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A BENEFIT/COST ANALYSIS OF INSTITUTIONAL TRAINING PROGRAMS IN MICHIGAN PRISONS

By

Sandra Elaine Gleason

A DISSERTATION

Submitted to
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ABSTRACT

A BENEFIT/COST ANALYSIS OF INSTITUTIONAL TRAINING PROGRAMS IN MICHIGAN PRISONS

By

Sandra Elaine Gleason

Vocational training programs are provided to prison inmates to expand their post-release legitimate job opportunities and thereby discourage future criminal activity. However, the focus on recidivism in most prior evaluations of the impact of training has provided little information about the full benefits of training, including the impact on post-prison earnings, or the costs of these programs. In addition, little is known about the training variables influencing the post-release experience of ex-offenders.

This study employed an ex post facto quasi-experimental design to evaluate the impact of vocational training programs provided in three Michigan prisons on the probability of recidivism and average post-prison legitimate earnings. It employed data collected from two sources. The Michigan Department of Corrections provided demographic data for the sample, recidivism data, prison academic records, and information about the costs of programs and incarceration. The Social Security Administration provided income data from the Lifetime Earnings Record.

The sample included 772 men aged 17 to 54 at the time of sentencing who were released from January, 1969 through

December, 1973. It contained 386 vocational trainees and 386 controls. The trainees and controls were matched using a numerical score created with a factor analysis based on twenty-five pre-prison background characteristics. The follow-up period extended through December, 1974.

Multiple regression techniques were employed to determine the impact of vocational training. A variety of pre-prison and prison experience variables were included in the regressions to control for non-experimental variations. The results of the regression analysis were used to evaluate the benefits and the costs of vocational training.

The empirical results of this research indicate that the professional vocational training programs, consisting of computer programming, data processing, electronics, machine drafting, and vocational music, consistently demonstrated a favorable impact on the trainees. As a consequence they reduced the probability of recidivism and increased the average annual post-prison earnings. The largest reduction in the rate of recidivism among the professional trainees was found among program completers who were enrolled in one training program for seven months or more. However, the largest gain in average annual post-prison earnings accrued to professional program completers enrolled in one program for six months or less. This suggests that the reduction of recidivism cannot be explained completely by gains in legitimate earnings. The decision to "go straight" reflects a wide range of factors including job satisfaction and career potential.

In contrast to the professional programs, the programs teaching clerical, operative, craftsman, and service worker skills failed to consistently demonstrate a favorable impact on the trainees which would reduce the probability of recidivism or increase post-prison earnings. However, enrollment in these training programs as a way of earning credits toward a high school degree did result in higher post-prison earnings. This income gain was also experienced by men who received a high school equivalency certificate while in prison. In addition the significant personal characteristics generally predicted the patterns of recidivism and earnings as expected.

The benefit/cost ratios for the entire trainee group could not be estimated. However, the ratios were calculated for the professional trainees as a rough guide to the return to investment in human capital through successful vocational training. The professional programs were a wise investment for the individual trainee, the taxpayers, and society as a whole.

To my parents

Edmund Hall Gleason

and

Bonnie Lee Johnston Gleason

with gratitude for their
unfailing encouragement

ACKNOWLEDGEMENTS

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The cooperation and assistance of many people too numerous to mention made this research possible. Notable among those providing guidance and encouragement are the members of my dissertation committee: Daniel Hamermesh, Chairman; Daniel Saks, John McNamara, and Aaron Gurwitz. Michael Borus also provided many helpful comments. The administrators and staff of the Central Office of the Michigan Department of Corrections, as well as those of the State Prison of Southern Michigan, the Michigan Reformatory, and the Michigan Training Unit, were very helpful in all phases of the research. Anne Oribello in the Applications Programming Office of the Michigan State University Computer Laboratory completed most of the computer data preparation

and factor analysis. Joseph Salis was my primary liason with the Office of Research in Statistics in the Division of Statistics at the Social Security Administration, and programmed the data collection and human capital regressions analysis provided by that agency.

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CHAPTER 1

THE THEORETICAL FRAMEWORK

1.1 Introduction

Criminal activity can be viewed as an occupational choice made by an individual who ". . . evaluates all possibilities within the limits of all information which he possesses and chooses that activity which maximizes his utility."[1] To the extent that criminal activity is the result of limited vocational choices and opportunities, the provision of education and vocational training for jobs with good legitimate career opportunities should expand these individual choices and encourage lawful economic activities, particularly if the legitimate wage is greater than the illegitimate wage. This consequently should reduce criminal activity. Human capital theory suggests that the result of this investment in human capital will be a reward accruing over the working life of an individual in the form of increased income flows, and that both the individual and society will profit from the investment as measured by benefit/cost analysis.

The application of human capital theory to the measurement of the impact of prison education and vocational training is complicated by the life cycle of many ex-offenders. This can be illustrated with reference to

Figure 1.1. Figure 1.1A indicates the life cycle of the law-abiding individual. The uninterrupted progression from educational achievement to legitimate employment and earnings makes the analysis of the impact of education a straightforward exercise. In contrast Figure 1.1B shows the life cycle of a criminal and the zigzag path which many criminal careers follow.

