of isolating the best fit in the various equations, it is possible for W/MW to move in near precision with transfer, supply-side variables. Moreover, as mentioned above, this multicollinearity may be a conceptual as well as a data problem. To the extent that individuals form their reservation wages as a function of MW and transfer payments are adjusted to conform to the same underlying inflation and real income changes effects, the MW construct may be a good approximation of the reservation wage. To the

extent that the minimum wage helps to determine the reservation wage of low wage workers, the greater the difficulty in differentiating supply and demand effects.[12]

6.2.3 Empirical Results for the Reduced Form Unemployment Equation

Given a lack of agreement or data on the control variables, especially government policy variables, to be introduced into the unemployment equation, it is useful to start with the simplest equation. Shown in table 6.1, this equation only includes *RPy*, U_{PM} and the seasonal dummies. As can be seen, the coefficients of *RPy* are all positive and indicate higher elasticities for females and blacks.

Since the "cohort overcrowding" effect operates like a trend variable for half of the sample period, namely between 1958 and 1972, it is useful to see if *RPy* is simply picking up a trend effect. Prior to 1958, *RPy* is either stable or declining and after 1972 it remains largely unchanged. The question is whether youth unemployment, after controlling for U_{PM}, is best approximated by a *TREND* or a cohort overcrowding variable. Of the eighteen age-sex-race groups, the equation with *RPy* instead of a

Table 6.1 **Unemployment Equations with Demographic Overcrowding Variable 1954:1–1978:4**

	Male			Female		
Age/race	*RPy*	U_{PM}	$\bar{R}^2/DW$	*RPy*	U_{PM}	$\bar{R}^2/DW$
16–17						
Total	1.0424	.3347	.796/1.832	1.1466	.2382	.748/1.908
	(14.82)	(12.37)		(11.77)	(6.36)	
White	.8592	.3528	.760/1.808	1.0103	.2667	.707/2.078
	(11.22)	(11.98)		(9.34)	(6.41)	
Black	2.2524	.2879	.728/1.478	2.0174	.1515	.658/1.490
	(16.19)	(5.38)		(13.37)	(2.61)	
18–19						
Total	.4446	.5576	.843/1.337	1.2097	.2881	.743/1.188
	(6.40)	(20.86)		(14.24)	(8.82)	
White	.2386	.5862	.836/1.404	1.1605	.3137	.675/1.200
	(3.13)	(19.97)		(11.31)	(7.95)	
Black	1.4952	.4938	.638/1.140	1.2334	.2403	.617/1.589
	(10.99)	(9.43)		(11.90)	(6.02)	
20–24						
Total	.5090	.8548	.910/ .702	1.1347	.5098	.891/1.360
	(6.68)	(29.16)		(19.67)	(22.97)	
White	.4733	.8629	.893/ .728	1.2004	.5158	.874/1.388
	(5.51)	(26.12)		(18.43)	(20.59)	
Black	.7793	.8352	.760/ .879	.9269	.4782	.652/1.101
	(6.06)	(16.87)		(8.77)	(11.76)	

TREND yields a higher $\bar{R}^2$ in fifteen equations. This provides mild support for the *RPy* variable. Given their collinearity, it is not possible to distinguish between *RPy* and *TREND* to the desired extent. Beginning in the late 1970s, however, these two variables diverge sharply. The *RPy* variable tends to be strongest in female and white male equations and weakest in black male equations. This pattern will appear with consistency regardless of the exact specification and/or the sample period of the equation.

These results suggest that secular or intermediate swings in female and white youth unemployment rates do track well with *RPy*. The implication is that the unemployment rates of youth groups have largely peaked relative to prime-age male unemployment rates. Needless to say, we would be more comfortable with this conclusion if the data period were longer and included several complete intermediate swing cycles. The unemployment data by race, however, does not predate the 1950s, and the unemployment data by age and sex is only available after the late 1940s.

The black male 16–24 age groups are the major exceptions to the notion that youth unemployment rates may have peaked. Since their unemployment rates continue to rise, the *TREND* variable has a larger *t* statistic than *RPy* in the black male equations. A major problem is to explain this divergence between black male youth unemployment rates and those of other youth groups.[13]

6.3 Other Indicators of the Labor Market Status of Youths

Youth unemployment is a more complex phenomenon than unemployment for other age groups. Essentially, the unemployment rate construct is not attuned to the unique features of the youth labor market. Rather, it is based on the type of frictional and cyclical unemployment that is most relevant to prime-age males and, in general, to workers with a strong labor market attachment.

Youth unemployment, on the other hand, is much more difficult to categorize. The key difference is that prime-age males tend to be in the labor force year round, full time (either employed or unemployed), and youths are frequently moving among jobs or into and out of the labor force. Of the 4.24 million males aged 18–19, for example, only 2.37 million were in the labor force and not in school in 1978. Of the 4.23 million males aged 16–17, only 1.12 million were in the labor force and not in school. Furthermore, since these numbers are annual averages (and thus include the summer months when many youths are not in school), they overstate the number that is in the labor market and not in school for the remainder of the year.

Essentially, there are many options open to youths, besides being in the labor market, that fit into traditional roles. Young people, for example, can be in school, in the military, or at home beginning to raise their own families. In addition, they can combine these different activities; for example, a disproportionate number of youths who are in the labor market are part-time workers. An increasing percentage of these young people combine being full-time students and part-time workers. Moreover, the choice of activities shifts frequently over the years. Relatively few young people aged 16 to 19 work year round, full time. One traditional pattern for this group is to work full time only during the summer months. Yet even for those who are not in school, changes in status between being employed, unemployed, and out of the labor force can occur several times over the year.

Of importance for an evaluation of the unemployment issue is that, from society's perspective, working year round, full time is not necessarily the most desirable activity for a young person. Particularly for teenagers, attending school may be preferable to working. For some male youths, serving one's military obligation ranks above civilian employment. For young females, staying home and raising a family may be viewed as preferable to working.

Given this perspective, determining the youth unemployment rate presents four major problems. First, since many if not most youths are not in the labor force at any given time, the unemployment rate is a very incomplete measure of that group's economic position and well-being. Second, since youths move frequently among employment, unemployment, and various nonlabor market activities, and are disproportionately part-time workers when they work, their unemployment incidence should be higher than for other workers who have stronger attachments to their jobs. Third, since having a job is not necessarily the preferred activity and for some youth age groups is likely to be less desirable than schooling, changes in the unemployment rate may provide incorrect information as to the nature and extent of changes in the economic conditions in youth labor markets. Fourth, since many youths do not have a firm labor market attachment, the question of whether they are "actively" seeking work (and thus are unemployed by the BLS definition) is often a matter of opinion and this leads to a considerable measurement error.[14]

Our initial approach is to develop alternative unemployment rate indicators and to analyze how they vary over time. These new indicators for 1978 are shown in table 6.2. The point is not that one is better than the other, but rather that each provides a different and useful perspective on the problem. Our U_1 measure simply adds the military to the denominator of the unemployment rate. Including the military in the denominator

Table 6.2 Alternative Measures of Unemployment, 1978

	U or BLS unemployment rate[a]	U_1 or unemployment divided by labor force + military[b]	U_2 or unemployment divided by labor force + school + military[c]	U_3 or unemployment of nonenrollees divided by labor force + school + military[d]
Male				
White				
16–17	17.1	16.9	10.1	4.8
18–19	10.9	10.0	8.0	6.1
20–24	7.6	7.1	6.4	5.8
Black				
16–17	40.7	39.9	15.4	7.8
18–19	30.9	26.3	18.5	14.2
20–24	20.1	17.3	15.2	13.6
Female				
White				
16–17	17.1	17.1	9.8	4.8
18–19	12.3	12.3	9.5	7.6
20–24	8.3	8.2	7.5	6.9
Black				
16–17	41.9	41.9	14.8	8.7
18–19	36.8	36.4	23.8	18.4
20–24	21.6	21.3	18.6	16.8

[a]Measured as U/L where U is the number of unemployed and L is the civilian labor force.
[b]Measured as $U/(L+M)$ where M is the number in the military.
[c]Measured as $U/(L+M+S-(S\cap L))$ where S is the number in school and $(S\cap L)$ indicates those who are both in school and in the civilian labor force.
[d]Measured as $(U-(U\cap S))/(L+M+S-(S\cap L))$.

of U_1 is an obvious addition since that construction is used by the Bureau of Labor Statistics and is referred to as the total (as distinct from civilian) labor force. Our U_2 measure is constructed by adding those in school and those in the military to the denominator of the unemployment rate; that is, $U_2 = U/(L + M + S - (S \cap L)$.[15] Including individuals in school (but not including these individuals in the labor force since they are already included in L) is controversial, but useful. Schooling can be viewed not only as a type of employment, involving general human capital training, but also as the preferred activity for many of the youth groups. Including schooling and military in the denominator, to yield an augumented labor force (ALF), helps to control for shifts among these activities which

result in fluctuations in the unemployment rate that may be related to labor demand conditions.

The U_3 construct, also depicted in table 6.2, moves further toward treating schooling on a par with employment. Workers, specifically those who want to moonlight and work at more than one job, can be both employed at the first job and unemployed while looking for the second job. According to the definition of unemployment, however, such a worker is counted as employed but not counted as unemployed. The same issue arises when schooling is included. If individuals are in school, should they also be counted as unemployed if they are looking for a job as well? The U_2 measure does count them as unemployed. It is useful, however, to establish a U_3 measure which excludes this group from the unemployment pool. The U_3 variable is defined as $(U-(U\cap S))/(L+M+S-(S\cap L))$.

The justification for this is that individuals whose major activity is school are likely to be part-time workers with a relatively marginal attachment to a job. The fact that they are in school indicates that they will soon be looking for a different kind of job. Moreover, reporting errors for this group are especially large. What constitutes active job search for full-time students who are looking for part-time jobs?

