

# Impact of a Work Release Program on Earnings of Ex-Convicts\*

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A promising approach for the rehabilitation of felons is to increase their legal earnings potential. Work release programs include this as one of their goals. There have been, regrettably, almost no empirical studies investigating the success or failure of attempts to rehabilitate felons in our correctional systems. This lack of research is pointed out by Robert Martinson [7] in a comprehensive survey of research on the rehabilitation of offenders and by Richard Brautigam [2] in a recent paper on work release programs. Our paper contributes empirical results of the impact on earnings of participation in the work release program of the Maryland Correctional System.<sup>1</sup> Some of the determinants of earnings of felons after termination of incarceration are examined using multivariate techniques.

In recent years a number of economists have developed models explaining participation in illegitimate activities as a rational choice. The nature of the relationship between crime and punishment is discussed by Gary Becker [1]

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<sup>1</sup>The work release program is defined as release of a felon during the day to work at a conventional place of employment. The felon must return to the correctional facility at the end of each work day. Most participants are selected for the program in the year prior to the termination of their incarceration.

and George Stigler [8]. A model using the framework of the economic theory of choice under uncertainty, which takes into account costs and gains from both legal and illegal pursuits, is developed by Isaac Erlich [3]. This model suggests that the opportunities available in competing legal and illegal activities are important in determining the choice of participation and that illegitimate activity is in response to its more attractive incentives [3, p. 559]. In this context, recidivism can also be understood as a best choice among available alternatives.<sup>2</sup> The already low legitimate earnings potential for most convicts is extenuated by job discrimination against those with a criminal record and the effect of imprisonment on skills and experience. If, after imprisonment, nothing has happened to reduce expected costs or increase expected gains of legitimate activity, it should not be surprising if one returns to crime.

An assessment of the impact of participation in a work release program on legal earnings may be made by comparing annual earnings of participants with a similar group of nonparticipants. Legal annual earnings for an individual can be explained by the wage rate and the number of hours worked. The wage rate basically depends on productivity, while the number of hours worked depends on finding and holding a job. Productivity, in turn, is a function of several factors such as age, experience, skill, education and motivation provided by marriage. Securing a job is influenced by

<sup>2</sup>If our prisons do indeed serve as schools of crime, the ex-convict may also feel that the risk of being caught is reduced.

race, prior incarcerations and length of sentence, while job tenure depends on productivity as well as the attractiveness of the wage rate to the incumbent. The interaction of these variables may determine whether the ex-convict pursues legal activities or is unemployed and/or returns to crime. A formal model of the determination of earnings is presented in the appendix.

## Method

### *Research Setting and Subjects*

The research was carried out in the Maryland Correctional System which has a work release program. We selected participants from the minimum security unit. The System has three basic subdivisions: maximum, medium, and minimum security facilities; a multi-level selection process takes place before assignment to minimum security. This process may differ according to type of crime, race, drug or alcohol use, marital status, social class, employment record and other factors. Prisoners assigned to the medium and maximum security units are categorically excluded from this study.

The correctional system made no systematic evaluation of all prisoners in the minimum security unit for participation in the work release program. The number in the program represented only a small proportion of the total prison population assigned to the minimum security unit. Virtually all prisoners in the minimum security unit were considered eligible for the program.<sup>3</sup>

Prisoners who terminated their incarceration during a six month period in 1967 formed the data base. Two groups were selected. The first group consisted of those who had participated

<sup>3</sup>Interviews with correctional officials indicated that, because the opportunity for escape does not substantially differ between the minimum security unit and the work release program, selection for participation in work release approaches a random process. A concern arises about bias due to selection of participants possessing marketable skills for the program and is dealt with under the discussion of the skill variable.

in the Maryland work release program prior to discharge from the correctional system. A similar group of nonparticipants was selected randomly from those discharged during the same period. The 1967 time period was chosen because the work release program that existed earlier was substantially different. All participants were males drawn from the population of minimum security inmates.

### *Description of the Variables*

Earnings after the termination of incarceration for the years 1968 through 1970, as reported to the Social Security Administration, were used as the dependent variable. Accurate information on earnings in group data or coefficient form is available for research purposes from the Social Security Administration.<sup>4</sup> Earnings data were drawn from their records by Social Security number or by full name, date and place of birth and a parent's name. Twenty-eight of the original subjects were eliminated from the study because of incorrect numbers and/or inconsistent personal data. Those eliminated from the study were distributed evenly between work release and non-work release subjects.

