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ABSTRACT

The purpose of this paper is to estimate the effects of enforcement of Title VII to determine whether and to what extent it has helped to achieve the elimination of employment discrimination. The model developed in this paper is considered to depart from those of previous Title VII studies in two ways. First, it incorporates the effects of the law's enforcement on nonrespondent covered firms in addition to the effects on respondent firms. Second, it analyzes separately the effects of enforcement of the law's employment and wage provisions. Primary data sources are a matched sample of covered firms, 1966-70, and the U.S. Censuses. Evidence is said to suggest that, in the aggregate, from its inception through fiscal year 1970, enforcement of Title VII at best left the economic position of black males unchanged and at worst caused it to deteriorate. While enforcement of the employment provision increased relative employment in covered firms and relative employment and wages in the economy, enforcement of the wage provision had precisely the opposite effects. The latter effects appear to have dominated the former, although the net negative impact is, in general, statistically insignificant. Two possible directions for enforcement given are: (1) concentrating limited resources on enforcement of the employment provision, and, (2) accompanying enforcement of the wage provision by strict and extensive controls on minority employment. (Author/AM)

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THE ECONOMICS OF ENFORCEMENT OF TITLE VII OF THE CIVIL RIGHTS ACT OF 1964

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UNIVERSITY OF WISCONSIN MADISON

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Andrea H. Beller

October 1975

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ABSTRACT

During the 1960s, the elimination of employment discrimination became a major social goal. Title VII of the Civil Rights Act of 1964 was designed to implement that goal. The purpose of this paper is to estimate the effects of enforcement of Title VII to determine whether and to what extent it has helped to achieve this social goal.

The model developed in this paper departs from those of previous Title VII studies in two ways. First, it incorporates the effects of the law's enforcement on nonrespondent covered firms in addition to the effects on respondent firms. Second, it analyzes separately the effects of enforcement of the law's employment and wage provisions.

Empirical testing of the model focuses on the variations across states in the relative employment of black males in covered firms and in the economy, and on the relative wages of nonwhite males in the economy. OLS and TSLS regression techniques are used to estimate the effects on these measures of overall enforcement and of enforcement of the employment and wage provisions of the law. The incidence of enforcement is measured by the number of discrimination charges filed by minorities divided by the number of employees in covered firms. The primary data sources are a matched sample of covered firms, 1966-1970, and the U.S. Censuses.

The evidence suggests that in the aggregate, from its inception through fiscal year 1970, enforcement of Title VII at best left the economic position of black males unchanged and at worst caused it to deteriorate. While enforcement of the employment provision increased relative employment in covered firms and relative employment and wages in the economy, enforcement of the wage provision had precisely the opposite effects. The latter effects appear to have dominated the former, although the net negative impact is, in general, statistically insignificant.

THE ECONOMICS OF ENFORCEMENT OF TITLE VII OF THE CIVIL RIGHTS ACT OF 1964

Introduction

During the 1960s, the elimination of employment discrimination became a major social goal. Equal Employment Opportunity (EEO) laws were designed to accomplish this goal; the primary policy tool for carrying it out has been the enforcement of these laws. Perhaps the most important among EEO laws, and certainly the one with the broadest coverage, is Title VII of the Civil Rights Act of 1964. Economists have directed their efforts towards examining the impact of these and other laws because (1) their actual effects may differ from the intended ones and (2) it is important in making policy decisions to estimate the magnitude of the effects that actually occur. The purpose of this paper is to estimate the actual effects of enforcement of Title VII to determine whether and to what extent it has helped to achieve this social goal.

Earlier studies of other EEO legislation include analyses of the impact on the minority economic position of state fair-employment laws and of federal contract compliance. Using nationwide samples, it has been found that the relative wages of nonwhite males increased more in states with fair-employment laws than in states without them (Landes, 1968); and that the employment of black relative to white males increased more in firms that held federal contracts than in firms that did not (Ashenfelter and Heckman, 1974). To date, there has been no comparable nationwide study of the impact of Title VII.

Past studies of Title VII used limited samples. They examined the effects of the law's enforcement on relative minority employment

patterns in firms (Adams, 1973) or unions (Wolkinson, 1973) that had been charged with discrimination ("respondent" firms or unions), or in firms in a specific industry in a given geographical area that had been investigated by the Equal Employment Opportunity Commission (EEOC)[1] (Kidder, 1972). In general, these studies indicated that the law had a small or negligible impact on relative minority employment. However, the researchers failed to take into account the effect of enforcement on the employment practices of nonrespondent covered firms (thereby biasing their estimates) and did not consider separately the effects of the law's various provisions. In this paper, the indirect or demonstration effects of enforcement on respondents and nonrespondents are captured in a model that aggregates over both types of firms by geographical area. The model specifies the demonstration effect as a function of the incidence of enforcement in an area: descriptively, an indicator of the law's relative presence, and technically, an approximation of the probability of apprehension for violation of the law. In addition, in this paper the effects of enforcement of the law's employment and wage provisions are analyzed separately; it is shown that they may have opposing effects on the relative economic position of minorities.

The model is developed in section I. In sections II and III, it is used to test the impact of Title VII's enforcement through fiscal year 1970 on the relative employment of black males in the covered sector (that is, covered by the law) and in the economy, and through fiscal year 1969 on the relative wages of nonwhite males in the economy. The equations estimated are adapted from the Ashenfelter-Heckman and Landes studies. The results suggest that, on the average, during the early years the actual effects of the Title VII's enforcement differed from the intended ones. Moreover, they support the model's predictions of opposing

effects of enforcement of the employment and wage provisions. A summary, conclusions, and some policy implications of the study are presented in section IV.

I. Theoretical Analysis

The theoretical framework for analyzing the effects of enforcement of Title VII on relative black employment and wages encompasses two questions:

(1) How will the firm and industry respond to enforcement of Title VII, and what implications does this behavior have for changes in relative black employment and wages in the covered sector and in the economy as a whole?[2][3]

(2) How do the enforcement activities of the EEOC affect firms' decisions on whether and to what extent to comply with the law?

Answering the first question entails an analysis of the actual costs to the firm of various types of compliance. Answering the second requires a model in which firms estimate the expected costs of violation based upon their observations of EEOC enforcement activities in their area.[4]

A. Employment and Wage Effects of Enforcement of Title VII

The majority of complaints filed under Title VII come under two provisions: the employment provision, which covers hiring, firing, discharge, and recall; and the wage provision, which covers compensation, promotion, demotion, and seniority.[5] The employment provision is designed to eliminate restrictions on the mobility of black workers into firms and occupations. The wage provision specifies that equally productive workers in a firm must receive the same wage, regardless of race. The effects on the competitive firm and industry of compliance with each provision are discussed in turn.

1. Enforcement of the employment provision. Compliance with the employment provision requires that a firm hire "qualified" blacks who seek employment at all occupational levels. If blacks and whites supplied themselves at random to firms in a given area, then compliance with this provision would occur when the black-to-white employment ratio in each occupation in a firm equaled the ratio of qualified blacks to qualified whites in the labor force of the area. In other words, compliance implies a work rule that specifies a fixed proportion of black workers to white workers, although that proportion may vary by occupation.[6,7]

Covered firms with initial black-to-white employment ratios below the fixed-proportion rule increase their demand for black workers relative to white workers. This may be shown simply in a model in which blacks and whites are perfect substitutes in production and in which black and white wages are given to the firm.[8] It has been shown that where blacks and whites are treated as perfect substitutes, discrimination results in segregated firms or segregated occupations within firms.[9] In a given firm, occupations may be segregated black, segregated white, or integrated. Strictly speaking, enforcement of the employment provision affects only the latter two.

Assume that the firm has a production function with two types of labor, L_1 and L_2:

$$X = f(L_1^*, L_2^*) = G[g(L_1), h(L_2)]. \qquad (1.1)$$

The firm produces both types of labor services with black labor, B, and white labor, W, which are perfect substitutes. Hence, $L_1 = B_1 + W_1$ and $L_2 = B_2 + W_2$. In panels I and II of Figure 1, AB_1^* and W_2^*D are isoquants for the production of the two types of services respectively. For type L_1 services, the firm faces a net wage ratio equal to $(w_{1B} + d_{1B})/w_{1W}$ and for type L_2, $(w_{2B} + d_{2B})/w_{2W}$, where d_{1B} and d_{2B} are the monetary

equivalents of the firm's tastes for discrimination against B_1 and B_2 respectively. CB_1^* and W_2^*E in panels I and II are the least-cost lines given by these net wage ratios.[10] At the initial equilibrium, M, shown in panel III, the firm hires B_1^* in L_1, W_2^* in L_2, and the net wage ratio for the production function is equal to $(w_{1B} + d_{1B})/w_{2W}$, shown by the slope of FG.

Enforcement of the employment provision affects the L_2 labor service. If the fixed-proportion work rule is given by the slope of the ray OH from the origin as in panel II, the equilibrium point shifts from a corner on the W_2 axis to a point such as J on the ray OH. The net wage of L_2 labor becomes a weighted average of the net black wage and the white wage in L_2; the weights are the proportions of L_2 jobs held by blacks and by whites. The net wage ratio for the production function equals

$$(w_{1B} + d_{1B}) \Big/ \left[\frac{B_2'}{L_2'} (w_{2B} + d_{2B}) + \frac{W_2'}{L_2'} w_{2W} \right] .$$

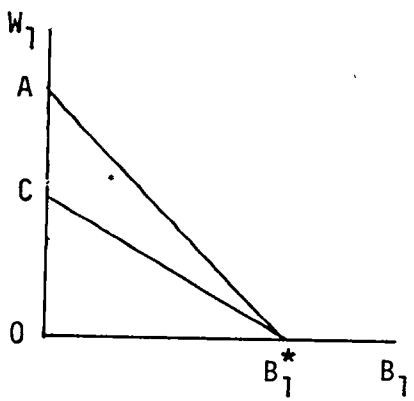
It has been assumed that $(w_{2B} + d_{2B}) > w_{2W}$. Hence, L_2 labor becomes relatively more costly; the slope of the least-cost line in panel III is reduced, and the firm substitutes L_1 for L_2, as shown by the new equilibrium point N.[11] This substitution towards the segregated black occupation implies that the covered firm that chooses to comply with the law increases its employment of blacks by even more than is required to attain the specified B/W ratio in the segregated white occupation.

This analysis is easily extended to cover the case in which both occupations are segregated white. Where occupations are integrated, the firm will hire at least the specified ratio of black workers to white workers and no other changes will occur.