Whether or not one agrees with this argument, U_3 is still an interesting measure of unemployment. Correctly interpreted, it is the nonenrolled unemployed youths as a percentage of the population that is in school, in the military, or in the labor force. The difference between U and U_3 is even larger than that for U and U_2. First, the unemployment rates are again reduced considerably, with the largest reductions affecting the youngest age group. For example, for white youths aged 16–17, the U_3 rate is 4.8%. If schooling is viewed as a job (an investment in human capital for future productivity), then this age group is nearly fully employed. Furthermore, one can make a good argument that the U_3 definition is closer to the meaning of unemployment for adults than is the BLS unemployment definition.

Essentially, white youths aged 16–17 are largely in school. The school enrollment rate for white males aged 16–17 as an annual average was 63.7% in 1978. But as mentioned above, teenage labor force statistics need to be inspected for the nonsummer period as well along with the annual average. For example, during the first quarter of 1978, the school enrollment rate for white males aged 16–17 was 81.4%. The U_3 rate in the first quarter of 1978 was 2.6% while the rate in the third quarter was 9.0%. That is, most of the 16–17 year old white males are in school in the winter and many of these are unemployed during the summer. The U_3 rate for white males aged 16–17 during the winter, however, is below the unemployment rate for white prime-age males.

Even for blacks aged 16–17, unemployment is largely a summer-time phenomenon. For black males aged 16–17, U_3 is only 7.8% compared with a BLS measured unemployment rate of 40.7%. Looking at the first quarter of 1978 instead of the annual data, the U_3 rate falls to 4.0%.

An important feature of table 6.2 is to show that black unemployment for the 18–24 age group remains a problem even after moving from a U_2 to a U_3 construct. Having narrowed the definition so that it only covers the nonenrolled unemployed as a percentage of the school and work forces, it is disturbing that the resulting U_3 measure is still approximately 15% for nonwhites. Moreover, the black U_3 rates for the 18–24 age groups are still more than double the white U_3 rates for comparable groups.

The basic equations containing *RPy and* U_{PM} as independent variables were estimated for the various unemployment constructs. Since the schooling data at the desired level of disaggregation are only available from 1962, the sample period is shortened to 1962:4 through 1978:4. For comparison purposes, the U equations of table 6.1 are reestimated for the shorter time period.

The results support the notion that the alternative unemployment rate indicators, and especially U_3, may be a better cyclical indicator of youth unemployment than the BLS unemployment rate measure. For example, in all but one male equation, the coefficient of U_{PM} is higher when U_3 rather than U is the dependent variable. In the female equation, the coefficient of U_{PM} is also larger for U_3 than U for all the younger groups (where the school population is a significant percentage of the total). Only for the female groups aged 20–24 are the coefficients insignificantly different from one another.[16]

6.4 The Alternative Activity Equations: Employment, Unemployment, School, Residual

6.4.1 Background

Analyzing the labor market and general economic status of youths by focusing on unemployment presents severe problems. The Bureau of Labor Statistics divides the youth population into four categories on the basis of major activity. The categories are employment, unemployment, schooling, and residual (denoted R). Of these four divisions, the unemployment category is the smallest. Furthermore, the response error for unemployment is considerably larger than for employment and schooling. Especially for youths who may be either in school and looking for a part-time job or out of school for the summer and interested in working, the BLS question that refers to "actively" seeking work is ambiguous. Indeed, for most youth groups and particularly for teenagers, the notion of unemployment and hence labor force is sufficiently flawed and is a weak statistic for policy purposes.

To avoid concentrating solely on unemployment, we suggest a strategy of studying employment, unemployment, schooling, and the residual categories together. This allows for the observation of flows across categories. For example, it is useful to know whether a change in U_{PM} causes a net increase in the schooling (S) or residual (R) categories.[17]

One problem with the alternative activity equation approach is that the residual category, R, includes both some of society's most advantaged and disadvantaged youths.[18] At one extreme, it includes high school dropouts who have such low skill levels that they cannot find a job, youths from welfare families who would cost their families their eligibility if they accepted a job, and youths who are in poor health. On the other hand, it also includes a large number of young females who are beginning to raise their families, teenagers who are taking the summer off, and relatively skilled youths who are pursuing other activities for a short period of time between jobs and/or school.

There is a tendency among some researchers to interpret an increase in E/P as a positive development, especially if it does not parallel a decrease in S/P. The work ethic aside, there is little basis for this view. Although it would be an easier problem if R only included problem nonworkers, our inspection of the data suggests that this is not the case.

In the equations, we disaggregate the age-sex-race youth population into four mutually exclusive categories. The categories are U/P, $(E + M)/P$, $(S - (S \cap L))/P$ and R/P. These dependent variables were regressed with the same set of independent variables, as indicated in equation (6), with the exceptions that the percentage in the military were included in the male equations and a time trend was included in the female equations.

By construction, the sum of the four dependent variables should be equal to one. The problem in estimating these dependent variables by single equation techniques is that the linear restriction across equations may not be satisfied. In order to estimate the coefficients of the explanatory variables for these four choices, subject to the linear constraint across equations, we used the logarithm of the pairwise odds as the dependent variables. To illustrate, denote the four youth categories as P_i, $O < P_i < 1$, $i = 1, 2, 3, 4$, and $\sum_{i=1}^{4} P_i = 1$. The dependent variables are then $\ln (P_i/P_1)$, $i = 2, 3, 4$. The regressions determine the ratios of the probabilities. The absolute values can then be estimated using the condition that the sum of probabilities is equal to unity. The implicit coefficients of the respective independent variables can be obtained by numerical estimation. Based on the coefficients from the P_i/P_1 equations, the probabilities were computed by changing one specific right-hand side variable by 1%. These computed probabilities were compared with the corresponding original estimates to derive the implicit elasticities at a given period. These numerically derived elasticities for the third quarter of 1978 are reported in tables 6.3–6.6 by each variable.[19]

Table 6.3 **Implicit Coefficients Derived From Constrained Equations: Implicit Coefficients of *RPy*, 1978:3**

	Male				Female			
Age/ Race	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4
16–17								
Total	−.5909	.8093	.2441	−.3843	.8157	.0371	−.0525	−.443
White	−.9068	1.0256	.4418	−.7449	.7697	.2165	−.0864	−.380
Black	1.0749	−.3633	−1.5747	.7839	1.6187	−.6933	−.3870	−.755
18–19								
Total	.3485	.3224	−.4480	2.5670	1.7067	.3337	−.5336	.448
White	.1132	.4435	−.3748	2.5505	1.5159	.4852	−.4748	.522
Black	1.5348	−.5643	−1.0509	3.1120	3.5698	−.0459	−1.6399	.319
20–20								
Total	1.4642	.7323	−.3295	2.6901	1.0297	−.2925	−.3222	.69
White	1.1024	.8918	−.2889	2.7870	.7907	.5532	−.4256	.83
Black	5.4521	−.1343	−.6818	2.1400	2.8986	−2.3216	.2857	.08

Table 6.4 **Implicit Coefficients of U_{PM}, 1978:3**

	Male				Female			
Age/ Race	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4
16–17								
Total	.1051	.2411	−.1001	.0254	.0160	.2273	−.0958	.050
White	.1093	.3160	−.0858	−.0097	.0271	.2710	−.0872	.037
Black	.0897	−.1031	−.1872	.1631	−.0369	.0528	−.1830	.120
18–19								
Total	.0155	.5534	−.0963	.1544	−.0505	.3350	−.0819	.080
White	−.0074	.6405	−.0826	.1137	−.0790	.3993	−.0728	.089
Black	.1227	.2558	−.2043	.3296	.0835	.1556	−.1684	.054
20–24								
Total	.0600	.7820	−.0824	.1745	−.0599	.4918	−.0618	.017
White	.0415	.8370	−.0736	.1718	−.0905	.5376	−.0440	−.003
Black	.2345	.5909	−.1527	.2104	.1207	.3387	−.1908	.139

6.4.2 The Impact of *RPy*

For the constrained *U/P* equations, six of the male and five of the female equations had the anticipated sign of *RPy*. It is interesting that the incorrect signs appeared in the black equations in all but one case. Does this suggest that the labor market position for black youths has improved with demographic overcrowding?

Table 6.5 **Implicit Coefficients of *W/MW*, 1978:3**

	Male				Female			
Age/ Race	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4
16–17								
Total	−.4774	−.2136	.2570	−.0707	−.5827	−.4211	.2082	.200
White	−.4453	−.4525	.2851	−.1431	−.4966	−.4343	.1844	.135
Black	−.7215	.6640	.2238	.1209	−1.0165	−.4865	.9728	.389
18–19								
Total	−.4771	−.6632	.1911	−.2976	−.6243	−.2121	−.1622	−.03
White	−.4762	−.7328	.1491	−.1151	−.5837	−.1601	.1303	−.05
Black	−.4218	−.3860	.4460	−.7857	−.8797	−.2416	.4702	.010
20–24								
Total	−.5435	−1.2411	.1825	−.6549	−.0539	−.1235	.0831	−.157
White	−.4791	−1.2867	.1576	−.6283	.0216	−.0401	.1137	−.291
Black	−1.0187	−.9860	.3465	−.6807	−.5657	−.3967	−.1476	.590

Table 6.6 **Implicit Coefficients of *AF/POP*, 1978:3**

	Male			
	$\frac{S-(S\cap L)}{P}$ P1	$\frac{U}{P}$ P2	$\frac{E}{P}$ P3	$\frac{R}{P}$ P4
16–17				
Total	.1535	−.1499	.0165	−.0944
White	.1979	−.1134	.0129	−.1351
Black	−.0022	−.3133	.1300	.0347
18–19				
Total	.2845	−.1509	−.0441	.1914
White	.3158	−.1082	−.0534	.2297
Black	.1484	−.2810	.0060	.1768
20–24				
Total	.2354	−.3668	.0185	−.0174
White	.2666	−.3181	.0035	.0767
Black	.0940	−.4651	.1108	−.2696

To analyze this puzzling result, it is necessary to evaluate the other three activity equations. The equations indicate that the negative coefficients of *RPy* in the *U–P* equations do not indicate an improvement in blacks' labor market position. Of particular importance are the *E/P* equations. For all but three of the eighteen equations, *E/P* is negatively related to *RPy*. The only equation for blacks in which the coefficient is positive is with females aged 20–24. Moreover, the implied elasticities of

RPy in the E/P equations are considerably larger for blacks than for whites.