Data for the independent variables were drawn from the files of the Maryland Correctional System. As in other studies of this nature, the variables included are limited to those provided by the data source. In general, each prisoner's file consisted of a case worker's summary prepared at the start of incarceration which included personal data and statistics, a

<sup>4</sup>Earnings data used in this paper were derived from statistics furnished by the Social Security Administration. The authors did not at any time have access to any information relating to specific individuals or reporting units. The authors assume full responsibility for the analysis and interpretation of the data.

Earnings as reported to Social Security do not include all earnings. By 1968, however, they included most forms of regular, long-term employment. We are assuming that any legitimate earnings that are unreported fall randomly between the work release and non-work release groups.

court summary of the crime committed with length of sentence and the prisoner's version. Information about education, skills, marital status, alcohol and drug use were derived directly from the prisoner with no additional verification. Other items included in the file were an F.B.I. summary of past arrests and incarcerations, and a brief record of the prisoner's behavior and status changes during incarceration.

Subjects were grouped by date of birth. A.I.D. analysis, a technique determining the most significant way to group data, indicates that no grouping could be found that had an appreciable effect on earnings.<sup>5</sup> This variable was dropped from the final model.<sup>6</sup>

The race variable included only two categories, white and black. It was expected that whites would have a significant advantage in earnings over blacks. The marital variable also included only two categories and it was anticipated that married men would have a better performance than the single, divorced, widowed or separated subjects. Marital status was recorded at the time of commitment.<sup>7</sup>

Each prisoner was asked at the time of commitment whether he used drugs and alcohol and the highest grade he completed in school.<sup>8</sup>

<sup>5</sup>Automatic Interaction Detector analysis (AID) was employed to identify interactions between variables in a group data format and to find the most appropriate groupings [6].

<sup>6</sup>Exclusion of this variable from the final model is supported by E. Jaques [5, pp. 202-209], who found that individuals with low skill levels, education and general capacity have a nearly flat curve of progression in earnings over age. Our sample has a mean age of 34.5, with a range between 21 and 45 for 94 percent of the sample. The contention that there would be a relatively flat curve of progression in earnings over age is also supported by Hanoch [4].

<sup>7</sup>Marital status at the time of discharge from the system would have been preferable, but the correctional system did not collect these data, nor did they record the number of dependents and changes in marital status during the years under study.

<sup>8</sup>The last grade completed by a prisoner was not corroborated by any systematic testing program to determine literacy and intelligence, which would have

These variables were not found to have any appreciable effect on earnings, perhaps because the data were incorrect, and were excluded from the final model.

Based on each prisoner's statement of his past work experience the authors categorized each subject into an unskilled or semi-skilled category. None of the subjects could be considered to be more than semi-skilled nor could these skills be considered highly marketable in a normal labor market. Although this variable did appear to help explain earnings, it was replaced in the final model by another variable, highest income prior to conviction, which was a better predictor and appeared to measure the same thing.

Data on the highest income prior to incarceration were obtained by searching each subject's Social Security income record for the year of highest reported income prior to 1967. This variable was adjusted to 1967 constant dollars by using the Average Manufacturing Wages Index [10, p. 67]. Highest past earnings was selected as a measure of earnings potential and it was expected to be linearly related to earnings after release.

Data were available on the number of previous arrests and incarcerations, but not on the length of the sentence previously served nor the type of institution in which it was served. Since these variables were highly correlated (0.95), only previous incarcerations were included in the final model. Previous arrests and incarcerations both were expected to be negatively related to income.

The number of months of the court determined sentence that was being served by each subject was included as a variable. The more serious crimes with long sentences are

been desirable variables. The mean grade completed was 8.25, and 95 percent had not gone beyond the eleventh grade. Poor school systems have tended to pass problem children from grade to grade, while they remain functionally illiterate. This may account for the poor performance of the education variable in explaining earnings.

crimes against persons, while economic crimes, such as failure to meet child support payments, carry a short sentence. The expected impact of this variable was not clear.

The length of time spent by those subjects who participated in the work release program was recorded in number of weeks. It was expected to be positively related to income earned after release.