Figure 1

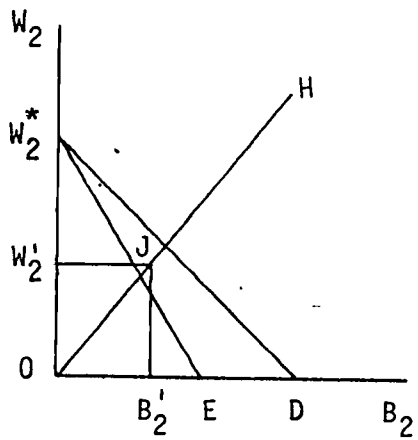
I. L_1

$$\left[\frac{w_{1B} + d_{1B}}{w_{1W}}\right] < 1$$

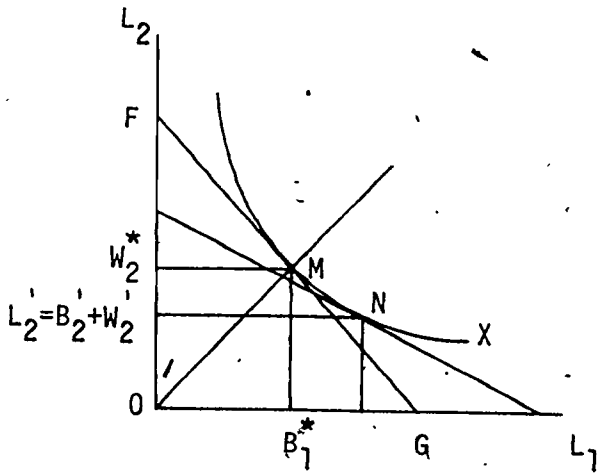


II. L_2

$$\left[\frac{w_{2B} + d_{2B}}{w_{2W}}\right] > 1$$



III. Production Function



The implication of this analysis is that a firm that chooses to comply with the employment provision increases its demand for black workers relative to white workers. In order to determine whether black employment increases or decreases and what happens to white and total employment, it is necessary to specify the firm's underlying utility function. One commonly used specification makes utility a function of profits (π) and the number of blacks employed (B):

$$u = u(\pi, B) \qquad \text{with } u_1 > 0 \text{ and } u_2 < 0 \tag{1.2}$$

and

$$\pi = P_o f(B + W) - w_W W - w_B B, \tag{1.3}$$

where P_o is the price of output and f is the production function with $f' > 0$ and $f'' < 0$. It is shown in Appendix A that a government-enforced employment ratio causes the firm to (1) increase the number of blacks employed, (2) decrease the number of whites employed, and (3) decrease the total employment of the firm.

According to this model, industry supply will decline and product price will rise. Unless the demand for the industry's output is perfectly inelastic, the scale of the industry is reduced. If many firms in the covered sector have similar utility functions, an excess supply of white labor is created in that sector, which cannot be absorbed due to the scale reduction. Unemployed whites move into the uncovered sector, increasing the relative supply of whites and the black-to-white wage ratio in that sector.

While it is unclear what reduction in utility will cause a firm to go out of business, it is obvious that it can regain a higher level of utility by moving into an area where blacks are a smaller proportion of the labor force, assuming for the moment that moving is costless. Should enforcement occur in such an area, the firm's utility will be reduced

by a smaller amount; the government-enforced proportion will be at a lower B/W ratio at the new location than it was at the initial location. The movement of firms into areas with lower black populations reduces the covered-sector demand for blacks and for blacks relative to whites, provided that blacks are relatively less mobile than firms.[12]

If the increase in relative demand in firms that stay in business at the same location exceeds the reduction brought about by the relocation of firms, then enforcement of the employment provision will increase the relative employment and wages of blacks in the covered sector and in the economy as a whole. Alternatively, if the reduction in relative demand exceeds the increase, relative employment and wages will fall.[13]

In summary, enforcement of the employment provision of Title VII will have a positive effect upon relative black employment in covered firms that remain in business at the same location, and a positive or negative effect upon relative black employment and wages overall.

2. Enforcement of the wage provision. Compliance with the wage provision requires the firm that hires both blacks and whites to pay them equal wages for the same work and give them equal opportunities for promotion to higher-paying jobs. If blacks are paid less than whites, then enforcement requires the firm to increase w_B, which raises relative wages.

For the case in which blacks and whites are treated as perfect substitutes in production,[14] it is only the integrated firm that is affected by enforcement of the wage provision. An increase in w_B/w_W causes such a firm to move to a corner on the W axis, as in the initial position shown in panel II of Figure 1; ignoring hiring costs, the firm becomes segregated white. The quantity of black workers relative to

white workers demanded is reduced, and relative black employment falls (in this case to zero).

The long-run supply price of the perfectly competitive industry must increase and its output must be reduced when the price of a factor increases. The reduction in industry output may be accomplished by a reduction in the output of the individual firm or by the exit of firms from the industry.[15] The reduction in the size of the covered sector leads to a decrease in the demand for all factors of production and to excess supply in that sector. As blacks and whites move into the uncovered sector, their wages will fall absolutely, but the relative wage in that sector may rise or fall.[16] The effect of enforcement of the wage provision on the average relative wage in the covered sector is also ambiguous. Firms can reduce the costs of compliance by moving into areas in which there are fewer blacks in the labor force. The resulting reduction in the demand for blacks relative to whites in the covered sector puts a downward pressure on relative wages. On the other hand, relative wages are increased in those covered firms that comply with the wage provision.

Some of the blacks who become unemployed in the covered sector may search for the higher-wage jobs in that sector rather than accept employment in the uncovered sector. In addition, if the expected wage (the actual wage times the probability of having a job) in the covered sector is greater than the wage in the uncovered sector, blacks employed in the uncovered sector will move to the covered sector to search for these jobs.[17] The incentive for blacks to increase the time spent in job search will reduce relative black employment in the economy as a whole.

In summary, enforcement of the wage provision will increase relative wages in those covered firms that comply with the provision, while it may reduce or increase them in the covered sector as a whole and in the uncovered sector. Therefore, the average wage effect for the entire economy may be positive or negative. The average employment effect of enforcement of the wage provision will tend to be negative. There are two factors working in this direction--the reduction in relative employment in the covered sector and the tendency for blacks to increase the time spent in job search.

Whether and in what way a firm chooses to comply with the law will depend on the firm's perceptions of the relative probabilities of being apprehended for violating each provision. The formation of these perceptions and the mechanism by which they influence behavior will be discussed in the next section.

B. The Direct and Indirect Effects of Enforcement

This analysis departs from previous studies of Title VII in its attempt to incorporate both the direct and the indirect or demonstration effects of enforcement of Title VII on firms in the covered sector. The direct effects of the law are changes in the employment practices of firms that result from specific charges of discrimination. The demonstration effects are modifications in the employment practices of covered firms including nonrespondents, which, aware of enforcement activities, seek to avoid being charged with discrimination.[18]

All firms that engage in discriminatory employment practices face a set of costs, the expected costs of violation of Title VII. These costs are a function of the actual costs of violating the law if the

firm is caught times the probability of being caught.[19] The probability of apprehension, p, depends upon the level and type of violations in which the firm engages, and can be affected by changes in its employment practices. Although these p's are unknown a priori, the individual firm can use information available to it to estimate them.

It is assumed that the firm has knowledge of the incidence of proximate firms that are caught in the different violations, that is, firms against which enforcement takes place.[20] Then, the firm's perceived probability of apprehension for each type of violation may be specified as a positive function of the incidence of proximate firms that are caught with similar violations. Given the monetary value to the firm of discrimination, the firm's risk preferences, the actual costs of compliance, and the actual costs associated with each level of violation, the higher the firm's perceived probability of apprehension, the higher the expected costs of violation, and the greater the likelihood that the firm will seek to comply with the provisions of the law.[21]

The aggregate behavioral response to enforcement depends upon three factors: (1) the expected cost functions of all firms, (2) the incidence of firms that are caught, and (3) the number of firms aware of any given enforcement activity. The perceived probability of apprehension, and therefore (1), was specified as a positive function of (2) for each firm. Further, (3) is postulated to be a positive function of (2), that is, the number of firms aware of any given enforcement activity is postulated to increase with increases in the incidence of enforcement.

The total enforcement effect on relative employment or relative wages is the sum of the direct enforcement effects (the behavioral responses of firms that are caught), and the demonstration effects (the behavioral

responses of those firms that are aware of enforcement activities). From the reasoning in the previous section, the direct and demonstration effects may be positive or negative.

The change in the total enforcement effect resulting from an increase in the incidence of enforcement is equal to the average enforcement effect in respondent firms plus (the number of firms affected indirectly times the change in the indirect enforcement effect due to an increase in the perceived probability of apprehension) plus (the average indirect enforcement effect times the increase in the number of firms affected indirectly due to the increase in enforcement). (It should be noted that the average direct enforcement effect is unobservable because respondent firms may also be affected indirectly.)[22]

An implication of this analysis is that if the direct and demonstration effects of enforcement have the same sign, the total enforcement effect on relative employment or wages will increase (or decrease) with increases in the incidence of enforcement. This hypothesis will be tested in a cross-sectional analysis in which proximity is defined geographically by state.[23]

II. Empirical Analysis: Relative Employment

The effect of enforcement of Title VII on the employment of black relative to white males may be estimated for covered firms and for the economy as a whole. Matched 1966 and 1970 employment records of a sample of covered firms that were in business at the same location in both years, aggregated by state, are used to estimate the enforcement effects on covered firms. The matched sample is well suited for this

purpose because it allows a test of one of the two unambiguous predictions of the theoretical model: the positive effect of enforcement of the employment provision on relative employment in firms that did not move. (The unavailability of data precludes estimation of the other unambiguous prediction of the model: the positive effect of enforcement of the wage provision on relative wages in these firms.)[24] The effects on relative employment in each of the nine broad census occupational categories and on total relative employment are estimated.[25] Census data for 1950, 1960, and 1970 are used to estimate enforcement effects on total relative employment in the economy as a whole. The mobility effects of enforcement on covered firms are captured in this phase of the empirical analysis.