The public policy debate on youth unemployment invariably is in terms of the BLS unemployment rate variable, *U/L*. It is therefore useful to convert the *U–P* and *E/P* equations of tables 6.3–6.6 so that their implications for the more traditional unemployment rate variable can be analyzed. The results are shown in table 6.7. Column 1 of table 6.7 shows that the elasticity of *U/L* with respect to *RPy* has the anticipated positive sign in all but two equations (black females aged 16/17 and 20–24).

The results of tables 6.3–6.7 make it clear that both black and white youth labor market positions are adversely affected by demographic overcrowding. However, the response pattern of the two groups differs. For white youths, unemployment increases are large and are not offset by changes in labor force participation rates. For black youths, the unemployment response to *RPy* appears to be low, but this is mainly because of a sharp decline in participation rates.

Given the linear restriction across equations, an increase in one of the P_i's requires a reduction in another. What happens to those workers who are not employed as a result of cohort overcrowding? The implicit coefficients of *RPy* in the $(S-(S\cap L))/P$ and *R/P* equations provide an answer.

Essentially, an increase in *RPy*, *ceteris paribus*, leads to an increase in *U/P*, a decrease in *E/P*, an increase in $(S-(S\cap L))/P$ and an increase in *R/)P*. The displaced employed workers largely migrate to full-time school

Table 6.7 **Percent Change in Unemployment Rates[a] Due to One Percent Change in Respective Explanatory Variable in 1978:3, Derived from Constrained Equations**

	Unemployment rates						
	Male				Female		
Age/ Race	*RPy*	U_{PM}	*AF/POP*	*W/MW*	*RPy*	U_{PM}	*W/MW*
16–17							
Total	.4694	.2844	−.1387	−.3916	.0695	.2567	−.5133
White	.4956	.3430	−.1078	−.6284	.2511	.2879	−.5268
Black	.8095	.0556	−.2928	.2896	−.1867	.1407	−.8876
18–19							
Total	.6835	.5744	−.0944	−.7545	.7408	.3638	−.3109
White	.7403	.6523	−.0495	−.7951	.8408	.4122	−.2473
Black	.3703	.3472	−.2166	−.6260	1.0294	.2070	−.4498
20–24							
Total	.9804	.7962	−.3548	−1.3103	.0281	.4964	−.1873
White	1.1025	.8486	−.2998	−1.3451	.9174	.5505	−.1262
Black	.4660	.6293	−.4872	−1.1259	−2.0224	.4125	−.1907

[a]Unemployment rates $\equiv U/(E+U+M)$.

and/or to household activities. This is not, however, the complete story of the demographic overcrowding because of the *ceteris paribus* assumption. For example, government policy, responding to the effects of demographic overcrowding, may also affect the distribution of the youth population across the four activity categories. When the *AF/POP* and *W/MW* are removed from the schooling equation, the sign on *RPy* becomes negative for white males. In addition, the *TREND* term poses obvious problems in the female equations. Since the intermediate-run demographic swings are highly correlated with a trend variable over the short estimation period, it is likely that *TREND* will capture some of these affects. That is, *RPy* does not reflect the full effect of demographic overcrowding because changes in other variables should also be anticipated.

6.4.3 The Impact of U_{PM}

The cyclical variable, U_{PM}, produced the anticipated results. As illustrated in table 6.3–6.6, increases in U_{PM} are associated with little change in schooling; an increase in U/P with a decrease in E/P and an increase in R/P.

The elasticities of U/P with respect to U_{PM} are the largest for white males. In addition, the elasticities tend to be larger for whites than for blacks, for males than for females, and for older than for younger workers. For all age-sex-race categories the elasticities are less than unity.

The overall results suggest a ranking of youth groups in terms of the cyclical versus structural sensitivity of their unemployment rates (U/P). In general, youths are more structurally than cyclically sensitive in comparison with adults. Females and the youngest youth groups are the most sensitive group to structural rather then cyclical swings in unemployment.

The ranking is also reflected in industry employment. For example, the older male groups have a high concentration of employment in the high-wage, cyclically sensitive industries such as mining, manufacturing, and construction. The younger and female groups are more heavily represented in the low wage, acyclical industries such as retail and service. Industry employment patterns, however, cannot be viewed simply as a causal factor in the unemployment behavior of these groups. Rather, the underlying structural features of these groups' labor market behavior is likely to determine their industry employment. For example, the 16–17 age group, looking for part-time, after-school work, is most suited for employment in the retail and service sectors. Training costs and work scheduling in industries such as manufacturing are not suitable for this group's casual labor market attachment.

The ranking of black and white groups, in terms of the cyclical versus structural issue, is more difficult than ranking age-sex groups. Although

blacks have a lower elasticity of U/P with respect to U_{PM}, it is necessary to inspect the E/P as well as the U/P equation. Of particular interest is that black youths have a considerably higher E/P sensitivity to the business cycle than whites. That is, black youths have a lower U/P but a higher E/P elasticity with respect to U_{PM}. Since blacks and whites tend to be equally employed, in percentage terms, in the high- and low-wage industries, the cyclical nature of different industries cannot be a factor.

One possible explanation is that the black youth labor market response is more closely related to fluctuations in layoffs and hirings. On the other hand, changes in the labor market status for white youths, as reflected in reentrant and new entrant rates, may be relatively more important. In any case, the ranking across races is more complex than across age and sex groups.

6.4.4 The Impact of W/MW

The relative wage term exhibits the consistent and anticipated signs in the constrained equations.[20] For all but one demographic group changes in schooling, unemployment, and the residual category are inversely related, while changes in employment are directly related to movements in W/MW. In other words, an increase in the youth market wage, *ceteris paribus*, is related to a shift into employment and out of all other activities.

Of particular interest is the relationship between unemployment (U/P) and W/MW. As previously suggested, the youth unemployment rate depends upon the cost of being unemployed. Interpreting MW as a proxy for the reservation wage, an increase in the market wage, W, leads to an increase in the cost of unemployment and hence a decrease in the unemployment rate. To the extent that W/MW represents a minimum wage variable, however, the decrease in U/P, following an increase in W/MW, would be interpreted as a demand-side effect. These two views cannot be isolated on the basis of the time series data.

The one category that shows a mixed pattern with respect to W/MW is the residual category, R. For the female equations, the three black groups and one white group are positively related, while the two white groups are negatively related to W/MW. Given the composition of R, a priori predictions of the signs of the coefficients are not obvious. One factor, however, is that the female R category contains many more homeworkers who are raising families than the male R category. The resulting sign pattern is thus compatible with a demographic overcrowding interpretation. In particular, a deterioration in W/MW may reduce completed family size and lead to an exit from R on the part of females. Since this household behavior response is not likely to be a factor in the male equations, the cost of unemployment argument should be dominant and explain the negative coefficient of W/MW.

6.4.5 The Impact of *AF/POP*

The armed forces variable plays an important role in distinguishing between the unemployment rate patterns for whites and blacks. First, this variable has had a large variance over the estimation period, rising sharply during the Vietnam War and then declining close to its prewar levels during the mid to late 1970s. Second, the black and white male groups respond differently to *AF/POP*. Unfortunately, given the data period, changes in *AF/POP*, especially its sharp increase to a peak value in the early 1970s, parallel changes in *RPy*. This may reduce the confidence that can be placed in interpreting separately these two quite different independent variables.

In the unemployment equations, the implicit coefficient of *AF/POP* was negative in each of the nine male equations. The white and black equations, however, indicate a much greater sensitivity of black unemployment to military employment. This could conceivably explain the fact that black youth unemployment has increased since 1970 relative to that of white youths. Since both the percentage of the military that is black and the percentage of blacks in the military have increased since the change to the all-volunteer forces, the decline in *AF/POP* cannot be a major factor in the black male unemployment trends.

The major differences in employment response also reflect the greater sensitivity of black labor market conditions to the level of military employment. For employment, the coefficient differences between whites and blacks are particularly large. Indeed, white employment in the 18–19 age group actually declines with increases in military employment. This is particularly surprising since *E/P* includes *M* as being employed. In other words, an increase in the military is associated with a decline in civilian employment for whites aged 18–19 that is larger than the number of whites who enter the military.

The differential white-black response pattern also holds for schooling. The increase in *AF/POP* is associated with a much larger increase in white than in black schooling. This probably reflects behavior during the draft period when increases in *AF/POP* encouraged youths to remain in or return to school to secure student deferments.

6.5 Considerations of the Deterioration of the Black Youth Labor Market

6.5.1 Unemployment and Labor Force Developments

Two basic factors suggest a deterioration in the labor market position for black relative to white youths during the 1970s. The first is that black youth unemployment increased throughout the 1970s. The second is that black youth *E/P* ratios fell over most of the past decade while white *E/P* ratios were increasing.[21]

Since increases in unemployment may be less of a problem if attributable to increases in participation rates, it is important to consider labor force and unemployment developments together. For black males, the participation rates decreased substantially for all age groups, while the rates for whites increased for all age groups. For females the situation is somewhat different. Both whites and blacks showed increasing participation rates during the period. However, the percentage growth in participation rates was much smaller for blacks than for whites for all female cohorts. In sum, these changes in unemployment and participation rates suggest a deterioration in labor market conditions for blacks, especially for black males (see table 6.8).

We have generally attributed the youth unemployment developments of the past decade to supply side factors. In the case of black males, however, the data on U/L and E/P may indicate a possibly different picture. Presumably, increases in U/L combined with decreases in L/P give at least the impression of a deterioration in demand conditions. To what extent has the demand for black males shifted adversely relative to whites and black females?

6.5.2 Trends in Secular Wages

Whereas the employment situation has worsened for blacks relative to whites, the relative wages for blacks have increased continuously during the last decade. The overall white median usual weekly earnings for full-time, wage, and salary workers increased by 6.7% per year between 1967 and 1977. However, the corresponding wage growth for blacks was 8.0% on average during the same period. The black-white wage ratios increased from 0.692 to 0.776 for males and from 0.797 to 0.936 for females during this period.