> Criminals go from noncrime to crime and to noncrime again. Sometimes this sequence is repeated many times, but sometimes criminals clearly go to crime only once; sometimes these shifts are for long duration or even permanent, and sometimes they are short-lived.[2]

As a consequence of the zigzag pattern the true impact of various types of education on recidivism and income is more difficult to measure due to interruptions in employment for incarceration and the lack of data on illegitimate income.

Despite the difficulties encountered in tracing the criminal in his zigzag path, increased attention has been focused in recent years on the evaluation of institutional or prison vocational training programs. Most studies have tried to determine whether an investment in human capital provides new vocational opportunities which replace criminal activity and reduce recidivism, but relatively little has been done to measure the impact on post-prison earnings. However, at present, the information available on prison training programs consists largely of inventories of topics which should be studied but have not been adequately explored. Little is known about the costs and benefits of institutional training programs in the prisons, and the

FIGURE 1.1. Life Cycle Earning Process for Individuals With and Without Prison Experience

Figure A. Life Cycle Earning Process for Individuals Without Prison Experience

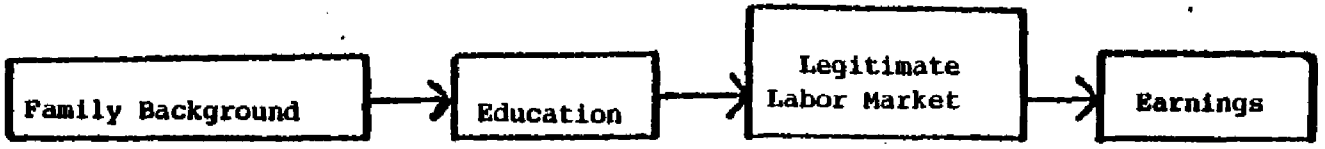
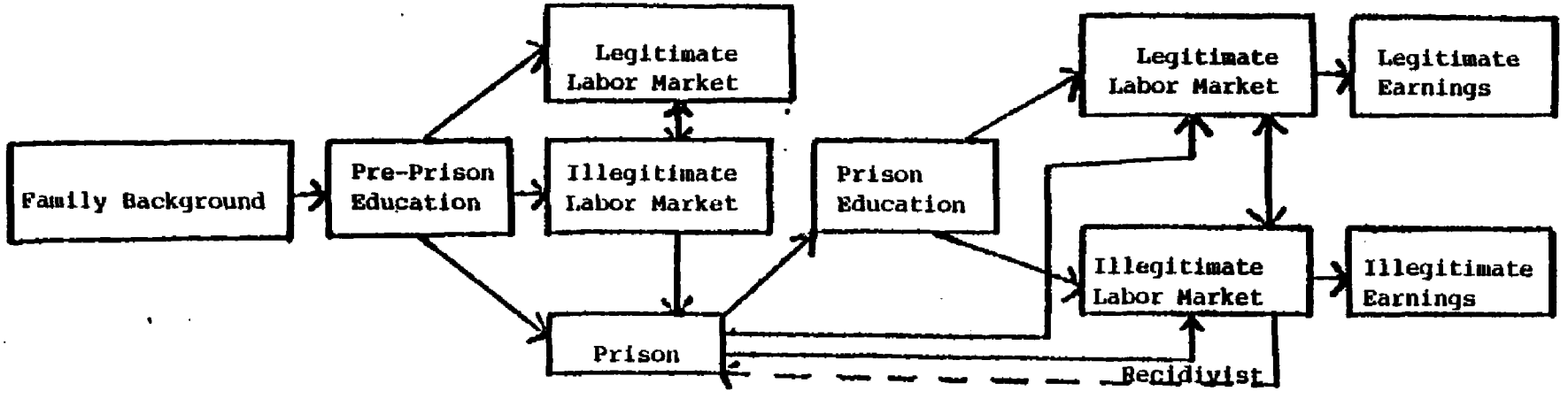


Figure B. Life Cycle Earning Process for Individuals With Prison Experience



training variables determining the overall post-release successes or failures of inmates. Until we know more, it will be difficult to determine how adequately prisons are achieving their rehabilitative goals and to justify, on any objective basis, those prison reforms which might improve rehabilitation efforts, particularly for those inmates who cannot be enrolled in community based programs.

Our knowledge of the benefits and costs of prison training programs has been limited by two factors: the unavailability of public funds for studying these programs, and the inadequate research designs of previous studies. Six design problems can be distinguished. First, control groups have not been used or have been poorly used. Second, the follow-ups of ex-offenders after their release from prison have covered relatively short time periods.[3] Third, there has been only a limited use of sophisticated statistical methods to control for non-experimental variations. Most studies have emphasized survey methods to collect data and have simply constructed frequency distributions of their results rather than use regression techniques.[4] Fourth, the studies employing control groups have typically used a single trainee-control variable to measure the vocational training experience. Fifth, the studies have been built on the assumptions that: offenders want to work in legal occupations; offenders will accept the alternatives of a legitimate work role if the choice is offered; and the acceptance of a legitimate work opportunity will prevent

criminal activities.[5] Consequently, relatively little attention has been given to identifying which offenders are most capable of profiting from training. Finally, benefit/cost analysis of vocational training from the perspective of the individual, the taxpayer, and society as a whole has seldom been done.