The estimating equation is formulated to incorporate the idea that the attempt to bring the actual level of relative black employment to its desired level is only partially successful in any one period.[26] The adjustment process may be written as

$$\left(\frac{RBE_t}{RBE_{t-1}}\right) = \left(\frac{RBE_t^*}{RBE_{t-1}}\right)^{\lambda} \qquad (2.1)$$

where RBE is the level of relative black employment, by occupation and total, in time periods t and t-1, RBE^* is the long-run level of RBE, and λ is the adjustment coefficient. This process may be rewritten as

$$\ln RBE_t - \ln RBE_{t-1} = \lambda \ln RBE_t^* - \lambda \ln RBE_{t-1}. \qquad (2.2)$$

The natural logarithm of the long-run target level may be expressed as

$$\ln RBE_t^* = \alpha + \beta \ln X + \gamma \ln CHG + \delta(\ln CHG)^2 \qquad (2.3)$$

where X is a common set of variables assumed to determine all employment ratios and CHG is a measure of the incidence of enforcement. In determining their target employment ratios, firms are assumed to take the

costs of violation of Title VII into consideration. The quadratic formulation implies that the elasticity of RBE^* with respect to CHG depends on the level of CHG. Using (2.3), (2.2) may be rewritten as

$$\ln RBE_t - \ln RBE_{t-1} = \lambda\alpha + \lambda\beta \ln X + \lambda\gamma \ln CHG + \lambda\delta(\ln CHG)^2 - \lambda \ln RBE_{t-1} + u_t \quad (2.4)$$

where u_t is a disturbance term with the classical properties. The coefficients of lnCHG and $(\ln CHG)^2$ provide an estimate of the short-run adjustment elasticity of relative employment with respect to enforcement. Finally, the equations are estimated using the following equivalent formulation:

$$\ln RBE_t = \lambda\alpha + \lambda\beta \ln X + \lambda\gamma \ln CHG + \lambda\delta(\ln CHG)^2 + (1-\lambda)\ln RBE_{t-1} + u_t \quad (2.5)$$

The X vector includes such economic and demographic factors as the level of and change in the relative supply of blacks, the level of and change in total employment in each state, the relative educational level of black males, labor market variables, and location in an SMSA or in the South. It also includes variables representing other equal employment opportunity laws in effect during the period: federal contract compliance and state fair-employment laws. Executive Order 11246 prohibits discrimination in employment by federal contractors; state fair-employment laws make employment discrimination illegal in some states. These laws are expected to increase the demand for black relative to white males and therefore to have a positive effect on relative black employment.

In the theoretical analysis of the previous section, the effect of enforcement was hypothesized to be a function of the incidence of enforcement. The empirical counterpart used in this paper is the number of discrimination charges (C) filed with and accepted as under their

jurisdiction by the EEOC[27, 28] divided by the number of employees in covered firms (N).[29, 30] The mean and standard deviation of C are 454.4 and 596.9; those of C/N are .00064 and .00080. The measure C/N is equal to the actual probability of apprehension times the incidence of discrimination: C/N = C/D X D/N, where D is a measure of the number of violators of the law. Since there exists no independent measure of D, C/N is used as an estimate of the incidence of enforcement; the relative variation in C/N will approximate the relative variation in C/D to the extent that systematic variations across states in the incidence of discrimination are controlled for. Part of the variation across states in the incidence is reflected in the traditional demographic factors included in the X vector of equation (2.5). In addition, the initial level of relative black employment (RBE_{t-1}) reflects cumulative market phenomena including discrimination; it is assumed that the variation across states in the incidence of discrimination is approximated by the variation in RBE_{t-1}.[31]

A value for each of the variables is assigned to each state. The variables are defined and their sources stated in Table 1.[32]

A. The Effect of Enforcement on Covered Employment

Tables 2 and 3 present ordinary least squares (OLS) estimates of the coefficients on enforcement variables from log-linear weighted regression equations[33] on the change in relative black male employment in covered firms between 1966 and 1970, total and by occupation. (Because of the possibility of simultaniety between the dependent variable, the change in the economic position of black males, and the enforcement variables, a simultaneous equations model, in which enforcement is treated as endogenous, was also estimated. The

two-stage least squares (TSLS) estimates, which do not differ significantly from the OLS estimates presented below, can be found in Beller, 1974, appendix B.[34]) Table 2 contains coefficients on the overall incidence of enforcement of Title VII; Table 3, on the incidence of enforcement of the employment and wage provisions. These coefficients are estimates of the short-run adjustment elasticities of relative employment with respect to the incidence of enforcement. (The complete equation for total relative employment is presented with discussion in Appendix B. Space limitations preclude presentation of the equations for each occupation; the interested reader is referred to Beller, 1974, pp. 91-95 and 123-137.).

The incidence of enforcement is specified in linear and quadratic forms; the appropriate form is not made explicit by the theoretical analysis. Lines 1 and 2 of Table 2 contain the coefficients and t-statistics on the overall incidence of enforcement with both a linear and a quadratic term entered in each occupational equation. Lines 3 and 4 present the number of degrees of freedom for these equations[35] and the F-test for joint significance. Lines 5 and 6 contain the coefficients and t-statistics on a linear or a quadratic term entered alone; the coefficient is presented only if it is as significant as or more significant than the comparable coefficient from the joint specification. In Table 3, lines 1 and 2 contain linear and/or quadratic terms on the incidence of enforcement of the employment provision, and lines 3 and 4 contain linear and/or quadratic terms on the incidence of enforcement of the wage provision. The specification presented for each occupation--including at least one employment provision variable and one wage provision variable--is that for which the joint significance level, indicated by the F-statistic (lines 5 and 6), is highest.[36]

TABLE 1

List of Variables Used in Employment Analysis

Variable Name	Definition
RBE70, RBE66 & RBETL	The ratio of black to white male employment in each occupation in 1970 and 1966 in the covered sector and the ratio of black to white male total employment in 1970 and 1960 in the entire state. The occupations are officials and managers, professionals, technical, sales, office and clerical, craftsmen, operatives, laborers, service workers, and total.
EMPL	Total employment in 1970 in (1) the covered sector or (2) the entire state.
CEMPL	Change in EMPL in (1) the covered sector between 1966 and 1970 or (2) the entire state between 1960 and 1970.
PPB	Proportion of the population that is black in 1970. Data are from the 1970 Census.
CPPB	Change in PPB between 1960 and 1970. Data are from the 1960 and 1970 Censuses.
GMR	Gross migration rate of blacks between 1965 and 1970. Data are from the 1970 Census.
RED	The ratio of the mean years of school completed of black to white males, 25 and over, in 1970. Included in the equations for the white-collar occupations only. Data are from the 1970 Census.
UNEMPL	Unemployment rate of all males, 16 and over, in 1970. Data are from the 1970 Census.
CUNEMPL	Change in the annual average unemployment rate between (1) 1965 and 1969 or (2) 1960 and 1969. Data are from the Manpower Report of the President 1973.
PFC	Proportion of employment in the matched sample in firms with federal contracts.
CHG1, EMCHC1, and WACHG1	The total number of charges of discrimination filed by minority males and females during fiscal years 1968-1970 divided by the number of employees in firms with 20 or more employees in 1969. The prefix EM is used to represent charges which include violation of the employment provision as an issue and WA, violation of the wage provision. The total number of issues is greater than the total number of charges because a charge is often filed for more than one

TABLE 1--Continued

Variable Name	Definition
CHG1 (continued)	issue. Charges data are from the Division of Systems and Control of the EEOC and data on the number of employees are from County Business Patterns 1969, part 1.
FEPC64	Dummy variable assigned a value of one for states with Fair Employment Practices commissions established prior to 1964 and zero elsewhere.
UNION	Union membership as a proportion of total employment in nonagricultural establishments in 1970. Data are from the Directory of National Unions and Employee Associations 1971.
SMSA	Proportion of employment in an SMSA in (1) the covered sector or (2) the entire state.
SOUTH	Dummy variable assigned a value of one for all southern states and zero for nonsouthern states.
MFG	Proportion of employment in manufacturing firms in (1) the covered sector or (2) the entire state.
PEMCOV	The number of employees in Social Security reporting units with 20 or more employees divided by the total number of employees in all reporting units. This variable is included in the regressions for the entire economy only and is used as a proxy for the proportion of employment in the covered sector. Data are from County Business Patterns, 1969, part 1.

Note: Unless otherwise stated, data for the covered-sector regressions are taken from the matched sample tapes and data for the entire economy regressions are taken from the 1960 and 1970 Censuses.

TABLE 2

Coefficients and Significance of Incidence of Enforcement Variables from Log-Linear Regression Equations on the Change in Relative Black Employment from 1966-1970 by Occupation and Total for Covered Firms in the United States

	Occupation				
	Officials and Managers	Professional	Technical	Sales	Office and Clerical
1... lnCHG1	.3694 (1.18)	.0028 (0.01)	.0250 (0.09)	-.0563 (0.10)	.2804 (0.91)
2... $lnCHG1^2$	.0196 (1.04)	.0088 (0.41)	.0038 (0.23)	-.0122 (0.38)	.0210 (1.15)
3... Degrees of freedom	22	26	25	23	26
4... F-test	F(2,22)=1.38	F(2,26)=5.09**	F(2,25)=0.54	F(2,25)=2.95*	F(2,26)=2.29
5... lnCHG1	.0470 (1.34)	-.1442 (3.27)***	-.0377 (1.13)	.1446 (2.47)**	-.0701 (1.78)*
or 6... $lnCHG1^2$	....	....	....	....	....

	Craftsmen	Operatives	Laborers	Service Workers	Total
1... lnCHG1	.5070 (1.41)	.3528 (1.39)	.1410 (0.65)	-.0803 (0.29)	.3274 (2.05)**
2... $lnCHG1^2$	.0299 (1.37)	.0213 (1.41)	.0081 (0.63)	-.0058 (0.35)	.0205 (2.16)**
3... Degrees of freedom	27	29	29	28	29
4... F-test	F(2,27)=0.96	F(2,29)=1.01	F(2,29)=0.24	F(2,28)=0.16	F(2,29)=2.32
5... lnCHG1	....	....	....	....	....
or 6... $lnCHG1^2$	....	....	....	-.0010 (0.49)	....

Source: See Table 1 and Beller (1974, appendix A).

Note: All relative employment regressions include the District of Columbia and exclude Alaska, Hawaii, North Dakota, and Montana. Some other states are excluded from equations in which the enforcement measure equaled zero, since the variables are in logs. t-statistics are in parentheses.