The full-time usual weekly earnings for youths whose major activities are other than school also show a similar pattern. Here again, the gap between black and white wage differentials has narrowed over time. Except for females aged 16–17, the wages of all black groups rose more than those of the comparable white groups. The black-white wage ratios increased from 0.832, 0.735, and 0.740 to 0.793, 0.799, and 0.868 for males aged 16–17, 18–19, and 20–24 groups respectively between 1967 and 1978. For females, the corresponding ratios changed from 1.125, 0.829, and 0.830 respectively to 0.914, 1.034, and 0.928. The puzzling development is that the groups with the most unfavorable unemployment-employment indicators enjoyed the best earnings growth.

6.5.3 Trends in Industry Employment

To explore further the issue of deteriorating U/L and E/P rates coupled with increasing relative wages for black youths, it is useful to explore the industry employment of black and white youths. For ease of analysis, we

Table 6.8 **Unemployment Rates and Employment/Population Ratios by Age-Race-Sex**

	Unemployment rates[a]			Employment ratios[b]		
	1965	1972	1978	1965	1972	1978
			Male			
White						
16–17	14.84	16.55	17.08	38.91	42.44	46.31
18–19	11.53	12.54	10.92	63.53	65.17	69.18
20–24	5.95	8.55	7.65	83.36	79.93	82.00
Black						
16–17	27.78	36.66	40.71	28.97	22.52	20.47
18–19	20.13	26.40	30.90	56.87	48.61	46.59
20–24	9.29	14.79	20.13	83.38	72.81	66.29
			Female			
White						
16–17	15.17	16.90	17.08	24.47	32.57	40.64
18–19	13.63	12.27	12.34	43.76	50.48	56.81
20–24	6.31	8.16	8.27	46.16	54.61	63.79
Black						
16–17	39.67	35.56	41.87	12.55	13.23	16.03
18–19	28.01	38.64	36.81	28.88	27.01	31.41
20–24	13.79	17.44	21.56	47.71	47.04	49.81

[a]The unemployment rates are defined as U/L.

[b]The employment ratios are defined as E/P where both E and P include the military.

use the percentage of each youth group which is employed in the retail and service sector compared with total employment of each demographic group. The retail and service sectors are the major employers of youths and are the lowest wage sectors. The data, presented in table 6.9, illustrate two overall developments. First, the percentage of black employment found in the lowest wage sectors is approximately equal to the percentage of white employment in these sectors. There are slightly more black males but many fewer black females (as a percentage), in comparison with white groups, in the low-wage sectors. Second, changes in the percentage of low-wage employment has worsened for black relative to white males, but improved for black relative to white females.

What is clear about these statistics is that they are not of great help in clarifying the puzzle. As a compositional issue, the improvement in black relative wages cannot be explained by the fact that their occupational status was unchanged. However, there is also no evidence of a significant deterioration in the employment status of black males that could explain their declining employment-population ratios and rising unemployment rates.

For those who believe that each age-sex-race group has its own RPy_i variable as the proper cohort overcrowding variable, there is no problem

Table 6.9 **Proportion of Each Group's Employment That Is in Low-wage Industries (Service and Retail)**

	Male			Female		
	1968	1972	1978	1968	1972	1978
White						
16–17	.7270	.7392	.7290	.8239	.8422	.8706
18–19	.4763	.5298	.5105	.5440	.6554	.6810
20–24	.3232	.3787	.3804	.5287	.5975	.6148
16–21 (out of school)	.3650	.4657	.4446	.4914	.6129	.6399
16–21 (in school)	.7765	.7833	.7929	.8881	.8967	.9051
16+	.3037	.3317	.3449	.5755	.6124	.6200
Black						
16–17	.6617	.7013	.7435	.8291	.7655	.8315
18–19	.4583	.4393	.5429	.5738	.6126	.6514
20–24	.3012	.3500	.3816	.5453	.5267	.5536
16–21 (out of school)	.3519	.4220	.4583	.5277	.5519	.6150
16–21 (in school)	.7603	.7831	.8167	.8537	.8511	.8513
16+	.3256	.3307	.3457	.6429	.6350	.6121

in explaining the declining black male employment ratios. Specifically, the ratio of black youth employment to white youth employment (where employment includes the military) has been virtually unchanged since 1965. According to the "RPy_i" model, the entire deterioration in E/P ratios for black males can thus be associated with their increasing percentage in the youth population. Since we believe that overcrowding is better defined over youths as a single group, we do not find this result a compelling explanation. Moreover, the puzzle of declining E/P ratios for black males combined with increasing relative wage rates cannot be attributed to the higher growth rate of the black youth population.

6.5.4 Trends in School Enrollment

One of the main distinctive features between white and black groups over the last decade is that the school enrollment rates for all black groups increased substantially more than those for whites. Except for females aged 20–24, the enrollment rates for whites decreased for all age-sex groups between 1965 and 1978. During the same period, the enrollment rates for blacks consistently increased. Furthermore, although the enrollment rates for all black age-sex groups were lower than those for the corresponding white groups in 1965, the situation was reversed by 1978. That is, by 1978 the enrollment rates for all black age-sex groups were higher than the comparable white groups.

Does the increase in school enrollment rates for black males equal the decline in their $E/\dot{P}$ rates? The answer can be seen by comparing tables 6.8 and 6.10. The increase in school enrollment captures almost all of the decline in E/P for black males aged 16–17. For black males aged 18–19, it picks up 4 of the 10 percentage point decline. For the black male group aged 20–24, a 17 percentage point decline in E/P is reduced to 10 percentage points when S/P is added. Perhaps as important, is that the wide gap between E/P rates for whites and blacks becomes a very narrow gap for most age-sex groups when $(E + (S \cap E))/P$ is used as an indicator of labor market position.

The nature of the problem depends upon how one evaluates schooling versus employment for youth. In level terms as of 1978, white youths enjoyed an advantage in the combined employment plus schooling ratio over comparable black youths. The trend is less obvious. The increase in white employment ratios is, in part, due to their declining school enrollment and increasing part-time work while in school. The decrease in black employment ratios is, in part, due to their increasing school enrollments. In addition, black enrollment has gained without a significant increase in after-school work (comparable to that found for white enrollees).

6.6 Summary

In this paper we have advanced the argument that the deterioration in the absolute and relative youth unemployment ratios is due primarily to a cohort overcrowding effect. Other variables that seem to play a role are the decline in the size of military service since the Vietnam War, the decline in the market wage for youths relative to some combination of minimum wages and government transfer programs, and a cyclical variable representing changes in demand. Since we control for the business cycle, which does not have a secular trend, the deterioration in the labor market position for youths over the past two decades can be attributed to labor supply factors. That is, the increasing unemployment rate of this group represents an increase in their equilibrium unemployment rate due to overcrowding and the effects of government labor market and social welfare programs.

The BLS measured unemployment rate is usually the main piece of evidence indicating the declining labor market position of youths. Although we agree that an important decline has taken place, the magnitude of the job decline is overstated by the BLS statistics. Indeed, we argue that the BLS youth unemployment rate is a very weak statistic for policy purposes. Other measures of unemployment and/or employment ratios show less decline than do the BLS measures. For example, the percentage of youths who are either employed or in school is only slightly down from the 1965 levels. We argue that this variable, or an unemploy-

Table 6.10

	Employment + School[a] / Population, 1965 and 1978	
	1965	1978
Male, white		
16–17	88.0	87.6
18–19	91.0	90.0
20–24	94.0	91.1
Male, black		
16–17	83.2	82.0
18–19	83.0	77.0
20–24	88.9	78.5
Female, white		
16–17	80.0	83.1
18–19	71.0	77.6
20–24	52.7	71.2
Female, black		
16–17	74.0	77.0
18–19	56.9	61.4
20–24	52.5	59.5

[a]The specific measure is $\frac{E+M+S-(S\cap E)}{P}$.

ment rate construct which treats schooling as equivalent in status to employment, is more useful as an indicator of the labor market position of youths with respect to jobs.

Whereas the job decline is less serious than the BLS unemployment rate indicates, the decline in the relative wage of youths may be more central to the relevant issues. That is, the labor market problem of youths is more a problem of low skill and hence low wage levels than of a lack of jobs. The increasing employment-population ratios for most youth groups, in spite of the high increase in their population, is one source of evidence of the ability of the economy to create large numbers of youth jobs.

Black males are the one sex-race youth group that combines steadily deteriorating unemployment and employment ratios. There are problems, however, in determining to what extent the overall position of this group has declined. First, the relative wage for black youths, both males and females, has improved relative to white youths. Second, the decline in employment and increase in relative wages have not been matched by a significant change in the proportion of black males in the low-wage industries. The percentage of black male employment remains approximately the same as the percentage of white male employment in the low-wage sectors. Finally, school enrollment rates have been increasing for blacks and decreasing for whites. As a result, the ratios of those employed plus those in school, as a percentage of the relevant popula-

tion, show less of a difference between black and white youths than the employment ratios alone. But, from a social welfare perspective, it is difficult to weigh the increase in joblessness against the increase in relative wages and school enrollment.

The increase in the percentage of black males who are both out of school and not employed implies that a component of the black male youth population has suffered a significant decline in their relative economic status. This suggests that for black males aged 16–24 there may be a growing divergence in labor market performance.

Notes

1. See, for example, Wachter (1972; 1976b; 1977), and Kim (1979). This work builds upon Easterlin (1968). Several relevant studies and a detailed bibliography are contained in Espenshade and Serow (1978). More recent work which develops this approach includes Ehrenberg (1979), Welch (1979), and Reubens (1979).

2. For a detailed discussion of the endogenous taste model for explaining economic-demographic variables, see Easterlin, Pollak and Wachter (forthcoming). The relative income model is presented in Easterlin (1968) and Wachter (1972; 1976b).