The present study corrected the design limitations of prior research on prison vocational training through the combination of six special features. First, the vocational trainee group has been matched with a control group on the basis of a spectrum of pre-prison characteristics to ensure that the treatment effects are adequately measured. Second, the longitudinal follow-up of the sample is relatively long and ranges up to five years for some inmates. This was made possible due to the use of two longitudinal data bases: the income recorded in the Lifetime Earnings File of the Social Security Administration and the computerized records of the Michigan Department of Corrections. Third, the analysis of the impact of vocational training on the rates of recidivism and post-prison income is based on multiple regression techniques. This enables a variety of pre-prison and prison experience variables to be included in the analysis in order to control for non-experimental variations. Fourth, the analysis of the vocational training is relatively detailed. It includes variables measuring the characteristics of enrollment and breaks the training programs into five types of programs. Fifth, the results of the analysis of the

impact on recidivism and post-prison income of vocational training have been presented to show which inmates benefit most from training. Finally, the empirical results have been combined into a benefit/cost analysis for the sample from the perspective of the individual trainee, the taxpayer, and society.

1.2 Participation in Criminal Activities: the Utility Maximization Model

The theoretical framework for this study is the economic model of criminal activity formulated by Becker, and later modified by Ehrlich and others. The Becker analysis[6] assumes that a person is rational, has a limited amount of time T which can be allocated to leisure (T_a), lawful employment (T_l), and unlawful activities (T_i), such that $T \equiv T_a + T_l + T_i$, and $T_a, T_l, T_i \geq 0$. An individual will commit an offense if the expected utility of an unlawful activity exceeds the utility which he would receive from using his resources in other activities. His utility function is

$$U = U(Z_l, Z_i)$$

where $Z_l = h_l(X_l, T_l, T_{al})$

$Z_i = h_i(X_i, T_i, T_{ai})$

$T_a \equiv T_{al} + T_{ai}$.

Lawful commodities (Z_l) and unlawful commodities (Z_i) are the basic commodities which provide utility. Z_l is produced by the individual by combining T_l and/or some portion of leisure time devoted to lawful activities with lawful goods

(X_1); Z_i, by combining T_i and/or some portion of leisure time devoted to unlawful activities (T_{ai}) with unlawful goods (X_i). An individual will choose the combination of Z_1 and Z_i which maximizes his utility subject to the expenditure function:

$$Z = g\ (Z_1, Z_i),$$

where Z is the bound on resources.

The expected utility from participating in unlawful activities during a specified period of time is defined as:

$$EU_i = p_i U_i (Y_i - f_i) + (1 - p_i) U_i Y_i,$$

where Y_i is his monetary and psychic income from an offense, f_i is the monetary equivalent of the punishment, and p_i is the probability of conviction. If the marginal utility of income is positive:

$$\frac{\partial EU_i}{\partial p_i} = U_i (Y_i - f_i) - U_i Y_i < 0$$

and

$$\frac{\partial EU_i}{\partial f_i} = -p_i U_i' \ (Y_i - f_i) < 0 \ .$$

The supply of offenses by any person for a specified time period will depend on several factors: the probability of conviction; the punishment if convicted; the income available to him in lawful activities, including schooling ($Y_1(T_1)$), and unlawful activities ($Y_i(T_i)$); the extent of risk preference for criminal activities (r); the probability of unemployment in the lawful labor market (N_1); and other variables (m_j, a portmanteau representing these additional

influences). The supply of offenses function O_i can be represented as

$$O_i = O_i\ (p_i, f_i, Y_l, Y_i, r, N_l, m_j).$$

Consequently,

$$\frac{\partial O_i}{\partial p_i} < 0,\ \frac{\partial O_i}{\partial f_i} < 0,\ \frac{\partial O_i}{\partial Y_l} < 0,\ \frac{\partial O_i}{\partial Y_i} > 0,\ \text{and}\ \frac{\partial O_i}{\partial N_l} > 0.$$

The inclusion of risk preference complicates the analysis of occupational choice considerably.[7] The question of whether crime pays in terms of expected marginal returns is a function of the attitude toward risk. The extent to which offenders specialize in criminal activities is determined by both their attitudes toward risk and their relative opportunities in lawful and unlawful market activities. Given an offender's preferences and opportunities, it may be optimal for him to be a recidivist, particularly if his lawful market opportunities remain unchanged.

Ehrlich has expanded the Becker analysis of the supply of offenses in two directions. Whereas the Becker analysis focuses on occupational choice between mutually exclusive unlawful and lawful activities, Ehrlich presents the offender's decision problem as that of the optimal allocation of his resources under uncertainty among his available lawful and unlawful market opportunities. Ehrlich thereby links the theory of participation in unlawful activities with the general theory of occupational choice.[8] In addition, Becker's work fails to discuss the implications of his model for the relationship between education and

crime, but Ehrlich expands the model to include education as a variable determining the number of offenses (see section 1.3 below).