*,**,***Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

TABLE 3

Coefficients and Significance of Incidence of Enforcement Variables by Issue from Log-Linear Regression Equations on the Change in Relative Black Employment from 1966-1970 by Occupation and Total for Covered Firms in the United States

	Officials and Managers	Professionals	Technical	Sales	Office and Clerical
1... lnEMCHG1	.1366 (2.20)**	...	-.0366 (0.49)	-.0052 (0.04)	.1565 (2.81)***
2... $lnEMCHG1^2$	...	.0011 (0.23)	...	...	...
3... lnWACHG1	...	...	.1570 (0.51)	.1295 (1.14)	-.2041 (3.92)***
4... $lnWACHG1^2$	.0046 (1.52)	.0054 (1.27)	.0076 (0.53)	...	...
5... Degrees of freedom	22	24	22	23	25
6... F-test	F(2,22)=2.50*	F(2,24)=4.75***	F(3,22)=0.33	F(2,23)=3.30*	F(2,25)=8.89***

	Craftsmen	Operatives	Laborers	Service Workers	Total
1... lnEMCHG1	1.273 (2.43)**	.0516 (0.90)	-.4711 (1.43)	-.2334 (0.73)	.0049 (0.13)
2... $lnEMCHG1^2$	.0728 (2.48)**	...	-.0259 (1.48)	-.0142 (0.77)	...
3... lnWACHG1	-.6881 (1.58)	...	.6847 (2.46)**	-.0073 (0.11)	.1891 (1.22)
4... $lnWACHG1^2$	-.0375 (1.73)*	.0018 (0.63)	.0342 (2.46)**	...	.0101 (1.35)
5... Degrees of freedom	24	26	24	25	25
6... F-test	F(4,24)=1.70	F(2,26)=0.33	F(4,24)=1.77	F(3,25)=0.24	f(3,25)=0.83

Source: Table 1 and Beller (1974, appendix A).

*,**,***Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

Perhaps the first question that should be answered is whether enforcement of Title VII had any effect on relative black employment in the covered sector during its initial period of enforcement, 1966-1970. The last column in the lower panel of Table 2 shows the estimated coefficients of enforcement on the change in total relative black employment. The question is answered in the affirmative; the estimated coefficients are individually significant at the 5 percent level and approach joint significance at the 10 percent level. What is perhaps unexpected is that the curve showing the adjustment of relative employment as a function of the incidence of enforcement is U-shaped. An increase in enforcement reduces relative employment at low levels of enforcement and increases it at higher levels. The change occurs at 0.14 standard deviations from the unweighted mean of lnCHG1, well within the range of observable data.

The estimated relationship suggests that, ceteris paribus, states with a high incidence of enforcement have smaller changes in relative employment than states with the lowest incidence of enforcement. However, a 95 percent confidence belt around the estimated relationship includes values that imply slightly larger relative employment changes in high-enforcement states.[38] In order to determine the magnitude of the enforcement effect, the difference between the level of relative employment in 1970 at the lowest observed point and that at the mean incidence of enforcement was calculated. Increasing enforcement to the mean reduces relative employment by 25 percent.

The curves showing the adjustment of relative black employment in the blue-collar occupations (except service workers) as a function of the incidence of enforcement are also U-shaped, but the estimated coefficients are insignificant. The adjustment elasticities are negative for the

professional and office and clerical occupations and positive for the sales occupation. According to the estimates, doubling the incidence of enforcement reduces relative employment in the professional occupation by 14 percent and in the office and clerical occupation by 7 percent, while it causes an increase of 14 percent in the sales occupation.

Enforcement of the employment provision and enforcement of the wage provision of Title VII are generally seen to have opposing effects on relative black employment (see Table 3), effects that underlie the overall enforcement effect shown in Table 2. It was hypothesized that enforcement of the employment provision would have a positive effect and enforcement of the wage position a negative effect on relative employment in covered firms. For those occupations in which the separate effects are significant, they are in the hypothesized direction. For example, the significant positive effect of the employment provision and the insignificant negative effect of the wage provision underlie the overall insignificant positive relationship between incidence of enforcement and relative employment of officials and managers. The wage provision has a strong negative effect on relative black employment in the office and clerical occupation, which dominates the weaker positive effect of the employment provision.[39]

B. The Effect of Enforcement on Employment in the Economy

The theoretical analysis resulted in ambiguous predictions about the direction of the enforcement effects on relative black employment in the economy as a whole. These effects are estimated using the equation previously described with the variables defined as in Table 1. Changes in total relative black employment from 1960-1970 and 1950-1960

and the ratio of the 1960-1970 to the 1950-1960 change are estimated. The 1950 data are from the U.S. Census. (The independent variables in the latter equation are specified in ratio form except for the dummy and enforcement variables and except for the proportion of employment in firms with federal contracts, PFC, which enter as in the 1960-1970 equation.) One additional variable, PEMCOV, a proxy for the proportion of employment in firms covered by Title VII, has been added to these regressions. Its coefficient may be interpreted as the partial effect of the degree of coverage of the law holding constant the incidence of enforcement. Table 4 presents OLS estimates of the coefficients on PEMCOV and on the enforcement variables from these equations.[40] (The complete equations with the enforcement variable defined differently may be found in Beller, 1974, appendix B. The coefficients on the independent variables in the 1960-1970 equation do not differ significantly from those in the 1966-1970 equation for total covered employment, which are presented in Appendix B.)

According to the estimates in the first column of Table 4, the short-run adjustment elasticity of relative black employment in the economy with respect to the overall incidence of enforcement is negative but is not significantly different from zero. On the other hand, enforcement of the employment and wage provisions has significant effects on relative employment; the adjustment elasticity has an inverted U-shape with respect to the employment provision and a U-shape with respect to the wage provision. All of the coefficients are individually and jointly significant at the 5 percent level. A significant positive elasticity of relative employment with respect to the size of the covered sector (PEMCOV) is observed.

TABLE 4

Coefficients and Significance of Incidence of Enforcement Variables from Log-Linear Regression Equations on the Change in Total Relative Black Employment from 1960-1970 and 1950-1960, and on the Ratio of These Changes, for the United States

	Estimated Coefficients and t-statistics					
	1960-1970		1950-1960		Ratio of Changes	
	(1)	(2)	(3)	(4)	(5)	(6)
PEMCOV	1.108 (1.81)*	1.253 (2.87)***	1.144 (2.37)**	1.116 (2.40)**	.052 (0.14)	.321 (1.15)
lnCHG1	...	...	...	...	-.028 (1.67)	...
$lnCHG1^2$	.0013† (0.93)	...	-.0002 (0.22)	...	...	...
lnEMCHG1	...	-.446 (2.39)**	....	-.035 (1.13)	...	...
$lnEMCHG1^2$	...	-.026 (2.45)**	...	...	...	-.002 (1.14)
lnWACHG1	...	.352 (2.38)**	...	.044 (1.31)	...	...
$lnWACHG1^2$	...	.020 (2.69)**	...	...	...	.003 (2.16)**
Degrees of freedom	28	22	30	26	29	25
F-test for charges	...	F(4,22)= 3.45**	...	F(2,30)= 0.93	...	F(2,25)= 3.20*

Source: See Table 1 and Beller (1974, appendix A). The data for the 1950-1960 equations are taken from the 1950 and 1960 Censuses.

Note: Since the incidence of enforcement is always a fraction, the entire relationship falls in a negative quadrant.

*,**,***Significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

†The square of the logarithm of the incidence of enforcement is inversely related to the logarithm; hence, this coefficient implies a negative effect of enforcement on the dependent variable.

Moreover, the enforcement variables are unrelated to the change in relative employment during the pre-enforcement decade, 1950-1960 (columns 3 and 4). These results are taken as evidence that there were no systematic differences among the states in the dependent variable correlated with subsequent variations in enforcement activities. This evidence lends support to the interpretation of the coefficients on the enforcement variables from the 1960-1970 cross-section equations. On the other hand, the estimated coefficients on the coverage variable are positive and significant in both cross-sections and do not differ significantly between them. Thus, the effect of PEMCOV on relative employment appears to be independent of its status as a proxy for the degree of coverage of Title VII; it is, by definition, an estimate of the proportion of employment in middle- and large-sized firms.

Direct estimates of the effects of enforcement are derived from equations on the ratio of the 1960-1970 change in relative black employment to the 1950-1960 change (columns 5 and 6). The estimates suggest that a portion of the differential change in relative employment between the two decades is explained by enforcement. Overall, enforcement reduced the 1960-1970 change relative to the 1950-1960 change; the estimated coefficient approaches significance at the 10 percent level (column 5). Enforcement of the employment provision had an insignificant positive effect and enforcement of the wage provision a significant negative effect on the differential change between the decades. These variables are jointly significant at the 10 percent level (column 6).

In summary, it has been found that enforcement of Title VII had effects on total relative black employment in the economy (Table 4) that are similar to those found on relative employment in the covered

sector (Tables 2 and 3). The adjustment elasticity of relative employment with respect to enforcement is negative overall. The elasticity is positive with respect to the employment provision and negative with respect to the wage provision; the estimated elasticities are jointly significant for total employment in the economy and for some occupations in the covered sector. Within the context of the theoretical framework, these results imply that (1) enforcement of the employment provision reduces relative black employment in firms that relocate by a smaller amount than it increases relative black employment in firms that comply, and (2) enforcement of the wage provision reduces relative black employment in the covered sector by a larger amount than is absorbed in the uncovered sector.

III. Empirical Analysis: Relative Wages

In this section, the effects of enforcement of Title VII on the relative wages of nonwhite males in the economy are estimated using data from the U.S. Census.[41] In the theoretical analysis, the direction of the effects is ambiguous. It is found that enforcement of the employment provision increased the percentage change in relative wages between 1959 and 1969 and that enforcement of the wage provision decreased the change. Overall, enforcement had a negative but insignificant effect on the percentage change in relative wages during this period. The interpretation of these results is supported by estimates made for the previous decade, 1949-1959.

The model of relative wages used here, with minor differences, has appeared previously in the empirical literature on discrimination. The specification was originally made by Landes (1968) in his study of the

effect of state fair-employment laws on the relative wages of nonwhite workers, and was modified by Ashenfelter (1972) in his study of the effect of unionism on relative wages.[42] The model was originally estimated using 1959 cross-sectional data; a variable representing fair-employment laws passed during the sixties is now added to the model. Each of the variables is measured in terms of its percentage change from 1959 to 1969, or from 1949 to 1959, except for the dummy and enforcement variables. The latter are as previously defined except that they are in linear rather than logarithmic form and exclude enforcement data for fiscal year 1970.[43]

The regression model is linear and takes the following form:

$$\%\Delta RWAGE = a + B_1\%\Delta RNUM + B_2\%\Delta RED + B_3\%\Delta RURBAN + B_4\%\Delta URBAN + B_5 SOUTH + B_6 FEPC58 + B_7 FEPCA58 + B_8\%\Delta UNION + B_9 CHG2 + B_{10} CHG2^2 + u. \quad (3.1)$$

The variables are defined and their sources stated in Table 5.[44] A value for each of the variables is assigned to each state.