3. See, for example, Cain and Watts (1973).

4. The statistical problems of measuring the youth labor force is stressed by Clark and Summers (1979).

5. This model is drawn from Wachter and Wachter (1978).

6. In equations (3) and (4) it is assumed that experience or skill can be acquired only with age. The result is that the number of A workers only increases with the population and participation rates of A workers. In fact, the rate of accumulation of skill can be increased by more intensive training. The cost for training is likely to be upward sloping and steeper in the short than in the long run. Consequently, the accumulation of human capital will be slowed as workers spread their training to avoid the higher short-run costs. (This factor of increasing short-run supply costs is also a factor in the lag of actual capital behind its optimal level.)

7. An alternative measure of labor market pressure, denoted $UGAP$, yielded similar results. The U_{PM} variable was used instead of $UGAP$ because the latter contains the unemployment rate of youths. For a discussion of $UGAP$, see Wachter (1976a).

8. See, for example, Ragan (1977).

9. In this chapter, the terms blacks and nonwhites are used interchangeably.

10. An alternative variable, W/MW^*C, where C is the coverage rate, did not perform as well across equations. Especially given the lack of success of the coverage variable, our W/MW cannot be interpreted as a straight minimum wage effect. As indicated, it cannot be empirically differentiated, in most equations, from a supply-side variable that measures changes in government transfer programs.

11. For a detailed discussion of the problems with measuring government policy variables, see the original NBER discussion paper.

12. The impact of welfare programs has received relatively limited attention until recently. See Levitan et. al. (1972), Garfinkle and Orr (1974), Saks (1975), Williams (1975), Levy (1979) and the Studies in Public Welfare of the Joint Economic Committee (1973).

Major studies of minimum wage laws include Moore (1971), Kosters and Welch (1972), Goldfarb (1974), Gramlich (1976), Mincer (1976), Welch (1976), (1977), Ashenfelter and Smith (1979), and U.S. Department of Labor (1970).

For several relevant models on the impact of direct job creation see Killingsworth and Killingsworth (1978) and Palmer (1979).

13. Some of the relevant papers that provide an empirical framework for the youth unemployment problem include Kalachek (1969), Doeringer and Piore (1971), R. A. Gordon (1973), R. J. Gordon (1977), and Adams and Mangum (1978).

Recent empirical time series studies on youth unemployment which address this same phenomenon include Freeman and Medoff (1981), Ragan (1977), Thurow (1977), and the conference on Youth Unemployment (1978).

14. Conceptual problems with the definition of the unemployment rate for youths are stressed by R. A. Gordon (1973), Levitan and Taggart (1974), and Clark and Summers (1979).

15. The $\cap$ notation indicates the intersection of two variables. Hence $S \cap L$ indicates those who are in school and in the labor force.

16. The results were included in the original NBER working paper prepared for the conference.

17. Relevant studies on schooling include Freeman (1976) and the recent comment by Smith and Welch (1978). Kim (1979) investigates the complexities of the military and schooling relationship with the youth labor market. A very useful collection of essays is found in the NCMP volume (1976).

18. One of the major questions concerning the R category involves the issue of discouraged workers. The view that the number of disadvantaged potential workers in the R group is significant is stressed by Doeringer and Piore (1971) and Harrison (1972) among others.

19. For those who prefer to analyze estimated coefficients directly, the equations for the four activities, unconstrained by $\sum_{i=1}^{4} P_i = 1$ were presented in the original NBER working paper.

20. In the unconstrained equations, the pattern of the signs is unchanged, but the variable is only marginally significant.

21. Studies which focus on minority unemployment include Doeringer and Piore (1971), Harrison (1972), Wallace (1974), the Congressional Budget Office (1976), Adams and Mangum (1978), and Osterman (1978).

References

Adams, A. V. and Mangum, G. 1978. *The lingering crisis of youth unemployment*, Kalamazoo, Michigan: W. E. Upjohn Institute.

Ashenfelter, O. and Smith, R. S. April 1979. Compliance with the minimum wage law. *Journal of Political Economy*: 333–50.

Cain, G. G. and Watts, H. W. eds. 1973. *Income maintenance and labor supply*. Institute for Research on Poverty Monograph Series. Rand McNally College Publishing Company, Chicago.

Clark, K. and Summers, L. 1:1979, forthcoming. "Labor market dynamics and unemployment: A reconsideration. *Brookings Papers on Economic Activity*.

Congressional Budget Office. 1976. *The teenage unemployment problem: What are the options?* Washington, D.C.: U.S. Government Printing Office.

Doeringer, P. B., and Piore, M. 1971. *Internal labor markets and manpower analysis*. Lexington, Mass.: D. C. Heath.

Easterlin, R. A. 1968. *Population, labor force and long swings in economic growth: The american experience*. Columbia University Press for the National Bureau of Economic Research.

Easterlin, R. A., Pollak, R. A., and Wachter, M. L. 1980. Toward a more general economic model of fertility determination: Endogenous preferences and natural fertility. In *Population and economic change in less developed countries*. Chicago: The University of Chicago Press.

Ehrenberg, R. G. 1979. The demographic structure of unemployment rates and labor market transition probabilities. Paper prepared for the National Commission for Manpower Policy.

Espenshade, T. J. and Serow, W. J., eds. 1978. *The economic consequences of slowing population growth*. Academic Press. New York

Freeman, R. B. 1976. *The overeducated american*. Academic Press. New York

———. 1979. The effect of demographic factors on the age-earnings profile in the U.S. *Journal of Human Resources* 14, no. 3: 289–318.

Freeman, R. B., and Medoff, J. L. May 16–17, 1979. The youth labor market problem in the united states: An overview. Chapter 3 of the present volume.

Garfinkel, I. and Orr, L. L. July 1974. Welfare policy and the employment rate of AFDC mothers. *National Tax Journal* 27:275–84.

Goldfarb, R. S. The policy content of qualitative minimum wage research. *IRRA 27th Annual Winter Proceedings*:261–68.

Gordon, R. A. 1973. Some macroeconomic aspects of manpower policy. In L. Ulman, ed., *Manpower programs in the policy mix*. Baltimore: Johns Hopkins Press.

Gordon, R. J. 1977. Structural unemployment and the productivity of women. *Carnegie-Rochester conference series on public policy: Stabilization of the domestic and international economy*. Karl Brunner and Allan Meltzer, eds. 181–229. Amsterdam: North-Holland.

Gramlich, E. M. 1976. Impact of minimum wages on other wages, employment, and family income. *Brookings Papers on Economic Activity* 2: 409–61. Washington, D.C.: The Brookings Institution.

Harrison, B. 1972. *Education, training, and the urban ghetto*. Baltimore, Md.: Johns Hopkins University Press.

Kalachek, E. 1969. Determinants of teen age unemployment. *Journal of Human Resources* 4, no. 1:3–21.

Killingsworth, C. C. and Killingsworth, M. R. 1978. Direct effects of employment and training programs on employment and unemployment: New estimates and implications for employment policy. In *Conference report on youth unemployment: Its measurement and meaning*. Washington, D.C.: U.S. Government Printing Office.

Kim, C. 1979. Unpublished manuscript. A study of the military labor market. University of Pennsylvania.

_____. 1979. Unpublished manuscript. A study of the school enrollment rate: An empirical and theoretical investigation. University of Pennsylvania.

Kosters, M. and Welch, F. June 1972. The effects of minimum wages on the distribution of changes in aggregate employment. *American Economic Review* 62, no. 3:323–34.

Levita, S. A., Rein, M., and Marwich, D. 1972. *Work and welfare go together*. Baltimore, Md.: Johns Hopkins University Press.

Levitan, S. A. and Taggart, R. 1974. *Employment and earnings inadequacy: A new social indicator*. Baltimore, Johns Hopkins University Press.

Levy, F. 1979. The labor supply of female household heads, or AFDC work incentives don't work too well. *Journal of Human Resources* 14, no. 1:76–97.

Mincer, J. August 1976. Unemployment effects of minimum wages. *Journal of Political Economy*, part 2:S87–S104.

Moore, T. G. July/August 1971. The effect of minimum wages on teenage unemployment rates. *Journal of Political Economy* 79, no. 4:897–903.

National Commission for Manpower Policy. 1976. *From school to work: Improving the transition*. Washington, D.C.: U.S. Government Printing Office.

Osterman, P. 1978. Racial differentials in male youth unemployment. *Conference report on youth unemployment: Its measurement and meaning*. Washington, D.C.: U.S. Government Printing Office.

Palmer, J. L. 1978. *Creating jobs: Public employment programs and wage subsidies*. Washington, D.C.: The Brookings Institution.

Perry, C. R., Anderson, B. E., Rowan, R. L., and Northrup, H. R. 1975. *The impact of government manpower programs*. Philadelphia: Industrial Relations Unit, University of Pennsylvania.

Ragan, J. F. Jr. May 1977. Minimum wages and the youth labor market. *Review of Economics and Statistics* 59 no. 2:129–36.

Reubens, B. G. February 1979. *The measurement and interpretation of teenage unemployment in the United States and other countries*. U.S. Department of Labor, ASPER, NTIS PB284161/AS.

Saks, D. H. 1975. *Public assistance for mothers in urban labor market*. Princeton: Industrials Relations Section, Princeton University.

Smith, J. P. and Welch, F. November 1978. The overeducated American? A review article. *The Rand Paper Series*.

Studies in Public Welfare: Staff Studies Prepared for the Use of the Subcommittee on Fiscal Policy of the Joint Economic Committee Congress of the United States. Washington, D.C.: U.S. Government Printing Office.

Thurow, L. C. Fall 1977. Youth unemployment. New York: Rockefeller Foundation Working Paper.

U.S. Department of Labor. 1970. *Youth unemployment and minimum wages*. Bulletin 1657. Washington, D.C.: U.S. Government Printing Office.

Wachter, M. L. May 1972. A labor supply model for secondary workers. *Review of Economics and Statistics* 54, no. 2:141–51.

_____. 1:1976. The changing cyclical responsiveness of wage inflation over the postwar period. *Brookings Papers on Economic Activity*, 115–59[a].

_____. December 1976. The demographic impact on unemployment: Past experience and the outlook for the future. In *Demographic trends and full employment*. Washington, D.C.: National Commission for Manpower Policy, Special Report no. 12, 27–99[b].