#### Models for Earnings Determination

Multiple regression models are used to examine the variables related to earnings of the 236 felons in the sample, and to rate the importance of the work release variable<sup>9</sup> (see the appendix for a discussion of the earnings determination model). Six earnings regressions are presented. All models include five independent variables: weeks in work release program, prior incarcerations, length of sentence, race and high previous income. The first model examines these five variables and includes a sixth, marital status. A.I.D. analysis, which assists in identifying interactions between variables where theoretical reasons exist for suspecting it, suggests that there is significant interaction between the work release and marital status variables. A.I.D. operates as a series of sequential steps where the data are split into groups producing the greatest reduction in the error sums of squares [8]. The sample is therefore divided into married and unmarried subjects and Models II and III examine the earnings of the two groups separately. Models I through III span all three years included in the study, while Models IV, V and VI consider the problem of a temporary effect, and each year is examined separately.

A major concern in this study is the possibility of a bias in the selection process for

<sup>9</sup>A model of the form  $y_k = \alpha + \sum_{i=1}^n \beta_i x_{ik} + e_k$  where  $y_k$  is the average earnings for the years specified after termination of incarceration for individual  $k$ ,  $x_{ik}$  are independent variables, and the residuals  $e_k$  are assumed to be distributed independently of the  $x$ 's, with zero mean and variance  $\sigma^2$ .

participation in the work release program toward selecting those who had higher earnings prior to incarceration. The use of multiple regression does not eliminate entirely this potential bias, although the addition of other variables may help reduce the bias [4].

To determine the extent of this bias we divided the two groups, work release and non-work release participants, on the basis of high (over \$6,000 per year) and low earnings prior to incarceration. Using a contingency table to test for independence of the two characteristics, we are unable to demonstrate that selection for the work release program was dependent on previous high earnings (see Table 1).

As a further check on the possibility of selection bias we tested all independent variables for difference between means of the work release participants and the non-work release sample. There are no  $t$  values greater than  $\pm 1.75$  (see Table 2). Moreover, simple correlations between the work release variable and the other independent variables in the study are small, which suggests that bias is minimal (see Table 3).

#### Results

Average income in the 1968-70 period is used as the dependent variable in the first three models. The number of weeks in work release has a regression coefficient of \$13 per annum for each week spent in the program when all

TABLE 1  
Subjects Classified by Earnings and  
Participation in Work Release Program

	Earnings		Total
	Under \$6,000	Over \$6,000	
Work Release	99 (101.4) <sup>a</sup>	34 (31.6)	133
Non-Work Release	81 (78.6)	22 (24.4)	103
Total	180	56	236

$\chi^2 = .3585$ ,  $\chi^2 0.90(1) = 2.71$ .

<sup>a</sup>The expected numbers are shown in parentheses.

TABLE 2  
Test of Difference Between Means of Work Release and Non-Work Release Groups  
for Selected Variables<sup>a</sup>

Variable	Work Release (N = 133)	Non-Work Release (N = 103)	t Value (d.f. = 236)
Age	34.8	34.3	0.45
Married (married = 1; unmarried = 0)	0.245	0.299	-1.01
Skill (skilled = 1; unskilled = 0)	0.311	0.394	-1.44
Education (years)	8.38	8.11	0.86
Race (white = 1; black = 0)	0.265	0.362	-1.75
Length of Sentence (months)	64.8	46.6	1.74
Prior Incarcerations	1.91	2.59	-1.21

<sup>a</sup>Equal but unknown variances are assumed.

236 men in the sample are included, but this coefficient is not statistically significant at the 0.05 level (see Table 4, Model I). When the sample is divided into two sub-samples, a clearer picture emerges. For the unmarried group, 171 men, the regression coefficient is \$24 per annum for each week spent in the work release program, with a *t* value of 2.53 (see Model II of Table 4). Thus, 21 weeks of work release, which is the average time spent in the program, is worth about \$504 per year to each participant, which is almost a 20 percent increase in his annual income. The coefficient for the work release variable for the married part of the sample is negative and statistically not different from zero (see Model III of Table 4).

The married men in the sample, however, have higher legal earnings whether or not they participated in the work release program. The Erlich model suggests a reason for the differences in results between the married and the unmarried groups. Marriage may provide an incentive to choose legal activities, while participation in the work release program fulfills a similar role for the unmarried group. Since the married already have an incentive, they may fail to gain further advantage from work release participation.