A. The Effect of Enforcement on Relative Wages in the Economy

Table 6 presents OLS estimates of regression equations on the percentage change in the ratio of nonwhite to white male wages in the U.S. These equations were also estimated by TSLS with enforcement treated as endogenous; the reason has been discussed previously (see page 15 and note 34). There are no significant differences from the OLS estimates.[45] The equation in column 1 is estimated without a variable measuring the enforcement of Title VII; that in column 2, with a variable measuring the overall incidence of enforcement; and that in column 3, with variables measuring separately the incidence of enforcement of the employment and wage provisions.[46]

TABLE 5

List of Variables Used in Wage Analysis

Variable Name	Definition
RWAGE	The ratio of nonwhite to white male average wages. The average wage of nonwhite (white) males in each state is estimated by average annual earnings of nonwhite (white) males divided by average weeks worked of nonwhite (white) males. As Landes (1966) pointed out, the ratio of these measures is more correctly an estimate of relative weekly earnings. Data are from the 1960 and 1970 Censuses.
RINC	The ratio of nonwhite to white male average annual income. Data not available from the censuses are from Landes (1966, appendix A).
RNUM	The ratio of nonwhite to white males in the civilian labor force.
RED	The ratio of mean years of school completed of nonwhite to white males over 15 years of age and not enrolled in school, a proxy for the ratio of marginal products.
RURBAN	The proportion of nonwhite males in urban areas divided by the proportion of white males in urban areas. Males not in the civilian labor force are excluded.
URBAN	Proportion of all males in urban areas. Males not in the civilian labor force are excluded.
SOUTH	Same as in Table 1.
FEPC58	Dummy variable assigned a value of one for states with Fair Employment Practices commissions established prior to 1959 and zero elsewhere.
FEPCA58	Dummy variable assigned a value of one for states with Fair Employment Practices commissions established in 1959 or later and zero elsewhere.
UNION	Same as in Table 1 for 1970. The figure for 1960 was approximated by a simple average of figures for 1953 and 1964. Data for 1953 are from Troy (1957) and for 1964 from the Directory of National and International Labor Unions in the U.S. 1969.
CHG2, EMCHG2, and WACHG2	Same as in Table 1 excluding data for fiscal year 1970.

Note: Data are from the 1950, 1960, and 1970 Censuses unless otherwise noted.

TABLE 6

Regression Equations on the Percentage Change in the Ratio of Nonwhite to White Male Wages from 1959 to 1969 for the United States

Independent Variables	Estimated Coefficients and t-statistics (1)	(2)	(3)	Independent Variables	(1)	(2)	(3)
Relative numbers	.120 (1.42)	.103 (1.22)	.007 (0.09)	CHG2	...	...	...
				$CHG2^2$	...	$-.318 \times 10^5$ (1.24)	...
Relative education	.645 (1.78)	.783 (2.07)	.492 (1.35)				
				EMCHG2	...	...	...
Relative urbanization	-.159 (1.63)	-.173 (1.77)	-.267 (2.81)	$EMCHG2^2$	...	...	$.222 \times 10^6$ (1.70)*
Urbanization	-.868 (4.16)	-.921 (4.35)	-.987 (5.07)	WACHG2	...	...	$-.416 \times 10^3$ (3.14)***
South	.117 (2.61)	.119 (2.68)	.169 (3.85)	$WACHG2^2$	...	...	...
FEPC58	-.150 (3.26)	-.161 (3.46)	-.234 (4.74)	Constant	.111 (1.80)	.123 (1.99)	.220 (3.35)
FEPCA58	-.092 (2.51)	-.111 (2.81)	-.173 (4.00)	R^2	.621	.636	.703
				Number of observations	48	48	48
Unionization	-.172 (1.11)	-.208 (1.33)	-.295 (2.01)				
				F-test for enforcement	...	...	F = 5.06**

Source: See Table 5, Beller (1974), and Landes (1966).

Note: The regressions in this section include all states except Alaska and Hawaii. The District of Columbia is also excluded because of the large number of nonwhites employed by the federal government. All R^2 s in this paper are unadjusted.

*,**,***For enforcement variables, significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

An increase in the overall incidence of enforcement caused a more than proportionate reduction in the percentage change in relative wages between 1959 and 1969 (column 2). This effect is, however, insignificant. Evaluated at the mean value of CHG^2, and assuming that the estimated relationship is the true relationship, the effect of enforcement accounts for a 9.5 percent reduction in the percentage change in relative wages between 1959 and 1969 in the U.S.[47] Enforcement of the employment provision had a more than proportionate positive effect and enforcement of the wage provision had a linear negative effect on the percentage change in relative wages (column 3); the estimated coefficients are significant at the 10 percent and 1 percent levels, respectively. According to the F-statistic, they are jointly significant at the 5 percent level. The strength of the negative effect of the wage provision relative to the positive effect of the employment provision accounts for the estimated insignificant negative overall effect of enforcement.

As noted previously, differences observed in a single cross-section may have existed prior to enforcement. Hence, it would be desirable to estimate the percentage change in relative wages between 1949 and 1959 and the ratio of the 1959-1969 change to the 1949-1959 change using the enforcement variables from the original cross-section. However, the data used to estimate wages are not available for 1949. Therefore, income must be used as a proxy for wages.[48]

First, the estimated effect of enforcement on income and wages will be compared for the period 1959-1969, when data on both are available. Results of regression equations on the percentage change in the ratio of nonwhite to white male annual income from 1959 to 1969 for the U.S. are presented in the first three columns of Table 7. (The equations are the

same as those on relative wages in Table 6.) The regressions with the enforcement variables were estimated by TSLS; the coefficients differed significantly in a positive direction from coefficients estimated by OLS (see page 27 and note 45). Income appears to be a relatively good proxy for wages for use in the subsequent analysis: The estimated enforcement effects are in the same direction and have the same form as those on relative wages. The only difference is that they are less significant.[49]

B. Comparison of Intercensal Changes in Relative Income

In this section, income data will be used to determine whether, prior to enforcement, there were systematic differences among the states that were correlated with the variation in enforcement activities during the 1959-1969 census decade. Table 7 presents regression equations for the U.S. on the percentage change in relative income from 1949 to 1959 (columns 4 through 6) and on the ratio of the percentage change between 1959 and 1969 to that between 1949 and 1959 (columns 7 through 9). The equations of columns 4 through 7 were estimated with the OLS technique and the others with the TSLS technique. The independent variables in the ratio equations are expressed as the ratio of percentage changes except for the South and fair-employment dummies and for the enforcement variables, which enter as in all previous equations.

According to the estimates in columns 5 and 6, the overall incidence of enforcement and enforcement of the employment and wage provisions are unrelated to the percentage change in relative income in the pre-enforcement decade, 1949-1959. Therefore, it may be concluded that no systematic differences existed during this period that were correlated with subsequent complaint patterns. This evidence lends support to the interpretation

TABLE 7

Regression Equations on the Percentage Change in the Ratio of Nonwhite to White Male Annual Income from 1959 to 1969 and from 1949 to 1959, and on the Ratio of These Percentage Changes, for the United States

Independent Variables	Estimated Coefficients and t-statistics					
	Percentage Change 1959-1969			Percentage Change 1949-1959		
	OLS	TSLS		OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Relative numbers	.021 (0.35)	-.005 (0.08)	-.135 (1.19)	-.074 (1.13)	-.071 (1.07)	-.075 (1.10)
Relative education†	.203 (0.81)	.344 (1.07)	-.330 (0.63)	-.038 (0.12)	-.015 (0.05)	-.037 (0.12)
Relative urbanization	-.057 (0.85)	-.078 (1.09)	-.210 (1.75)	.224 (1.33)	.214 (1.26)	.225 (1.27)
Urbanization	-.489 (3.40)	-.527 (3.53)	-.629 (2.94)	.200 (1.29)	.232 (1.42)	.241 (1.44)
South	.089 (2.88)	.091 (3.07)	.175 (2.99)	-.141 (4.02)	-.131 (3.39)	-.142 (2.68)
FEPC58	-.075 (2.38)	-.086 (2.50)	-.203 (2.67)	...	...	...
FEPCA58	-.074 (2.91)	-.093 (2.47)	-.177 (2.55)	...	...	...
Unionization	-.064 (0.60)	-.105 (0.88)	-.214 (1.25)	.244 (1.07)	.231 (1.01)	.275 (1.07)

TABLE 7 —Continued

Independent Variables	Estimated Coefficients and t-statistics					
	Percentage Change 1959-1969			Percentage Change 1949-1959		
	OLS	TSLS		OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
CHG2	...	$-.435 \times 10^2$ (0.67)	...	...	$-.256 \times 10^2$ (0.67)	...
$CHG2^2$	...	...	...	...	...	...
EMCHG2	...	...	...	...	...	...
$EMCHG2^2$	...	...	$.569 \times 10^6$ (1.60)	...	...	$-.938 \times 10^5$ (0.63)
WACHG2	...	...	$-.780 \times 10^3$ (2.07)**	...	...	$.315 \times 10^2$ (0.20)
$WACHG2^2$	...	...	...	...	...	...
Constant	.096 (2.27)	.113 (2.38)	.261 (2.63)	.056 (1.42)	.053 (1.34)	.054 (1.33)
R^2	.600	...	...	.412	.419	.421

TABLE 7--Continued

Independent Variables	Estimated Coefficients and t-statistics: Ratio of Percentage Changes		
	OLS	TSLS	
	(7)	(8)	(9)
Relative numbers	-.165	-.138	-.258
	(1.62)	(0.75)	(1.74)
Relative education	-.355	.623	-.725
	(0.75)	(0.44)	(1.08)
Relative urbanization	-.006	.058	-.054
	(0.04)	(0.24)	(0.32)
Urbanization	-.278	-1.126	.221
	(0.82)	(0.95)	(0.34)
South	.206	.262	.306
	(3.95)	(2.20)	(2.80)
FEPC58	-.113	-.113	-.192
	(1.58)	(0.88)	(1.71)
FEPCA58	-.108	-.111	-.142
	(1.93)	(0.99)	(1.63)
Unionization	-.526	-.220	-.537
	(2.06)	(0.38)	(1.69)
CHG2	...	$-.114 \times 10^4$	...
		(0.85)	
$CHG2^2$	...	$.715 \times 10^6$	...
		(0.84)	
EMCHG2	...	...	...
$EMCHG2^2$	...	...	$.810 \times 10^6$
			(1.10)
WACHG2	...	...	$-.721 \times 10^3$
			(1.19)
$WACHG2^2$	...	...	...
Constant	2.361	1.926	2.454
	(3.60)	(1.41)	(2.93)
R^2	.564	...	...