_____. 2:1977. Intermediate swings in labor-force participation. *Brookings Papers on Economic Activity* 545–76.

Wachter, M. L. and Wachter, S. M. 1978. The fiscal policy dilemma: Cyclical swings dominated by supply-side constraints. In *The economic consequences of slowing population growth*. Edited by T. J. Espenshade and W. J. Serow. New York: Academic Press, Inc., 71–99.

Wallace, P. A. 1974. *Pathways to work-unemployment among black teenage females*. Lexington, Mass.: Heath Lexington Books.

Welch, F. 1977. Minimum wage legislation in the United States. In *Evaluating the labor-market effects of social programs*. Edited by O. Ashenfelter and J. Blum. Princeton: Industrial Relations Section, Princeton University.

_____. January 1979. Effects of cohort size on earnings: The baby boom babies' financial bust. *Journal of Political Economy*.87:565–97.

Williams, R. G. 1975. *Public assistance and work effort: The labor supply of low-income female heads of household*. Princeton: Industrial Relations Section, Princeton University.

Comment

Edward Kalachek

During the 1960s youth unemployment rates deteriorated relative to those of adults. The relative unemployment performance of white youths stabilized in the early 1970s but deterioration continues among blacks. Despite the importance of this phenomenon, economists have been unable to develop statistically convincing explanations. The labor market

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models that explain rather well why young persons experience high unemployment have limited power in explaining why youth rates have risen so much relative to those of adults. Wachter and Kim approach this somewhat embarrassing problem with a supply-side explanation based on two constructs, demographic or cohort overcrowding and a socially determined minimum wage. The first construct, cohort overcrowding, assumes that younger and older workers are imperfect substitutes. Given the embodiment of human and physical capital, the short-run elasticity of substitution between youths and adults is quite low. Consequently, changes in relative cohort sizes will be reflected in disproportionate changes in relative wages. To make matters worse, the material aspirations of young married workers are formed while they are still living in their parents' homes. Faced with lower than expected relative wages, young families opt for fewer children and for more market hours.

The second construct, the socially determined minimum wage, emphasizes the supply rather than the demand implications of changes in the legally required minimum. Changes in the coverage or the level of the minimum wage are not likely to occur as isolated political acts, but rather reflect a social mood that will manifest itself through the liberalization of transfer payments and of other social welfare programs. More liberal welfare programs will shift the budget line and reduce the cost of nonemployment. Furthermore, the minimum wage establishes a wage below which it is not socially acceptable to work. Increases in the minimum wage will thus alter leisure-consumption goods trade-off. Workers will no longer be willing to provide market effort at wages which hitherto were acceptable. The effect of higher reservation wages on the supply side may be as or more important than the demand-side effect.

The two constructs can now be combined to generate the time series scenario. The relative size of the youth cohort did increase substantially during the 1960s, and given that production processes adjusted slowly, relative youth earnings dropped. For many youths the market clearing wage was driven below the rising social minimum. Youth employment rose substantially but so did youth unemployment. Here Wachter and Kim develop an important and frequently overlooked point. In a comparative static analysis of workers with constant taste and perfect knowledge of this taste, individuals with market wages below the social minimum would exist and remain out of the labor force. In the real world, slight changes in tastes, mood, need, or health will lead to labor markets entry, to brief spells of employment, and to frequent reported unemployment.

This chapter would have benefited from a formally developed labor supply model. The argument that economic tastes and aspirations are molded during the period one lives with one's parents implies a forward falling labor supply curve, at least for married workers and over some range. The social minimum wage concept implies that the labor supply

schedule has been shifting inward at low relative wage levels. Between the two it is not clear whether more or less labor will be effectively supplied at lower relative wages, and the authors seem to want to have it both ways. Otherwise, this is a neat piece of political economy; that is to say, an imaginative use of economic reasoning to explain a bothersome real-world development. The authors are particularly to be commended for rescuing the social minimum wage from its subterranean existence in the informal conversations of labor economists and government officials and bringing it to the respectability of the published page. Stress on the social minimum wage is consistent with the finding reported elsewhere in this volume (chapter 2 and 7) that teenage unemployment is heavily concentrated among less than 10% of the population. It is also consistent with the experiences of those who have attempted to obtain youngsters for house or yard work. Indeed, both constructs are appealing, but difficult to demonstrate empirically. Hence it is not surprising that the empirical section provides at most rather modest support for the theory.

The paucity of appropriate data on transfer payments, job creation, and the minimum wage does inhibit empirical research. Still, it is not quite accurate to describe the time series minimum wage variable as largely a spike in 1967. Effective coverage and the relative size of the minimum both increased substantially in teenage intensive activities after 1967. Ragan[1] and others have already ably demonstrated the adverse impact of the minimum wage on teenage employment and unemployment. An analysis of Ragan's work suggests that Wachter and Kim would have obtained similarly strong findings but for their relative population variable. It is thus unfortunate that the estimating procedure does not allow a fair or reasonable test of demographic overcrowding. A current quarter correlation of relative youth population with measures of youth labor market performance is a test for instantaneous rather than for slow adjustment of production processes to cohort size. A test of a demographic overcrowding hypothesis requires a distributed lag on the relative youth population. As it is, results could be better interpreted if significance levels were shown. The strongest evidence for demographic overcrowding presented in this chapter is contained in table 6.8, which shows dramatic increases in teenage employment-population ratios between 1965 and 1972 and between 1972 and 1978. Further support is provided by the fact that a similar cohort bulge in Europe is also associated with higher youth unemployment rates.

In common with other scholars who have analyzed the youth labor market, Wachter and Kim express acute dissatisfaction with the appropriateness of the BLS concept of unemployment for this age group. They propose three supplementary measures: U_1, U_2 and U_3. U_1 is identical to the BLS measure except that military employment is included in the denominator, as well it should be. U_2 adds those school attenders who are

currently neither counted as employed or as unemployed to the denominator of U_1, since school attendance can be regarded as a work activity and is a socially acceptable alternative to paid employment for youngsters. U_3 eliminates the unemployment of school attenders from the numerator of U_2. This is the logical next step once school attendance is accepted as the equivalent of work. Since employment dominates unemployment in the BLS classification system, workers with one job who are also hunting for another are classified as employed rather than as unemployed. The array of new unemployment measures is shown in table 6.2 for 1978, though unfortunately a time series for U_1, U_2, and U_3 is not generated. For 1978 the array of measures provides a more balanced and certainly a more sanguine view than is obtained by simple reliance on the BLS measure. Indeed, if U_3 were to be accepted as the best measure, high youth unemployment would become a problem of blacks rather than a general problem.

These new unemployment measures are a useful contribution. The BLS measure is institutionally and historically based rather than being well grounded in current theory. The distinction between market and nonmarket work is far more important to the Internal Revenue Service than it is to anyone else. School attendance past age 16 is presumably a voluntary activity and the empirical evidence indicates that it is a highly productive economic activity. If we are willing to go this far, though, we must proceed still further and treat all legitimate nonmarket work as employment whether it is performed by youths or adults. The most general derivation of the U_3 measure would include in the denominator and subtract if necessary from the numerator any person engaged in significant nonmarket work. Assuming for simplicity that it is the wife who normally specializes in housekeeping and child-raising, alternative measures are required for female as well as for youth unemployment. The U_3 measure for married women, spouse and children present, will of course always be zero. Although this seems to define the problem away, it may point in the right direction. Most persons primarily engaged in important nonmarket work activity are not unemployed by reasonable or standard criteria. Rather, they wish to work more hours per year than are available, and they wish to work these hours in rather than out of the marketplace. U_3 would then be an insightful measure of labor market performance, so long as it were supplemented by an appropriate measure of the discrepancy between actual and desired hours.

Note

1. Ragan, James F. Jr., "Minimum Wages and the Youth Labor Market," *Review of Economics and Statistics*, May 1977:129–36.

Comment

Robert J. Gordon

There is much to applaud in the chapter by Wachter and Kim. Three appealing methodological features of the approach should be noted before we study the basic hypotheses and results:

1. Instead of providing us simply with regressions explaining youth unemployment, the authors study jointly four mutually exclusive youth activities: employment, unemployment, schooling, and "other." Since equations are presented as tetrads, when an exogenous variable causes an increase in youth unemployment we can look to the other three equations to find out whether the higher unemployment rate is balanced by a decline in employment, in schooling, in "other," or in all three.

2. The authors argue that for most youths, schooling and military service are alternatives to work and that the unemployment rate should correspondingly be redefined as the number of unemployed divided by the total number of youths engaged in employment, unemployment, school, and military service (adjusted to eliminate the double counting of the employed and unemployed who are also in school). Two new unemployment ratio concepts are introduced, with the same expanded denominator and a numerator composed of the conventional count of unemployed (U_2) and alternatively the unemployed not enrolled in school (U_3). The new concepts make an enormous difference, and, for instance, reduce the 1978 white unemployment rate from the 16–17 age group from the BLS figure of 17.1% to the U_3 figure of 4.8%. For blacks in that age group, the reduction is from 40.7% to 7.8%.

3. A general methodological feature of the chapter is a consistent and healthy skepticism as to whether the results are really what they seem. Is the relative share variable just picking up a time trend? Does the minimum wage variable just stand as a proxy for the influence of all government transfer programs? Can one discriminate in a meaningful way between demand and supply factors that impede relative wage flexibility? The authors fully recognize that their coefficients may be consistent with several interpretations, and their attention to potential ambiguity in their results should serve as a model for subsequent research.

The Hypotheses

The point of departure for the paper is a pair of hypotheses. First, youth and adult workers are imperfect substitutes for each other, largely because young workers have a shorter expected tenure over which employers can expect to amortize the costs of specific training. Although the underlying cause of short youth tenure is left unexplained, presumably a

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contributing factor must be experimentation with different career alternatives, as well as the freedom enjoyed by American youths (especially relative to British and European youths) in shifting at low cost back and forth between work and school.