The separate regression equations for estimating income of the unmarried group for each year since leaving the correctional system reveal a gradual increase in the value of the co-

TABLE 3  
Correlation Matrix of the Variables

	Earnings	Marriage	Weeks in Work Release	Prior Incarcera- tions	Length of Sentence	Race
Earnings	1.000					
Marriage	0.234	1.000				
Weeks in Work Release	0.114	-0.060	1.000			
Prior Incarcerations	-0.115	-0.031	-0.055	1.000		
Length of Sentence	0.125	-0.052	0.041	-0.041	1.000	
Race	0.102	0.091	-0.172	0.101	-0.061	1.000
High Previous Earnings	0.377	0.231	0.088	-0.135	-0.133	0.202

TABLE 4  
Regression Results for Selected Determinants of Earnings

Model	I	II	III	IV	V	VI
	1968-1970	1968-1970	1968-1970	1968	1969	1970
	All Cases (N = 236)	Not Married (N = 171)	Married (N = 65)	Not Married (N = 171)	Not Married (N = 171)	Not Married (N = 171)
Constant Term	844.69	813.67	971.01	853.34	972.25	615.39
Marital Status	824.61 (2.72) <sup>a**</sup>					
Weeks in Work Release	12.99 (1.53)	23.99 (2.53)*	-9.08 (-0.49)	18.17 (2.02)*	25.63 (2.41)*	28.16 (2.40)*
Prior Incarcerations	-26.40 (-0.97)	-27.84 (-1.06)	-32.35 (-0.24)	-27.77 (-1.12)	-27.76 (-0.94)	-27.99 (-0.86)
Length of Sentence	4.23 (2.95)**	3.65 (2.65)**	12.42 (1.90)	3.51 (2.68)**	3.28 (2.12)*	4.17 (2.44)*
Race	246.06 (0.84)	565.33 (1.74)	-514.35 (-0.80)	477.18 (1.55)	381.18 (1.05)	837.64 (2.09)*
High Previous Income	0.30 (5.30)**	0.25 (4.05)**	0.49 (3.36)**	0.24 (4.14)**	0.24 (3.53)**	0.26 (3.42)**
R <sup>2</sup>	0.21	0.19	0.20	0.18	0.15	0.17
Ratio	10.14**	7.94**	2.91*	7.44**	5.93**	6.54**
Degrees of Freedom	(6,229)	(5,165)	(5,59)	(5,165)	(5,165)	(5,165)

<sup>a</sup>*t*-ratios are shown in parentheses.

\*Indicates that the variable is significant at the 0.05 level.

\*\*Indicates that the variable is significant at the 0.01 level.

efficients for weeks in work release. The coefficient for 1968 is \$18 per annum for each week in work release with a *t* value of 2.02. In 1969 the coefficient is \$26 with a *t* value of 2.41 and in 1970 the coefficient is \$28 with a *t* value of 2.40. These results suggest that the effect of the work release program lasts beyond the period during which the participant has the advantage of holding a job upon termination of incarceration. It should also be noted that data collection began with 1968, although all subjects in the sample terminated their incarceration no later than mid-1967.

Marital status fulfilled expectations that it would be an important variable for explaining income. The regression coefficient for the marriage variable is \$825 per year, significant at the 0.01 level (see Table 4, Model I). We suspect that this variable would have been an even better predictor if marital status information had been available at the time of leaving the system, instead of at the time of entry.

The number of prior incarcerations variable is not statistically significant, although it does have a negative coefficient. The length of sentence, however, is significant and positive for the sample as a whole (*t* = 2.95). Examining the married and unmarried groups separately, length of sentence is significant at the 0.01 level for the unmarried, but only at the 0.10 level for the married group (see Table 4, Models II and III). The results would seem to suggest that longer sentences are associated with higher incomes. It may be that felons with short sentences committed economic crimes, perhaps because they lack good work skills, while felons with longer sentences committed crimes against persons but do not necessarily lack good work skills.

Race is not a significant variable in our study. A possible explanation is that once a person has a criminal record he faces discrimination on this basis whether he is white or black. The subjects in our study may effec-

tively have zero human capital in terms of the labor market. If we also consider the fact that whites have higher average earnings than blacks in the general work force, white felons should have more to lose in terms of foregone earnings than blacks while in prison and their relative reduction in earnings potential is greater upon release. The effect of a criminal record, however, may be temporary, as the race variable is significant at the 0.05 level for unmarried subjects in the last year of the study. Further study is needed to substantiate this finding.