Source: See Table 5, Beller (1974), and Landes (1966).

†The ratio of nonwhites to whites in 1949 and the ratio of nonwhite to white males in later years.

**For enforcement variables, significant at the 5 percent level.

of the coefficients on the enforcement variables from the 1959-1969 relative income percentage change equations. Moreover, since it has been established that relative income is a good proxy for relative wages, the evidence supports the interpretation of the relative wage estimates as well.

Finally, estimates of the effects of enforcement from equations on the ratio of the 1959-1969 to the 1949-1959 percentage change in relative income are shown in columns 8 and 9. The overall incidence of enforcement has an insignificant effect on the differential change in relative income between the decades. The effect of enforcement of the employment provision is positive and more than proportionate, and the effect of enforcement of the wage provision is negative and linear; these results show the same direction and form as those estimated using the 1959-1969 percentage change equations. Moreover, although insignificant at conventional test levels, the magnitudes of the coefficients on the employment and wage provision variables from this formulation are quite close to those from the 1959-1969 percentage change equation. Despite their relative insignificance, the similarity of the estimates between the two forms suggests that the effect of enforcement has been correctly estimated. Moreover, in the previous section it was shown that enforcement had a weaker effect on income than on wages. Hence, it is not unlikely that the estimated coefficients would have been significant had data on relative wages been available for the analysis.

In this section, the effects of the enforcement of Title VII on the percentage change in relative wages between 1959 and 1969 were estimated. It was found that (1) the overall effect of enforcement is negative but insignificant, (2) the effect of enforcement of the employ-

ment provision is positive, more than proportionate, and significant, and (3) the effect of enforcement of the wage provision is negative, linear, and significant. Moreover, it was established that these enforcement variables were unrelated to the percentage change in relative income in the pre-enforcement decade, 1949-1959, using relative income as a proxy for relative wages. Finally, the effects of enforcement on the ratio of the 1959-1969 percentage change to the 1949-1959 percentage change in relative income were estimated. While the overall effect was insignificant, the effects of enforcement of the employment and wage provisions were the same as those stated above. These results are taken as evidence that the enforcement effects on relative wages in the 1959-1969 percentage change equations have been correctly estimated. The insignificance of the ratio estimates by conventional test standards is unimportant in this regard since enforcement was found to have had a more significant effect on wages than on income in the original 1959-1969 cross-section.

IV. Summary and Conclusions

This study has investigated whether and to what extent enforcement of Title VII of the Civil Rights Act of 1964 helped to achieve the social goal of eliminating (or reducing) employment discrimination. To that end, a model was developed and tested that measures the effects of enforcement on the minority economic position in all firms under the law's jurisdiction: the direct effects in respondent firms and the demonstration effects in all, including nonrespondent, covered firms. The demonstration effect was hypothesized to be a function of the incidence of the law's enforcement.

The evidence suggests that in the aggregate, from its inception though fiscal year 1970, enforcement of Title VII at best left the economic position of black males unchanged and at worst caused it to deteriorate. The explanation appears to be simply that enforcement of the employment and wage provisions of the law had opposing effects on relative black employment and wages. While enforcement of the employment provision increased relative employment in covered firms and relative employment and wages in the economy, enforcement of the wage provision had precisely the opposite effects. Within the theoretical framework, these results suggest that the following occurred. The increase in demand for black relative to white males in covered firms that remained in business at the same location worked its way through the economy, resulting in overall increases in relative employment and wages. Hence, any secondary reductions in the relative demand for blacks resulting from the locational mobility of firms were weak compared with the primary effect. On the other hand, while enforcement of the wage provision probably resulted in increased wages for some blacks in covered firms (this could not be tested with available data), it also created an excess supply of blacks, thus depressing their relative wage in other sectors of the economy. Moreover, the latter effect appears to have dominated the former, although the net negative impact was, in general, statistically insignificant. In addition, the magnitude of the observed enforcement effects on relative employment and wages was found to vary directly with the incidence of enforcement across states.

It is concluded from these findings that the economics of enforcement of Title VII of the Civil Rights Act of 1964 has been inconsistent

with the social policy goal. While the results are broadly consistent with those of past Title VII studies, that is, that enforcement overall had little effect, they demonstrate the necessity of a more detailed causal analysis. It has been shown that the law's overall enforcement effect can be decomposed into two separate and opposing effects. An advantage of this decomposition for policy analysis is that it suggests modifications to the enforcement procedure that would move it closer to the goal of reducing employment discrimination. Two possible directions for enforcement are (1) concentrating limited resources on enforcement of the employment provision and (2) accompanying enforcement of the wage provision by strict and extensive controls on minority employment. While the first alternative relies solely on the economics of enforcement to bring about the desired results, the second requires additional enforcement powers to accomplish the law's goal. The power to issue cease and desist orders would enable the EEOC to limit the enforcement effects that work against this goal.

APPENDIX A

It will be shown in this appendix that (i) $dB/dk > 0$, (ii) $dW/dk < 0$, and (iii) $d(W + B)/dk < 0$, where k is a government-enforced employment ratio of blacks, B, to whites, W, and the firm's utility is assumed to be a function of profits, π, and the number of blacks employed:[50]

$$u = u(\pi, B)$$

with $u_1 > 0$, $u_2 < 0$, $u_{11} < 0$, and $u_{22} < 0$.

(i) Let $k^* B = W$ and note that $k = 1/k^*$.

Then u can be rewritten as

$$u = u\{P_o f[B(1 + k^*)] - B(w_W k^* + w_B), B\},$$

where P_o is the price of output, f is the production function with $f' > 0$ and $f'' < 0$, and w_W and w_B are the wages of whites and blacks respectively. Assuming that u is a concave function and maximizing u with respect to B and k^* yields

$$\frac{\partial u}{\partial B} = u_1[P_o f'(1 + k^*) - (w_W k^* + w_B)] + u_2 = 0. \qquad \text{(A1)}$$

Then $P_o f' = \dfrac{w_W k^* + w_B}{1 + k^*} - \dfrac{u_2}{u_1(1 + k^*)}$,

and if k^* is voluntarily selected,

$$\frac{\partial u}{\partial k^*} = P_o f' B - w_W B = 0, \qquad \text{(A2)}$$

then $P_o f' = w_W$.

Set $P_o = 1$.

Totally differentiating equation (A1), we obtain

$$f''[(1 + k^*)dB + B dk^*] = \frac{w_W}{(1 + k^*)} dk^* - \frac{w_W + w_B}{(1 + k^*)^2} dk^* - \frac{u_{21}[f'B - w_W B]dk^*}{u_1(1 + k^*)}$$

$$+ \frac{u_2 dk^*}{u_1(1 + k^*)^2} + \frac{u_2 u_{11}[f'B - w_W B]dk^*}{u_1^2(1 + k^*)}$$

$$- \frac{u_{22}dB - u_{21}[f'(1 + k^*) - (w_W k^* + w_B)]dB}{u_1(1 + k^*)}$$

$$+ \frac{u_2 u_{11}[f'(1 + k^*) - (w_W k^* + w_B)]dB + u_2 u_{12} dB}{u_1^2(1 + k^*)}$$

Now, if $u_{12} = 0$,

$$dB\left[f''(1+k^*) + \frac{u_{22}}{u_1(1 + k^*)} - \frac{u_2 u_{11}[f'(1 + k^*) - (w_W k^* + w_B)]}{u_1^2(1 + k^*)}\right]$$

$$= dk^*\left[-f''B + \frac{w_W}{1 + k^*} - \frac{w_W k^* + w_B}{(1 + k^*)^2} + \frac{u_2}{u_1(1 + k^*)^2} + \frac{u_2 u_{11}(f'B - w_W B)}{u_1^2(1 + k^*)}\right]$$

After simplifying with the aid of (A1) and (A2), we obtain

$$\frac{dB}{dk^*} = +\left[\frac{f''B}{f''(1 + k^*) + \frac{u_{22}}{u_1(1 + k^*)} + \frac{u_2^2 u_{11}}{u_1^3(1 + k^*)}}\right]$$

Since the expression in brackets is positive,

$$\frac{dB}{dk^*} < 0 \text{ and } \frac{dB}{dk} > 0$$

(ii) $$\frac{dW}{dk^*} = B + k^*\frac{dB}{dk^*} = B\left(1 + \frac{k^*}{B}\frac{dB}{dk^*}\right)$$

$$= B\left\{1 - \left[\frac{f''k^*}{f''k^* + f'' + \frac{u_{22}}{u_1(1 + k^*)} + \frac{u_2^2 u_{11}}{u_1^3(1 + k^*)}}\right]\right\}$$

Since $f''k^*$ appears in both the numerator and the denominator, the expression in the inner brackets is less than 1 and is positive. Hence,

$$\frac{dW}{dk^*} > 0 \text{ and } \frac{dW}{dk} < 0 .$$

$$\text{(iii)} \quad \frac{d(W + B)}{dk^*} = \frac{dW}{dk^*} + \frac{dB}{dk^*} = B\left\{1 - \left[\frac{f''k^* + f''}{f''k^* + f'' + \frac{u_{22}}{u_1(1 + k^*)} + \frac{u_2^2 u_{11}}{u_1^3(1 + k^*)}}\right]\right\}$$

Since $f''k^* + f''$ appears in both the numerator and the denominator, the expression in the inner brackets is less than 1 and is positive. Hence,

$$\frac{d(W + B)}{dk^*} > 0 \text{ and } \frac{d(W + B)}{dk} < 0 .$$

It is possible to show, using the second-order conditions, that these results also hold when $u_{12} \neq 0$.

APPENDIX B

In this appendix, the complete equation on the change in total relative black male employment in covered firms between 1966 and 1970 is presented with discussion of the important independent variables other than the enforcement of Title VII.

The equation is as follows:

$$
\begin{aligned}
&-.692 + .053\text{EMPL} + .215\text{CEMPL} + .291\text{PPB} + .089\text{CPPB} + .136\text{GMR} \\
&\quad (0.80)\ (1.73)\qquad (0.66)\qquad (4.87)\qquad (0.50)\qquad (2.29) \\
&-.119\text{UNEMPL} + .049\text{CUNEMPL} + .245\text{PFC} + .327\text{CHG1} + .021\text{CHG1}^2 \\
&\quad (1.64)\qquad (0.35)\qquad (1.54)\qquad (2.05)\qquad (2.16) \\
&+.101\text{FEPC64} + .007\text{UNION} - .105\text{SMSA} + .162\text{SOUTH} + .029\text{MFG} \qquad \text{(B1)} \\
&\quad (1.27)\qquad (0.10)\qquad (1.09)\qquad (1.88)\qquad (0.45) \\
&+.706\text{RBE66}. \qquad R^2 = .9975, \quad \text{Number of observations} = 46. \\
&\quad (11.23)
\end{aligned}
$$

The discussion encompasses the effects of (1) other equal employment opportunity legislation, (2) the lagged value of the dependent variable, and (3) the supply variables and South dummy.