Several features of the Becker-Ehrlich model have been criticized by Block and Lind,[9] but the major criticism was developed by Block and Heineke.[10] Block and Heineke argue that the increase or decrease in the relative return to a lawful or unlawful activity creates a substitution and a wealth effect. The unambiguous signs of the effects of changes in payoffs, enforcement, and punishment in the Becker-Ehrlich model occur only because they assume a special case of positive wealth effects. However, there is no way to know a priori whether this assumption is justified since the possibility exists that unlawful activities may be Giffen activities. The authors therefore conclude that policy recommendations cannot be determined by theory but rather require empirical determination of the relative magnitudes.

The models discussed above explain only the supply side of the criminal labor market. The theoretical development of the demand side of the labor market opportunities for ex-offenders has been relatively neglected. A theory of the effect of a criminal record on the employability of an ex-offender has not been developed, despite the documentation of the many problems encountered by ex-offenders.[11] The difficulty confronted in the development of such a theory is the lack of consensus about how the disclosure of a criminal record affects employers. It may reduce

employment prospects if the employer is antagonistic to ex-offenders, or it may improve prospects if the employer is sympathetic.[12] However, Glaser concluded that the primary barrier to employment is not a criminal record but rather the lack of extensive or skilled work experience.[13]

A modification of Phelps' theory of statistical discrimination[14] can be used to resolve the difficulty discussed above. Phelps argues that employers want to select the best quality workers, but must base their choice between two equally unknown workers on limited amounts of readily available but imperfect information in order to minimize hiring costs. Two sets of data are therefore used by the employer in the selection process: data which reflect direct influences on probable performance on the job, such as education, skill, and prior work experience; and proxy variables, such as race, sex, and a criminal record. These proxies are often based on unscientific stereotyped beliefs about expected behavior, but the statistical prejudice is economical since the employer does not have the resources or prefers not to use available resources to collect the data necessary to determine whether a given individual fits the group stereotype.

Consequently an ex-offender may be disqualified from a job for two reasons. First, his prior work experience and/or skills may be inadequte. Alternatively, although his qualifications are equal to those of other job applicants, given race, the presence of a criminal record lowers the

employer's subjective estimation of his predicted performance when the employer is antagonistic to ex-offenders. In contrast, an ex-offender's opportunity for employment is increased when his qualifications are equal to those of other applicants but the criminal record biases the employer in his favor.

1.3 The Impact of Vocational Training on Post-prison Criminal Activity

The newly released offender will make a decision about resuming criminal activity based on the same factors as those which he considered when he initially began his criminal career: the probability of conviction, the cost of punishment, the wage in unlawful and lawful employment, his risk preference, and the probability of unemployment in lawful activities. The time spent in prison may be employed to modify the offender's perspective on these variables so that he will choose to pursue lawful activities after his release from prison. In order to accomplish this, it is necessary to alter his preferences and/or employment opportunities.

Human capital theory suggests that an important method of achieving the objective of directing the released offender into lawful activities should be the provision of vocational training programs during incarceration. The successful completion of a vocational training program should develop skills which can be sold in the legitimate labor market at a higher Y_1 than before incarceration. The

trained ex-offender should be more attractive to employers and therefore experience less unemployment, thereby further raising his earnings. However, it is possible that prison training ". . . may markedly raise an inmate's vocational aspirations without . . . appreciably increasing his capacity to satisfy these aspirations upon release."[15] The frustrations created by the gap between the Y_1 expected by the newly released offender as compared with the actual Y_1 may discourage a commitment to lawful employment.

Mincer's schooling model[16] can be employed to express the theory of the gains from investment in human capital. Although the major monetary costs of training are borne by society, the inmate bears an opportunity cost. Time spent in training for which he receives a small wage competes with time during which he could be employed in a prison industry or institutional job at a higher wage, when he could be idle and earning no lawful wage, or when he could be earning unlawful income through "hustling" or "dealing" activities inside the prison. Consequently, the inmate will choose to invest in human capital only if he perceives any benefits from training. These benefits may be monetary, such as receiving veterans educational benefits, or non-monetary. In the short run vocational training gives him something to do, provides some income, and he may hope that it will speed up his release on parole.[17] In the long run it is an opportunity to compensate for past failures by learning a trade so that he can find better lawful jobs after release.[18]

This will raise the level of his future legitimate income streams as compared with his pre-prison income.[19] At the time the investment is undertaken, the present value of the real earnings stream with and without the investment can be equal only at a positive discount rate.

Ehrlich expanded the Becker model (see section 1.2) to include the impact of education on criminal choice. The focus was on economically motivated crimes (the property crimes of robbery, burglary, larceny, and auto theft) and attempted to determine whether education, broadly defined to include legitimate training, had a systematic effect on the incentive to participate in unlawful activities. Given the probability of apprehension and punishment and the length of the time served in prison, six propositions were presented.