A second component of the Wachter-Kim model is an endogenous model of the birth rate and of labor force participation. The central ingredient is a sticky reservation or aspiration income level. Thus when a temporary oversupply of young workers drives down the real hourly wage rate, the desired income level can be maintained only by an increase in hours of work, mainly through an increase in female participation achieved through a reduction in family size. Thus a generation of "baby boom" is automatically followed by a subsequent era of "baby bust." It should be noted that if the income aspiration level is completely constant, then the labor supply curve becomes a rectangular hyperbola, with shifts in the real wage generating equiproportionate changes in hours worked in the opposite direction.

The basic idea of imperfect substitution must be supplemented by additional assumptions if it is to predict a particular response of youth unemployment to an increase in the relative supply of youths following a baby boom. Since Wachter and Kim fail to provide any simple theoretical diagram to facilitate an exposition of their approach, I provide here figure C6.1, which aids in a consideration of some of the important issues. In figure C6.1 the vertical axis measures the log of the wage of youth workers relative to adults, and the horizontal axis measures the log of the number of youth workers relative to adults. The assumption of imperfect substitutability is embodied in the downward sloping relative demand curve (d). The initial situation, before the increase in relative supply, is depicted by the two left-hand upward sloping supply curves, the relative supply of youth manhours to labor force activity (n_0), and the supply of employed manhours (s_0). The horizontal distance between the two supply schedules represents the supply of "voluntary search man-hours," the outcome of the worker's rational balancing of the marginal benefits and costs of search. In the initial situation at point A, it is assumed that all unemployment is voluntary, and that the labor market is in equilibrium at the crossing point of the demand (d) and supply (s_0) schedules.

The two supply curves are drawn so that the percentage unemployment rate (for instance the ratio AB at the initial relative wage w_0) depends inversely on the wage rate. A permanent wage reduction should cause a substitution away from market work toward the joint activity of "searching and waiting."[1] Now consider the effects of an increase in the relative supply of youth labor, shown as a shift to the new pair of supply curves, s_1 and n_1, drawn to exhibit the same voluntary unemployment rate at the initial relative wage ($DE = AB$). The outcome depends on the degree of flexibility of the relative wage. If the relative wage drops from w_0 to w_1,

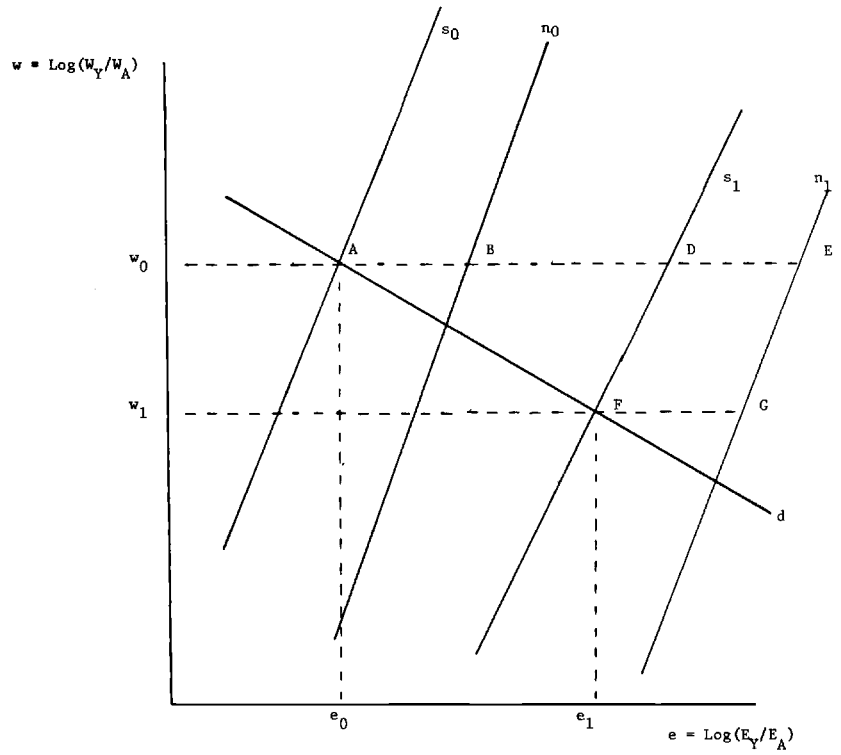

Fig. C6.1

the demand for employed manhours rises from e_0 to e_1, and the decline in the relative wage rate also induces an increase in the rate of voluntary unemployment ($FG > AB$). The opposite possibility occurs if the relative wage is absolutely rigid, as would be caused by a minimum wage with universal coverage set by the legislature as a constant fraction of the adult wage rate. The relative demand for youth manhours would remain fixed at e_0, and the relative unemployment rate would rise from AB to AE, of which BE would be involuntary.

To determine whether the model of imperfect substitution is relevant, and whether the relative wage has been flexible in response to observed changes in relative supply, I have estimated two regression equations in which the observations are sixteen age-sex groups, and the variables are the logs of the ratios of 1974 to 1956 values of the group unemployment rates (LRU_i), the group relative wage rates (LRW_i), and the group labor-force shares (LRS_i). The results show a strong positive statistical association between relative labor force shares and relative unemployment rates, and a strong negative statistical association between relative labor force shares and relative wage rates:

$$(1) \qquad LRU_i = \underset{[2.058]}{.104} + \underset{[8.129]}{.463}\, LRS_i \qquad R^2 = .412,\ SEE = .194$$

$$(2) \qquad LRW_i = \underset{[-2.721]}{-.088} - \underset{[-3.768]}{.355}\, LRS_i \qquad R^2 = .504,\ SEE = .124$$

Here the numbers in brackets are *t*-ratios. As an example, the labor force share of male youth aged 20–24 increased by 51.0% between 1956 and 1974. Equation (1) predicts an increase in the group unemployment rate by 23.6% as compared to the actual increase of 26.1%. Equation (2) predicts a decrease in the relative wage rate by 18.1% as compared to the actual decrease of 20.4% (from an actual ratio in 1956 of 71.2% of the wage paid to males 35–44 to 56.7% in 1974).[2]

The observed sensitivity of the relative wage to changes in relative supply is consistent both with the hypothesis of imperfect substitutability as well as with that of relative wage flexibility. Whether the relative wage was "perfectly" flexible or not cannot be determined from the results, since the observed increase in the relative unemployment rates of those groups in greater relative supply could have resulted either from the response of voluntary unemployment to the lower relative real wage or to involuntary unemployment caused by the incomplete adjustment of the relative wage.

The Time Series Results for Whites

While it contains no explicit estimates of the response of the relative youth wage to relative population shares, the Wachter-Kim chapter does present evidence that is broadly consistent with the simple cross-section regressions presented in equations (1) and (2). The higher population share of white youths has been associated with more unemployment, schooling, and "other" activity at the expense of less employment. By itself this conclusion does not tell us whether the increase in unemployment was voluntary or not, i.e., whether the observed higher level of unemployment corresponds to the interval *AE* or *FG* in figure C6.1. Our own evidence rules out *AE* because of the strong downward response of the relative wage evident in equation (2). And Wachter and Kim appear to rule out *FG* indirectly in their finding that unemployment has responded positively to the minimum wage, suggesting that minimum wage legislation may have interfered with the free downward movement in the relative youth wage required to clear the labor market. This minimum wage evidence is not as strong as would appear from the text of the chapter, however, because no measures of statistical significance are presented. (In the first draft of the chapter only one-third of the relative wage coefficients were both significant at the 5% level and had the anticipated sign.)

The time series results also indicate a very strong and significant effect on youth unemployment of the prime-age male unemployment rate, a proxy for aggregate demand. Thus an aggregate demand expansion can achieve a reduction in youth unemployment, yet the elasticity is below unity, implying that the demand expansion *raises* the unemployment rate of youths relative to prime-age men. This result confirms the earlier conclusion of Feldstein (1973) that high relative teenage unemployment rates cannot be reduced by expansive aggregate demand policy. Wachter and Kim also confirm Feldstein's finding that the relevant elasticities are higher for adults than for young teenagers, and for whites than for blacks. An important new result is that the black sensitivity is actually greater than that of whites but shows up in cyclical fluctuations of the employment-population ratio rather than in the conventional unemployment rate, confirming the conventional impression that blacks are victims of recessions because of their marginal job status, but that their job losses are translated into nonparticipation and "disguised unemployment" rather than fully into an increase in the official unemployment rate.

The Aspiration Hypothesis of Demographic Behavior

Much is made in the chapter of the hypothesis of an "echo effect" theory of demographic behavior, in which an oversupply of young people due to a baby boom in the previous generation creates a decline in the current generation's real wage relative to its aspiration level and an offsetting shift from child-raising to market labor force participation. Yet there is no evidence in the paper that is even relevant to the hypothesis, let alone any evidence that confirms it.

1. By and large an increase in the relative minimum wage in table 6.7 shifts young people from employment to unemployment, schooling, and the "other" category. But, as the authors recognize, this provides no evidence as to whether the response represents a conventional substitution effect on the demand side or a more indirect link between the minimum wage and the "aspiration wage" of youths.

2. The Wachter-Kim hypothesis interprets the declining birth rates and rising female labor force participation rates of the 1960s and 1970s as transitory phenomena that will be reversed when the current generation of "baby bust" children enters the labor force and finds its relative wage rising sufficiently by 1990 to send females back to the hearth to set about busily having four children apiece. An alternative hypothesis is that the recent behavior of the birth rate and female participation reflect permanent changes involving a changed perception of the social role of women. Not only do Wachter and Kim fail to provide any support for their interpretation that the recent behavior has been transitory rather than permanent, but they make no attempt to reconcile the rectangular hyper-

bolic shape of the labor supply curve required by their theory with the substantial body of evidence available that suggests a positively sloped labor supply curve for secondary workers.

3. A convincing demonstration of the cohort overcrowding theory of birthrate determination would require a much longer-term study. Even if Wachter and Kim had provided evidence on the birthrate issue, their sample period only contains one degree of freedom, the observed decline in birth rates between the 1950s and 1970s. Would their approach be able to explain the decline in birth rates between the 1920s and 1930s? My suspicion is that there was no problem of cohort overcrowding among young people at the end of the 1920s but rather the reverse because of the restrictive immigration legislation of 1924.