(1) As stated in the text above, the federal contract compliance (PFC) and state fair-employment law (FEPC64) variables are expected to be positively related to changes in relative black employment. As seen in equation (B1), both variables have positive coefficients; the coefficient on PFC is significant at the 10 percent level using a one-tail test. Moreover, the coefficient on PFC is positive for all occupations and is significant at the 5 percent level for the technical and sales occupations. While the coefficient on FEPC64 is positive for most occupations, the only significant one is for the laborer occupation. The short-run adjustment elasticity of relative employment with respect to the proportion of employment in firms with federal contracts ranges between .04 for officials and managers and .91 for the sales occupations, with a modal value of .25.

(2) The coefficient on the lagged value of the dependent variable (RBE66) is equal to $(1-\lambda)$, where λ is the adjustment coefficient of relative employment to its target level. While these coefficients are significantly different from one for all occupational equations, they differ in magnitude. The modal adjustment coefficient is approximately equal to .2; they range from a low of .1 for operatives to a high of .8 for sales. The rate of adjustment is generally lower for the blue-collar than for the white-collar occupations.

(3) Aside from those discussed above, the most important independent variables in the equations are the supply variables. Excluding RBE66, PPB is generally the most significant independent variable and is consistently positive. Ceteris paribus, the greater the proportion of the population in a state that is black, the greater the change in relative employment. The adjustment elasticity of relative employment with respect to PPB ranges between .18 for the operative occupation and .60 for the professional occupation; the modal values are .2 and .3. The gross migration rate (GMR) is positive and significant for officials and managers, craftsmen, and total relative employment. The coefficient on the relative educational level of black males (RED), which entered the equations for the white-collar occupations only, is very high and significant for the professional and sales occupations; the adjustment elasticities are 2.4 and 2.6 respectfvely. These results indicate that an available pool of black labor led to greater changes in their relative employment.

Of substantial interest is the consistently positive (except for the professional occupation) coefficient on the South dummy. The coefficients are significant for the craftsmen and operative occupations and for total relative employment. They range between .03 for officials and managers and

.37 for craftsmen. (The coefficient for the professional occupation equals -.4 and is significant at the 10 percent level.) Stated simply, blacks made greater employment gains in covered firms in the South than outside the South between 1966 and 1970 in all categories of employment except professional.

NOTES

1. The commission, which was established by Title VII, has the power to receive and investigate charges of discrimination filed by aggrieved individuals or by a member of the commission who has reasonable cause to believe that discrimination has occurred. It may also conduct technical studies and provide technical assistance designed to further compliance with the law. It must submit an annual report to Congress and to the President.

2. The analysis in this paper focuses on blacks, and more specifically on black males, because the majority of complaints filed under Title VII through fiscal year 1970 were filed for discrimination on the basis of Negro race and the majority of these were filed by black males. Charges filed for discrimination on the basis of sex formed a constant 20 percent of complaints during this period.

3. The uncovered sector consists of those employed in firms with fewer than 25 employees, those employed in firms not in an "industry affecting commerce," the self-employed, those employed by religious institutions or by the federal, state, or local governments, and the unemployed. In 1968, about 25 percent of all employees in Social Security reporting units worked in units with fewer than 20 employees. (In 1972, the law was amended to bring within the covered sector those employed in firms with 15 to 24 employees and in government.) The uncovered sector, along with covered firms that continue to violate the law, determines the elasticity of supply of black labor to firms in the covered sector that choose compliance and, therefore, the magnitude of relative employment and wage changes that result from enforcement.

4. Laws like Title VII affect the behavior of firms through economic incentives; firms violating the law's provisions are subject to lengthy and

detailed investigations. They may also face costly court battles, which may result in court-ordered adjustments in hiring and personnel practices, back-pay settlements, attorney's fees, court costs, and adverse publicity.

5. Although this classification is not exhaustive, it is useful for current purposes. Other practices covered by the law, which are not classified under either of these provisions, include discrimination in terms and conditions, job classification, qualification and testing, advertising, benefits, and intimidation and reprisals.

6. The development here is based upon the analysis of featherbedding; for a good treatment see Simler (1965).

7. Court decisions under Title VII have stressed the importance of such statistical proofs in cases where unlawful exclusion has been charged. (EEOC, Fifth Annual Report, p. 20.) Although the discussion that follows is based upon a fixed-proportion work rule, for practical purposes the rule may be considered to have an acceptable range of variation around it that would constitute compliance.

8. The implications of the analysis are similar under the assumption that blacks are imperfect substitutes in production for whites (see Beller, 1974, pp. 33-34.)

9. In the case of employer discrimination against blacks, employers with the lowest tastes for discrimination hire all blacks while those with the highest tastes hire all whites. Those employers that are just indifferent between blacks and whites at the current wage ratio are integrated. In the case of fellow employee discrimination, blacks and whites are not hired in the same job because whites would have to be compensated for working with blacks. Integration occurs where whites'

distaste for working with blacks is just compensated by the current market wage differential. (See Becker, 1971, pp. 39-58.)

10. If relative gross wages are equal in both occupations, then for a firm to hire all blacks in L_1 and all whites in L_2, d_{2B} must be greater than d_{1B}. If L_1 is a low-skilled occupation and L_2 a higher-skilled occupation, this condition implies that firms have greater tastes for discrimination against higher-skilled than against lower-skilled blacks.

11. Of course, the total employment of blacks and whites at N in panel III must be consistent with that obtained from panels I and II.

12. It is unlikely that firms will move solely in response to enforcement. This will be one factor in the decision to move and will directly affect the choice of a new location. Of course, the preceding argument is only valid in the long run. In his large study of black employment in the South, Ray Marshall discovered that firms moving into the South moved into counties with relatively small black populations. When queried about the reasons for this choice of location, firms cited, among other reasons, the fear of enforced quotas of black employment. Given the relative immobility of the black population due to discrimination in housing and to poor public transportation, large movements of firms could significantly worsen employment opportunites for blacks. This problem deserves further study.

13. On the average, firms may be expected to move into an area with a black-to-white labor force ratio to which they are just indifferent at the current wage ratio. This would be approximated by the in pre-enforcement black-to-white employment ratio. In such a case, relative employment and wages in the covered sector would remain the same or increase, but would not fall.

14. For a treatment of the case of imperfect substitutes see Beller (1974, pp. 41-43).

15. If the firms affected by enforcement are only a small proportion of the industry, then the supply price of the industry may not be affected very much. Since industry-wide enforcement was not a common practice prior to 1970, this was probably true of the period under consideration in this study.

16. The relative wage in the uncovered sector will fall if the ratio of blacks to whites moving into employment in that sector is greater than the ratio of blacks to whites already employed there.

17. Whether there is a net outflow of blacks from the uncovered sector or a net inflow into the sector depends upon the elasticity of demand (η) for blacks and the turnover rate (δ) in the covered sector. If $\eta > \delta$, as is likely for the U.S., then there will be a net inflow to the uncovered sector. This analysis is similar to the analysis by Jacob Mincer of the effects of increasing the minimum wage (Mincer, 1974).

18. Since EEOC investigations cover all aspects of the firm's minority employment practices, there is an incentive for the firm to make sufficient adjustments in its practices to avoid discrimination charges.

19. The actual costs depend upon the seriousness with which the enforcement agency prosecutes the violators and the nature of the firm's violations. It is assumed that the first component of actual costs is constant across firms during any given time period and that the firm is aware of the costs associated with each level and type of violation.

20. As used here, proximity is defined by an information network, which may be determined by, for example, nearness of location, common output, common labor market, or any factor that determines the locus of the dissemination of information about EEOC enforcement activities.

21. The monetary value of discrimination is a measure of the amount of income a firm is willing to give up in order to indulge its desire to discriminate. For a detailed discussion, see Becker (1971, pp. 39-54). The choice between various types of compliance and violation depends in part on whether a firm prefers a larger uncertain income or a lower income with certainty. For a discussion of risk preference as it relates to the firm's decision to violate or comply with an antidiscrimination law, see Landes (1967). It is possible that some firms respond more to an increase in penalties than to an increase in the probability of apprehension. Their response depends upon their risk preferences. For a discussion of this point, see Landes (1966, p.19). In the current study, it is assumed that the penalties for each type of violation are known constants across firms. (The penalties associated with the violation of Title VII were probably increased by the 1972 amendments to the law; a future study might test the response of firms to that increase.)

22. This analysis depends upon the assumption that the direct effect of enforcement, the change in relative employment or wages in respondent firms in the absence of knowledge of other enforcement activity, is not itself a function of the incidence of enforcement. If EEOC enforcement activities were ordered by a size ranking of firms, then the size of the direct effect could depend upon the incidence of enforcement. The procedure followed by the EEOC has been to pursue discrimination charges in the order in which they are received. Since most charges are filed by only a few individuals and filing a charge is a relatively costless procedure, there is no reason to expect that, for example, large firms are charged first, and therefore, that the size of the direct effect is related to the incidence of enforcement.

23. For the period under study, which ends with 1970, the geographical definition of proximity is quite reasonable for the following reasons: (1) The enforcement activites of the EEOC have been carried out by region through a set of regional offices, and (2) it was only in 1972 that the EEOC instituted an industry-wide system of investigations. Prior to that date, there was no feedback from the local to the national level of information on the terms of agreements made with the EEOC. Ideally, one would want to determine the exact locus of the demonstration effects by analyzing firms grouped by other (smaller) geographical units. Due to the confidentiality requirements on the data used, however, the smallest geographical unit that can be studied is the state.

24. The original sources for these data are the EEO-1 employer reports collected annually by the EEOC from all firms with 100 employees or more and from all firms with government contracts. These reports contain information on employment by race and sex for each of the nine broad census occupational categories. Unfortunately, they contain no information on wages. The entire matched sample contains 40,445 firms from all industries. The matching process, the problems involved, and the potential biases in such a sampling procedure are discussed in Ashenfelter and Heckman (1974, pp. 14-26). They conclude from their statistical analyses of the probability of a successful match that "inferences drawn from our matched sample may not be too different from inferences that would have been drawn from the whole population of EEO-1 reports." The benefit of a matched sample for the statistical analysis of changes is that characteristics of the firms that do not change between the two years are automatically held constant. Moreover, this sample has the

added benefit for purposes of this study of allowing the only possible direct test of the theoretical model.