1. Those with a lower level of schooling and training, i.e., those with potential legal income well below the average, would have a relatively large wage differential in crimes against property and a relatively low opportunity cost of imprisonment and thus a relatively strong incentive to "enter" crimes against property. . . . they would also tend to spend more time at, or to "specialize in, illegitimate activities relative to other offenders. In contrast, those with higher education- in particular, those with specific legitimate training- would have less incentive to participate in such crimes.

2. Offenders committing crimes against property would tend to enter criminal activity at a relatively young age, essentially because lack of schooling and legitimate training are not important obstacles to such activities and because legitimate earnings opportunities . . . may generally fall short of their potential illegitimate payoffs. Moreover, since entry of the very young into the legitimate labor force is restricted . . . their entry into criminal activity may frequently precede entry into legitimate activity.

> 3. Those in school would have less incentive to participate in crime relative to those not enrolled since many of them specialize voluntarily in acquiring education . . . school attendance . . . leaves them with less time for the pursuit of all market activities- legitimate as well as illegitimate. Proposition 2 therefore applies, in particular, to youths not enrolled in school.
>
> In contrast to index crimes against property, payoffs on crimes such as fraud, forgery, embezzlement, trade in illegal merchandise, and illegal commercial practices may depend on education and legitimate training in much the same way that legitimate earnings do. Consequently:
>
> 4. The average educational attainment of offenders engaged in this class of crimes can be expected to be higher than that of offenders engaged in property crimes.
>
> 5. The typical age of entry into such crimes would be higher because entry would follow a longer period of specialization in schooling.
>
> . . .
>
> 6. . . . one may expect the average educational attainments of nonwhite offenders to exceed those of whites in many illegitimate activities.[20]

However, as critics have noted (see above), these determinate conclusions result from the use of several special assumptions, including a positive wealth effect. A priori predictions about the impact of prison vocational training and education are further complicated by the fact that the vocational training skills taught in prison affect productivity and risks in both lawful and unlawful market and nonmarket activities.

The vocational training provided in Michigan prisons is aimed at training inmates in entry level skills in a variety of occupations. All of these skills taught in the prison vocational schools could be used either directly in committing a crime, or indirectly as the basis for being

hired in a job with opportunities for criminal activities. This training is, therefore, primarily general education, and its use is not specific to lawful employment.

Avio[21] suggests that prison vocational training may be viewed as "positive" when it increases an inmate's productivity in legitimate activities and thereby encourages lawful employment, or "negative" when it increases his productivity in illegitimate activities and thereby encourages unlawful activities. "Negative" training occurs through two effects: the "technological diffusion" effect, which raises productivity through the acquisition of knowledge useful in criminal activities, and the "production complements" effect, which provides the ex-offender with an increased pool of criminal contacts to draw upon in future criminal activity.

The overall effect of vocational training depends on the relative balance between its positive and negative aspects. Since the positive and negative aspects compete for the available time and mental energy of the inmate, any increase in the quantity and/or quality of the positive training should reduce the impact of the negative training. Other things being given, it could be expected that enrollment in longer and more intensive vocational training programs, such as electronics technician, in two or more programs, or in programs teaching skills in rapidly growing demand or with relatively high entry level wages would have a greater positive effect than enrollment in one shorter and less intensive program, such as building custodian

training, or in programs teaching skills for which employer demand is stable or declining or with relatively low entry level wages. However, enrollment in a longer, more intensive course or two or more programs implies a relatively long period of incarceration with training provided toward the end of the time spent in prison, with the result that the training program may have to overcome criminalizing effects of the pre-training period.

The consequence of providing vocational training programs which are general education is that two sets of forces are in operation for the vocational trainees. Lawful activities are encouraged by the possibility of earning a higher legal wage, the expectation of a large f_i if convicted of a subsequent offense, and the disutility expected by some inmates if more time is spent in prison. A post-release income greater than the inmate's pre-prison income, after adjustment for inflation, would suggest that training did encourage legitimate employment. In contrast, the return to criminal activity is encouraged by five factors. First, some offenders experience depreciation of their lawful, as well as unlawful, skills while in prison. This is illustrated in Figure 1.2.[22] If an inmate is incarcerated at time T^1 and released at time T^2, his stock of lawful skills depreciates by the amount ab, and then increases along h_1 when he returns to legitimate employment and stays in the labor force T years. However, if he pursues criminal employment after his release from prison, his lawful skills will

continue to depreciate along h_2 if no additional skills are acquired. The depreciation ab can be observed in a post-release income lower than the inmate's pre-prison income, after adjustments for inflation.