The Black Youth Unemployment Puzzle

Wachter and Kim leave unresolved their anomalous results for black youths that pose the paradox of improving school attainment and wage rates relative to whites, set against a deterioration in relative unemployment rates and especially in employment/population ratios. Part of the decline in the E/P ratio is, to be sure, a direct consequence of increased school attendance, but there is still a substantial problem evident in their table 6.10, which displays population shares engaged in schooling plus employment plus military service (minus the overlap involving working school enrollees). The deterioration in the black position is evident if we take the 1965–78 change in the white ratio and subtract the same change for blacks, as in table C6.1. Not only has the relative position of blacks deteriorated substantially between 1965 and 1978, but the absolute level of the ratio for the two older groups, both male and female, is between 12 and 16 percentage points lower for blacks than for whites in 1978.

The imperfect substitution framework used earlier in figure C6.1 is useful in sorting out hypotheses regarding the source of the black problem. In figure C6.2 the vertical axis is the log of the black wage rate relative to whites, and the horizontal axis is the log of black employment relative to whites. In contrast to figure C6.1, where the major event is a shift in the supply of young people relative to adults, I assume in figure C6.2 that the observed shift in the relative supply of black youths was relatively minor compared to a shift in relative demand. Starting from an initial situation at point A, with a relative wage of w_0 and relative employment of e_0, the new situation must be one with the higher relative black wage documented by Wachter and Kim. If there had been a simple shift in relative demand because of antidiscrimination legislation and the improved relative productivity of blacks resulting from their higher relative school attainment, the new situation would have occurred at point C, with a higher relative wage (w_1) and a higher employment/population ratio indicated by e_1. However, the deterioration in the black employ-

Table C6.1 1965–78 Change in Ratio of Employment + School to Population

	White	Black	Difference
Male			
16–17	−0.4	−1.2	0.8
18–19	−1.0	−6.0	5.0
20–24	−2.9	−10.4	7.5
Female			
16–17	3.1	3.0	0.1
18–19	6.6	4.5	2.1
20–24	18.5	7.0	11.5

SOURCE: Wachter and Kim, table 6.10.

ment situation, even after the adjustment for schooling, suggests that instead the labor market has moved to a point like F, with an unemployment rate of FG divided between conventionally measured and "disguised" unemployment.

The shift to point F rather than to point C is easily explained if antidiscrimination and minimum wage legislation have raised the actual relative wage paid to blacks faster than their relative productivity has increased. This is entirely consistent with the evidence provided by Wachter and Kim that "the groups with the most unfavorable unemployment-employment indicators enjoyed the best earnings growth," on the assumption that in the initial situation wage rates better reflected productivity differentials than in the new situation. The Wachter-Kim chapter contains no evidence on the relative roles of the minimum wage and antidiscrimination legislation in bringing about this compression of wage differentials, but since there was no important trend in the effective minimum wage over this period (only a sawtooth pattern), it would appear that antidiscrimination legislation may have been an important source both of the improved relative black wage and the deteriorating relative black unemployment-employment situation.[3]

Figure C6.2 is not the only possible interpretation of the black unemployment problem, because the implicit assumption that there has been an upward shift in the relative demand curve may not be valid. A new situation with a higher relative wage and lower relative employment could have been reached along the original relative demand curve (d_0), as well as along a lower demand curve, as long as there was an effective floor on the relative wage that forced blacks off of their relative supply curve. While increased education and urbanization may have improved the relative ability of blacks to compete for jobs, the ongoing shift of blue-collar jobs out of the central cities to the suburbs may have caused the net relative demand for young blacks, particularly males, to deteriorate. As one example, between 1970 and 1976 the number of jobs on Chicago's

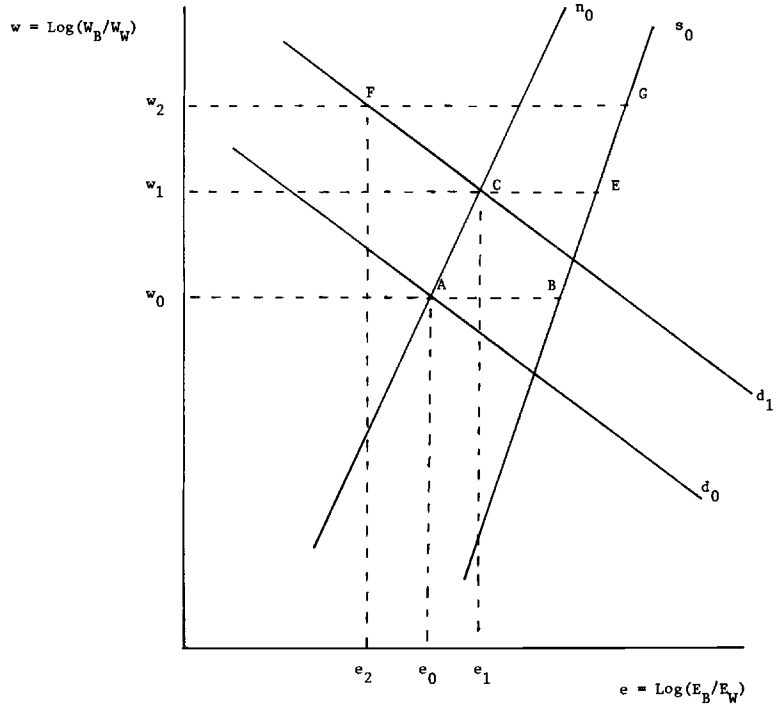

Fig. C6.2

black West Side dropped by 27.7% and by more than 10% on the South Side. In contrast, jobs in suburban northwestern Cook County increased by more than 30%, and by more than 60% in all-white suburban DuPage County. "In the 1960 and 1970 decades, most of the new jobs created in suburban Chicago were blue-collar jobs, whereas most new suburban homes were for upper-middle-class professional workers. As a result, there are now a lot more factory jobs in the suburbs than factory workers" (McManus, 1979).

At least partly as a result of this phenomenon, Chicago has the widest disparity of any major U. S. city between black and white unemployment rates (14.7% vs. 5.1% in 1976). To the extent that the problem is pervasive, if less extreme, in other cities, it would appear that the continuation of housing discrimination and segregation has aggravated the black employment problem and may have largely offset the favorable demand effects of antidiscrimination legislation in employment. The tendency of Chicago and other cities to generate new blue-collar jobs in the suburbs and new clerical jobs in the traditional central business

district may also help to explain why the employment situation has deteriorated more for black males than for females (although table C6.1 indicates a substantial relative deterioration for black females aged 20–24).

There are other important causes of the growing geographical disparity between blue-collar jobs and blue-collar homes that are evident to anyone who travels between Europe and the United States. In Paris, Milan, and Rome, new suburban factory locations are interspersed with high-rise apartment developments, many for working-class families, in contrast to the low-density middle-class subdivisions that continue to be built around U. S. cities. Among the American institutions that foster this inefficient and energy-wasting pattern of development are (1) a lack of metropolitan-wide land-use planning; (2) locally controlled restrictive zoning that keeps high-density residential developments out of the older inner suburbs; (3) the tax-deductibility of residential mortgages; (4) the Federal subsidy of interstate highways that have facilitated intrasuburban commuting; and (5) racial "steering" by local real estate agents.

Another uniquely American phenomenon is the deterioration and ultimate abandonment of vast amounts of inner-city real estate, in contrast to the continuing high density of land use within central European cities. Housing abandonment is both preceded and accompanied by the closing of commercial establishments in neighborhood shopping strips, thus eliminating a natural nearby source of employment for black youths and creating negative externalities for the remaining residents of the area. In turn, the problems of commercial flight and housing abandonment must be blamed primarily on a phenomenon which is pervasive in inner American cities but by contrast is almost unknown in most European cities: lower-class ghetto crime that simultaneously lowers the rate of return on commercial and residential investment and drives out many residents who can afford to move.

Thus at its heart the black employment problem is caused by a mixture of perverse local and Federal government policies that foster low-density middle-class suburban residential development, and the devastating impact of lower-class ghetto crime on the location of employment opportunities and on all other aspects of economic and social life in the central city. A new perspective is gained on the employment problem of U. S. blacks by contrasting their situation with that of disadvantaged lower-class workers in other countries, and the inevitable conclusion is reached that the U. S. situation is unique, has no clear counterpart in other nations, and is more accurately classified as a social rather than an economic dilemma. In its analysis of the recent geographical shift of blue-collar employment opportunities in Chicago, a recent article concluded:

These shifts probably do not directly reflect the desire of industrialists and merchants to move their establishments as far as possible from Chicago's black South and West sides. Environmental deterioration and the fear of white workers to commute to black areas are probably more important explanations than racial discrimination. But the results of the shifts are the same. Factory jobs move to the northwest suburbs, but black workers cannot follow because of racial and economic segregation in housing. [McManus, 1979]

Notes

1. See the expression for the marginal revenue from additional job search in Gordon (1973, p. 179, equation A-2). A reduction in the market wage relative to the shadow price of home time will raise marginal revenue relative to marginal cost, and thus extend the duration of job search. If this approach predicts correctly, a labor force group with an increasing share of supply should experience a higher duration of unemployment.

2. Data sources and further details are provided in Gordon (1977, pp. 199–206).

3. For an extended argument that Federal legislation prevents employers from paying blacks less to compensate for their lower productivity, see Williams (1979).

References

Feldstein, M. S. 1973. *Lowering the permanent rate of unemployment.* A Joint Committee Print of the Joint Economic Committee. Washington, D.C.: Government Printing Office.

Gordon, R. J. 1973. The welfare cost of higher unemployment." *Brookings papers on economic activity.* Volume 4, no. 1, pp. 133–95.

_____. 1977. Structural unemployment and the productivity of women." in K. Brunner and A. Meltzer, eds., *Stabilization of the domestic and international economy*, supplementary series to the *Journal of Monetary Economics.* Volume 5, pp. 181–229. North-Holland.

McManus, E. May 27, 1979. Blacks lose as jobs leave the city. *Chicago Tribune*, section 3, p. 6.

Williams, W. E. 1979. *Youth and minority unemployment.* Joint Economic Committee. Washington, D.C.: Government Printing Office.