25. Estimates of the effects of enforcement on a broad measure of the occupational distribution of black males relative to white males, presented in Beller (1974), were found to be insignificant and are not presented here. Likewise, no evidence was found that federal contract compliance or state fair-employment laws improved the relative occupational distribution of black males (see Ashenfelter and Heckman, 1974, and Landes, 1968). The combined results of these studies suggest that, in general, equal employment opportunity legislation does not affect the gross measure of the relative occupational status of black males.

26. A similar model is used by Ashenfelter and Heckman (1974) in estimating the effects of federal contract compliance on changes in total relative black employment.

27. Assuming that firms seek to avoid the investigation that follows the filing of a charge, the number of charges recommended for investigation is an alternative measure of C. This variable is highly correlated with the number of charges filed, and empirical results using this definition do not differ significantly from those presented below. While it might have been desirable to consider the outcomes of investigated charges as independent variables (in addition to charges which are investigated), it is not possible to do so due to the recording methods used by the EEOC in their case files. However, this is not considered a serious drawback, since once an investigation begins the firm incurs costs. Moreover, this model is based upon the assumption that enforcement visibility alone is an important determinant of whether or not the firm takes steps towards compliance.

28. Detailed data on charges filed, by basis, sex, and issue, are available from the Division of Systems and Control of the EEOC. (Data on the aggregate numbers of charges filed by state are available from the published EEOC Annual Reports.) The data used in this study are charges filed--by males and females from four of the minority groups covered by Title VII—during fiscal years 1968-1970. These minorities include two racial minorities, Negro and American Indian, and two minorities on the basis of national origin, Spanish American and Mexican American. (The other minority groups covered by this law, for whom data are not used, are religious minorities and Orientals.) The largest proportion of all charges filed by members of these groups, 62.4 percent, were filed by Negro men. The employment analysis in this study is for black males only; however, the provision of the law that allows the EEOC to investigate all minority employment practices in a firm once it has been charged with discrimination suggests that charges filed by members of any of these minority groups potentially affect the relative employment of black males.

29. The law covers employees in firms with 25 or more employees. This measure is approximated by the number of employees in Social Security reporting units with 20 or more employees.

30. An ideal measure of the incidence of enforcement, which would take account of the location of discrimination charges and of the black population in a state, is unavailable; hence, the incidence measure used here is imperfect. Empirical results using the number of discrimination charges as the measure of enforcement are presented in the author's dissertation (Beller, 1974). These proxies, which yield similar estimates, form the two extremes for the true measure of the incidence of enforcement.

31. This variable controls as well as possible for differences across states in the current incidence of discrimination. For the matched sample of covered firms, the level of relative black employment in 1966 is expected to reflect any changes in the incidence of discrimination that followed the passage of Title VII in July of 1964. On the other hand, for the economy as a whole, the level of relative black employment in 1960 would not reflect such changes. To the extent that changes occurred and resulted in systematic variation across states in the incidence of discrimination and to the extent that the initial level of relative employment along with the traditional demographic factors do not control for that variation, the relative variation in C/N will not approximate the relative variation in C/P. If the incidence of discrimination were negatively related to the change in relative black employment across states, the estimated coefficients on the enforcement variables would be negatively biased. This factor is expected to have relatively little effect on the estimates for the covered sector.

32. A detailed description of the data sources is found in Beller (1974, appendix A.)

33. Clearly, other approximations of the underlying relationship would be reasonable. All regressions were also run using a linear functional form. Tests performed on the transformed residual sums of squares were consistent with the assumption that the underlying relationship was more closely approximated by the log-linear specification (see Box and Cox, 1964). Hence, the log-linear equations are presented in this paper; the linear equations, which yield similar estimates of the enforcement effects, can be found in Beller (1974, appendix B). The regressions are weighted by the square root of total employment in 1970 in the covered sector in each state to correct for heteroscedastic residuals.

34. A priori, it is unclear in which direction the simultaneity might operate: The demand for enforcement might be greater where relative changes are larger and expectations are rising or where they are smaller. For the relative employment equations, the first stage of the simultaneous equations model postulates the incidence of enforcement as a function of the change in relative black employment, the presence of a regional office of the EEOC in a state, and the exogenous variables in the model.

35. The degrees of freedom vary by occupation because some states had no black males employed in some occupations in either 1966 or 1970. The equations were also estimated excluding all states in which relative black employment was less than 1 percent in either 1966 or 1970. The states excluded were Maine, New Hampshire, Vermont, North Dakota, South Dakota, Montana, Idaho, Wyoming, and Utah. The results were virtually identical to those obtained with these states included.

36. This selectivity has been used to highlight the exact nature of the relationships that emerged for each occupation and to keep the tables uncomplicated. The author has estimates of all specifications for all occupations.

37. Note that the entire relationship falls in the negative quadrant because the variables are measured as the logarithm of a fraction. Hence, positive coefficients on both the linear and quadratic terms imply a U-shaped parabola.

38. These confidence intervals or belts were calculated using the prediction variance, which was very large (see Johnston, 1963, pp. 131-132).

39. The separate effects of enforcement of the provisions on the relative employment of professionals and sales, though jointly significant, cannot

be distinguished due to multicollinearity. A possible interpretation of the significant coefficients on the enforcement variables is that larger changes in relative black employment are indicative of an active and aware black population that demanded more vigorous enforcement once the law was passed. The existence of such an effect would become apparent in equations on changes in relative employment during a period prior to passage of the law, estimated with the original enforcement measures among the independent variables. Insignificant coefficients on these variables would indicate the absence of systematic differences in the dependent variable among the states that were correlated with subsequent variation in enforcement activities. While there are no data from an earlier period for the covered sector, the analysis of relative black employment in the economy uses census data, which is available for earlier years. Hence, it is possible to estimate the relationship between the enforcement variables and the change in relative black employment in the economy between 1950 and 1960, prior to enforcement, in the same manner as we estimate the change between 1960 and 1970, when enforcement occurred. The enforcement effect will also be estimated directly from an equation on the ratio of the 1960-1970 to the 1950-1960 change in relative employment. The coefficients on the enforcement variables from these equations yield estimates of how enforcement caused the change in relative employment in the enforcement decade to differ from the change in the pre-enforcement decade.

40. Coefficients on the enforcement variables from TSLS estimates did not differ significantly from the OLS estimates (see page 15 and note 34). TSLS estimation not only removes simultaneous equation bias but also tends to eliminate measurement error in the endogenous variables by the use of instruments in the first stage. As discussed above, it was suspected

that measurement error might be a problem in the regressions for the economy as a whole because of the uncertainty about controlling for variation in the current incidence of discrimination across states. That the TSLS estimates did not differ significantly from the OLS estimates suggests that the supposed negative bias on the enforcement estimates is not a serious problem.

41. The analysis of nonwhite, rather than black, male wages is necessitated by the categories of the 1960 Census from which the data are taken. In 1960, more than 90 percent of nonwhites in the United States were black.

42. Since the model is discussed in detail in Landes (1968, pp. 513-515), the discussion will not be repeated here. See also Beller (1974, pp. 162-166).

43. Enforcement during the latter half of fiscal year 1970 would not affect relative wages in 1969 but would affect relative employment in 1970. As a result, the enforcement variables used in the wage analysis are not strictly comparable to those used to analyze employment.

44. The sources of the 1969-1970 data are discussed in detail in Beller (1974, appendix A); those of the 1949-1950 and 1959-1960 data, in Landes (1966, appendix A).

45. While the TSLS estimates do not differ significantly from the OLS estimates, a noticeable increase in the significance of positive coefficients relative to that of negative coefficients on the enforcement variables is observed. Since the specification of the wage equations does not include among the independent variables the initial relative economic position of blacks, which, it has been argued, reflects variations across states in the current incidence of discrimination, the relative increase in the significance of positive coefficients probably arises from the elimination of measurement error in the enforcement variables (see note 40). The equation used

in the first stage of the simultaneous equations model postulates the incidence of enforcement as a function of the change in relative wages, the presence of a regional office of the EEOC in a state, the demographic characteristics of the black population used in the relative employment equations, and the exogenous variables in the model.

46. The specifications of the employment and wage enforcement variables presented in the tables in this section are chosen in the same manner as those in the previous section. The basis of that choice is described in the previous section (see page 16 and note 36). For the overall incidence of enforcement, the more significant of the linear or quadratic specifications is presented.

47. The mean percentage change in relative wages from 1959 to 1969 was 7.62 percent. This value was 0.8 percentage points lower than it would have been if the incidence of enforcement had been equal to zero. A 95 percent confidence interval around this value ranged between a reduction of 2.1 percentage points and an increase of .5 percentage points.

48. While the census does not have data on nonwhite income for some states in 1949, Landes (1968) has constructed estimates of it for those states. He shows that the correlation coefficient between relative income and relative wages in 1959, when data on both were available, is .93. From this he concludes that "an analysis of income in 1959 (and probably 1969) would not produce substantially different results from an analysis of wages." He points out, however, that "significant disparities could result with respect to the impact of any one independent variable. . . .on wages and income" (1968, p. 532, n. 28).

49. The effect of enforcement on relative annual income would be weaker than that on relative weekly wages if enforcement affected relative weeks worked and annual earnings in opposite directions. TSLS estimates on the percentage

change in relative weeks worked from regression equations of the form used throughout this section yielded estimates as follows: $-.348 \times 10^{6}$ $EMCHG2^{2}$ (1.82) and $.410 \times 10^{3}$ WACHG (2.03). The t-statistics are in parentheses. Hence, enforcement of the wage and employment provisions had significant effects on relative weeks worked, effects that were in the opposite direction from their effects on relative wages. This factor accounts for the relatively weaker effect of enforcement on annual income than on weekly wages. The effect of enforcement on relative weeks worked may be explained as follows. Enforcement of the employment provision increases relative nonwhite employment and wages. Nonwhite employment will increase by entry into the labor force of nonwhites who possibly have weaker labor force attachments than those already in. If they work fewer weeks, on the average, than those nonwhites already in the labor force, average weeks worked will be reduced. Enforcement of the wage provision reduces relative nonwhite employment and wages. It is probable that those nonwhites with the weakest labor force attachments drop out of the labor force entirely. If they have worked fewer weeks per year than those remaining in the labor force, average weeks worked will increase.

50. In an alternative case, utility is specified as a function of profits and the ratio of blacks to whites employed. This case cannot be handled by the standard mathematical techniques because it is known that the indifference curves are not convex. Therefore, the first-order conditions do not guarantee a maximum (see Arrow, 1973).

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