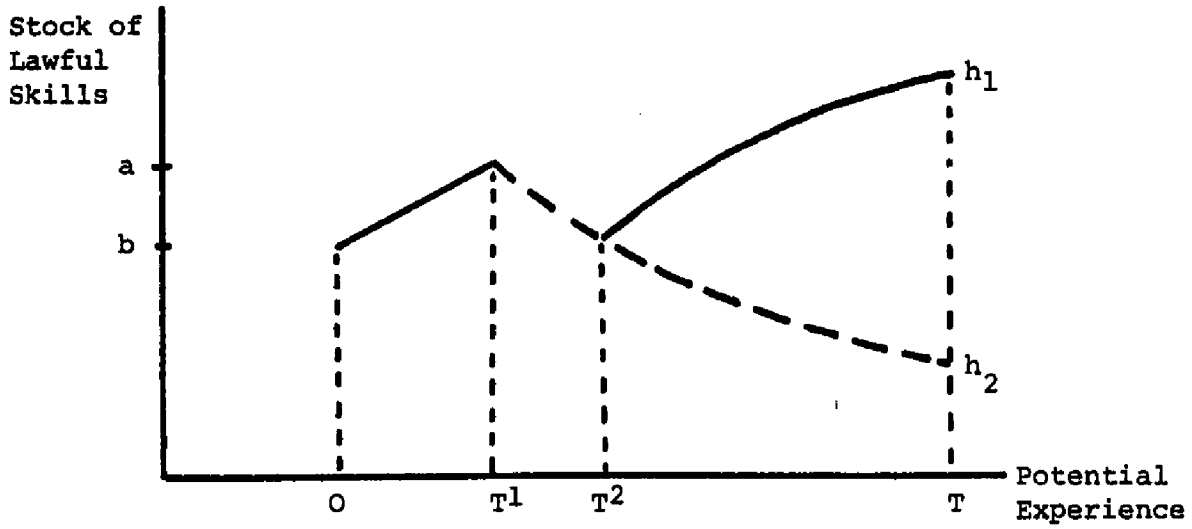


Figure 1.2. The Impact of Prison and Employment on Lawful Skills

Second, the prison experience may decrease the expected disutility of spending more time in prison. Third, the "negative" training could provide the skills necessary to become a "professional" in a particular criminal skill and to employ self-protection techniques effectively to minimize the risk of being caught. As a consequence of upgrading his skills in unlawful activities, the specialist may be under-represented among the recidivists, while the occasional and less-skilled criminal may be over-represented.[23] Fourth, the effects of vocational training may vary with the offender subgroup and type of crime. Finally, the human capital model implies that there is no difficulty in finding

employment after receiving vocational training. However, many employers do not want to hire ex-offenders. This decreases the opportunities for steady employment and forces many released offenders into the secondary labor markets. Therefore even with the possession of a vocational skill and the lack of any systematic preference for crime, the ex-offender may only be able to maximize his utility by returning to crime.[24]

1.4 Conclusion: Vocational Training and Criminal Careers

The newly released offender faces the choice of pursuing a criminal career, legitimate employment, or some combination of the two types of market activities. Human capital theory suggests that vocational training provided while in prison can have the effect of raising post-prison legitimate earnings, providing more stable employment, and thereby discouraging unlawful activities. However, since the training provided in most prisons is general education, it can raise both the post-prison legitimate and illegitimate wage since it teaches skills that can be used in lawful as well as unlawful employment. Consequently, the measured impact of training on post-prison income and recidivism will at best provide a rough guide to the effectiveness of the investment in institutional training programs in prisons.

APPENDIX

THE IMPACT OF PRE-PRISON AND PRISON EXPERIENCE CHARACTERISTICS ON POST-PRISON CRIMINAL ACTIVITIES

1.5 Introduction

An analysis of the impact of vocational training on inmate trainees must include two additional sets of variables which control for non-experimental variations between the trainees and controls: pre-prison characteristics, and prison experience characteristics. The appropriate combination of these characteristics for each individual helps explain why some men return to criminal activity while others "go straight" after their release from prison.

1.6 The Impact of the Pre-Prison Characteristics

The pre-prison characteristics which may be expected to encourage the pursuit of legitimate careers are greater age, being married, possession of good work habits, the presence of supportive parents in a healthy family background, relatively high levels of pre-prison education, and a limited commitment to a criminal career. In contrast the pre-prison characteristics which may be expected to encourage the continuation of a criminal career include youthfulness, being single, personal problems, such as drug abuse, which interfere with work habits, the lack of supportive family ties, low levels of pre-prison education, and a long term commitment to criminality.

activity may change over time as the risks of a criminal career become more apparent, such as the greater probability of receiving some punishment as an adult as compared with a man's juvenile experience, and the disutility of spending further time in prison increases. It should be noted that this change in preferences may be independent of any change in lawful and unlawful earnings. In addition, employers desiring a stable work force may avoid hiring relatively young workers, especially teenagers. Consequently, as an individual matures he may become more attractive to employers. This provides a man with greater access to legitimate jobs and perhaps better legitimate earnings, and thereby reduces the need for unlawful employment. Finally, as a man matures he may recognize the value of good work habits and be willing to work at the development of habits which will make him a more attractive employee to lawful employers.[26]

The married ex-offender, unlike the single man, has accepted a number of responsibilities and commitments, and knows that future incarcerations will affect close family

members in addition to himself. The knowledge of the harm which may be done to others, as well as their need for his support, may encourage a man to pursue lawful employment. In addition two other factors may be operative. A marriage which survives a man's imprisonment can provide the incentive for a man to remain more isolated from other inmates while in prison. As a consequence the prison term provides fewer opportunities to learn skills and develop personal contacts which might aid criminal activities after release.[27] Alternatively, an employed wife can provide financial assistance during the initial post-release period. This financial contribution may reduce the economic pressure to return to unlawful activities in order to support a family, as well as providing the resources necessary for a longer job search to locate employment with better pay and/or more stable employment.