As expected, highest previous earnings is a highly significant variable in terms of explaining income after leaving the correctional system. The coefficient is \$0.49 for each dollar of previous income for the married, \$0.25 for the unmarried, and \$0.30 overall. All are statistically significant at the 0.01 level or better (see Table 4).

#### Discussion and Implications

If Erlich and other economists are correct, for most offenders the decision to engage in criminal activity may indeed be rational. Programs that reduce the gain or increase the costs of illegal pursuits can be expected to reduce the participation in criminal activity. Conversely, it is important to know whether the expected value from legal pursuits has been increased by participation in a work release program. For the unmarried work release participants in our study there appears to be a significant positive impact on reported legal earnings. The coefficient for weeks in work release is about \$504 per year for a participant who had spent an average amount of time in the program. This value represents a 20 percent increase in his average annual income. The increase may reflect a greater legal earnings potential due in part to improved work skills, more time spent in legitimate activities, or both. Work release is not a significant variable in explaining the earnings of the married portion of our sample. Perhaps the married have less need for the role that work release fulfills for the unmarried.

Several other variables are valuable predictors of income. Highest previous earnings is a strong predictor of future earnings for the ex-convicts. Marital status is also a good predictor of future income.

#### Conclusion

There are several suggestions that we would make for other studies. First, a larger sample should be drawn, using a stratified sample approach to insure that enough subjects are included in all categories of interest. Second, some differentiation should be made for the type of work release job that was held by the participant. Jobs involving training and/or promotional possibilities may have a greater effect on earnings. Third, we suggest that the work release program should be studied in combination with other programs within the correctional facility. It may be that earnings are maximized where work release participation is combined with vocational training, remedial education, psychological counseling or some other program. Our findings strongly suggest that further study is merited.

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#### Appendix

The model for determining the earnings of an ex-convict during a given time period may be described by the simultaneous equation set (1)-(7) below. The reduced form equation (8) is utilized in this study.

- (1)  $EARN = (WAGE)(HOURS)$
- (2)  $WAGE = f_1(MARKET, SKILL, EDUC, PERS, WRKHST) + \epsilon_1$
- (3)  $HOURS = TOTHR - (UNEMPL + INCARC + DRUG + ILLG + HEALTH + LEISR) + \epsilon_2$
- (4)  $SKILL = f_2(SKILL-1, WRKREL, OTHPGM) + \epsilon_3$
- (5)  $WRKHST = f_3(WRKHST-1, WRKREL, OTHPGM) + \epsilon_4$
- (6)  $UNEMPL = f_4(PERS, CRMREC, WRKHST) + \epsilon_5$
- (7)  $CRMREC = f_5(CRMREC-1, CRSENT) + \epsilon_6$
- (8)  $EARN = f(EARN-1, RACE, MRSTAT, WRKREL, CRMREC-1, CRSENT) + \epsilon_7$

Earnings (EARN) are equal to the average wage during the period (WAGE) times the total hours worked (HOURS). MARKET represents the set of wages and working conditions known to the individual. SKILL is a measure of skills obtained by the individual through vocational education and on-the-job training. EDUC measures formal academic education. PERS is a vector of characteristics such as age, marital status (MRSTAT), sex, and race. WRKHST is another vector which includes characteristics such as tenure on previous jobs, type of previous jobs, quality of references, relevant experience and recent job performance. HOURS are described as the total hours in the given time period (TOTHR) minus the time spent for other reasons (unemployment, incarceration, drug and alcohol abuse, illegitimate activities, health reasons and leisure). WRKREL measures the number of weeks spent in a work release program. OTHPGM is a vector showing other vocational and educational programs. CRMREC-1 is the number of previous incarcerations and CRSENT the length of the current incarceration. A negative one (-1) added to a variable means the value of that variable in a previous period.  $\epsilon_1$  through  $\epsilon_7$  represent error terms in each equation.

The reduced form equation (8) contains only variables that we believe would change or whose effect would have changed since our measure of previous income. Previous income, of course, is also a function of the system of simultaneous equations (1) through (7) using the values of the previous period. It would be inappropriate to repeat variables such as age, sex, education, skill, family background and so forth unless there has been some change, since they are reflected in the previous income variable (EARN-1). Therefore the reduced form equation (8) is used for this statistical estimation. All variables included can be considered to be determined in a block recursive manner.