The personal stability and maturity of a man are reflected in his work habits. "Regularity of prior employment is more closely related than type of work previously performed to the postrelease success of prisoners in avoiding further felonies."[28] Personal problems, such as psychiatric problems or drug or alcohol abuse, may be expected to interfere with employee dependability and job performance. Drug abuse in particular causes many problems when a man is supporting an expensive habit such as heroin addiction. An addict is often incapable of attending work regularly and demonstrating good work habits, and the wages earned typically are not large enough to support a habit. However,

unlawful activities with large returns can support an expensive drug habit, and require only sporadic employment.

The family background affects the criminal career in two ways. It influences the age at which the criminal career begins. A broken home or unhappy family life is frequently found in the backgrounds of many juvenile delinquents. Conflict between parents and their children may be a stimulus to criminal activity.

> Many adolescent criminals express a rebelliousness toward parents or other authority figures, and some retain these emotions in their adult years. Some crimes are committed to spite, embarrass, injure, or simply to achieve independence from a person against whom hate, jealousy, or resentment of domination is felt.[29]

Under these conditions it is difficult for the family to exert anticriminal influences, such as encouraging the completion of high school, and may create conditions which cause an adolescent to leave home at an early age. "The earlier an offender of any age left home, the more likely he is to continue in crime."[30] In addition, since many men newly released from prison must rely on their families for financial and other assistance, the quality of the relationship with his parents will affect the extent and duration of the assistance, and the relative ease or difficulty of the transitional process as well. If the relationship with the family is poor and little or no assistance is provided, economic necessity may encourage an individual to pursue unlawful activities, such as property theft, to earn money quickly.

Profiles of individuals by age and earnings have shown that higher levels of education are rewarded by higher wages, and more stable employment can also be expected. Consequently higher levels of education completed prior to incarceration may deter most types of crime by providing superior lawful work opportunities. However, this education may also enable a man to become a more proficient criminal or to pursue the more skilled and better paying crimes such as fraud or embezzlement. Therefore it is not obvious that once arrested and incarcerated, a better educated man is less likely to recidivate. However, education may be less of a deterrent to continued criminal activities for the relatively young[31] as compared with older groups due to the more limited access to legitimate job opportunities by the young.

Numerous studies have shown that one of the best indicators of a man's commitment to a criminal career is the extent of his prior criminal record. This commitment may be gauged in several ways, including the age at which his recorded criminal career began, the number of previous jail and prison terms served or the amount of time spent incarcerated, the number of terms on probation for misdemeanors or felonies, and whether the crime was economically motivated. The younger the age at which the criminal career began, the more extensive the criminal record can be. "For prisoners of any age, it generally is the case that . . . the younger a prisoner was when first arrested, convicted,

or confined for any crime, the more likely he is to continue in crime."[32] Given the difficulties faced by teenagers in finding legitimate employment, the relatively low wages in legitimate jobs available to them, and the low probability of incarceration for juveniles, crime does pay for many juvenile delinquents.

The presence of an extensive criminal record is indicative of preferences for unlawful activities and a relatively large allocation of time devoted to them. Consequently this deters a man from developing the skills and work experience which would create better legitimate employment opportunities. Under these circumstances it is not surprising that the highest rates of recidivism are found among men who commit economically motivated offenses against property as compared with men who commit offenses against people.[33]

1.7 The Impact of Prison Experience Characteristics

The prison experience characteristics include the length of time served, changes in the prison population during the year released, the year committed and released, the unemployment rate when released, and the number of new sentences received while in prison.[34] The effect of all of these characteristics except the last one on the decision about "going straight" or returning to crime is ambiguous. However, the number of new sentences received while in prison is another measure of the extent of the commitment to a criminal career (see above), and also may be an

indicator of personal problems which might hinder adjustment to regular employment after release.

The ambiguity of the impact of the length of the sentence served results from two sets of forces working in opposition to each other. On the one hand, the longer the sentence, the greater the potential for a prison to serve as a "factory for crime." However, on the other hand, more time is available for rehabilitative programs, such as extensive education and vocational training.

The year committed may affect the probabilities of being placed in rehabilitative programs, while the changes in the prison population during the year released and the year released influence the release of high risk parolees as well as the economic conditions that will constrain legitimate job opportunities. There is some evidence to suggest that the parole board tries to keep prison populations at some equilibrium level necessary for efficient management to ensure that jobs filled by inmate labor are manned and available facilities employed.[35] Large changes in the prison population do affect parole policy and the ability to provide rehabilitative services to inmates; the parole board becomes a type of safety valve. Decreases in the prison population make it easier to reach a larger percentage of men with education and training programs, but the requirements for parole may also be stiffened. Increases in the population strain the institutional facilities. This may lead to more creaming of men enrolled in vocational

programs, lengthen the waiting period for enrollment in all education and training programs, and encourage the parole board to reduce the requirements for parole, thereby placing higher risk men on parole. It should also be noted that the direction of change of the economy seems to be roughly correlated with the change in the prison population: when the economy is expanding and the Michigan civilian unemployment rate is falling, there is a negative percentage change in the prison population, while rising unemployment associated with a sluggish economy is associated with positive percentage changes in the prison population.

The expected impact of the unemployment rate is unclear. Two views have emerged. In his study of two types of property crime, car theft and bank robbery and bank burglary, Gould suggests that abundance (one measure of which may be the rate of growth of the real GNP) increases the availability of property, and that this would be followed by increases in the rate of theft of property. Conversely, decreases in the availability of property would be followed by decreases in crime rates.[36] However, this explanation is based on aggregate data from 1921 through 1965 and therefore is a long run perspective. In contrast, several studies have focused on relatively short periods of time and concluded that crime against property is correlated with the level of unemployment but the direction of the correlation varies with age. Glaser states: "One would expect relatively high crime rates for juveniles and low

rates for adults during wartime and postwar prosperity."[37] Fleisher's work supports the positive relationship between the rate of unemployment and property theft for young people ages 16 to 24.

> Since acts of delinquency may be viewed as alternatives to legitimate allocations of time, one expects to find the frequency of such acts negatively correlated with opportunities for legitimate activity among young people. [such as] . . . attending school, working in legitimate occupations, and enjoying leisure time without violating criminal codes. When unemployment rates are high, not only is it especially difficult for new entrants in the labor force to find legitimate means for satisfying the desire to acquire market goods and to secure a foothold in a trade or occupation, but it is also more difficult for families to provide market goods and services for their young.[38]

1.8 Conclusion: Pre-Prison and Prison Experience Characteristics and Criminal Careers

In addition to the rehabilitative programs in education and vocational training provided in prison, the pre-prison and prison experience characteristics of ex-offenders help explain their choice of lawful or unlawful employment after their release from prison. However, it is difficult to predict a priori the impact of many of these characteristics on this decision because their influence is not specific to either lawful or unlawful activities. However, three characteristics have consistently been shown in empirical studies to discourage continued criminal activities: greater age, being married, and a limited prior criminal record.

FOOTNOTES

1. William E. Cobb, "Theft and the Two Hypotheses," (in Simon Rottenberg, ed., The Economics of Crime and Punishment, Wash., D.C.: American Enterprise Institute, 1973), p. 19.

2. Daniel Glaser, The Effectiveness of a Prison and Parole System, (Indianapolis: Bobbs-Merrill Co., 1964), pp. 57-58.

3. For example, the Abt study collected data three and six months after the release from prison, while a California study of vocational training provided a follow-up after six months and one year. See respectively U.S. Department of Labor, Manpower Administration, An Evaluation of the Training Provided in Correctional Institutions Under the Manpower Development and Training Act, Section 251, Vol. I, II, III (Prepared by Abt Associates Inc., March 1971); and California Department of Corrections, Research Division, Research Report No. 40: A Study of Vocational Training in the California Department of Corrections, (Prepared by Robert M. Dickover et al., Jan. 1971).

4. See U.S. Department of Labor, op. cit.

5. See U.S. Department of Labor, Manpower Administration, A Review of Manpower R & D Projects in the Correctional Field (1963-1973) (Manpower Research Monograph No. 28. Prepared by Roberta Rovner-Pieczenik, 1973).

6. Gary S. Becker, "Crime and Punishmenr: An Economic Approach," Journal of Political Economy 76:2 (March, 1968), pp. 169-217.

7. For example, see Becker, Ibid., p. 178, and Gregory Krohm, "The Pecuniary Incentives of Property Crime"(in Simon Rottenberg, ed., The Economics of Crime and Punishment, Wash., D.C.: American Enterprise Institute, 1973), p. 34.

8. Isaac Ehrlich, "Participation in Illegitimate Activities: An Economic Analysis," (in Gary S. Becker and William M. Landes, ed., Essays in the Economics of Crime and Punishment, New York: National Bureau of Economic Research, 1974).

9. Block and Lind demonstrated two limitations of the Becker-Ehrlich model. 1) They showed that a monetary equivalent for a prison term may not exist. See M. K. Block and R. C. Lind, "Crime and Punishment Reconsidered,"

Journal of Legal Studies 4 (Jan., 1975), pp. 241-247. 2) They indicated that risk preference is not a necessary condition for the relatively larger deterrent effect for increased probability of punishment as compared with the severity of punishment. See M. K. Block and R. C. Lind, "An Economic Analysis of Crimes Punishable by Imprisonment," Journal of Legal Studies 4 (June, 1975), pp. 479-92.

10. M. K. Block and J. M. Heineke, "A Labor Theoretic Analysis of the Criminal Choice," American Economic Review 65:3 (June, 1975), pp. 314-325.

11. 88% of all postrelease jobs held by ex-offenders are skilled and semiskilled machine tending factory jobs, warehouse and storeroom work, service work, unskilled heavy labor, and menial or odd jobs. These jobs are characterized by relatively low pay, little opportunity for advancement, and unstable employment. See Glaser, op. cit., pp. 330-331. Similar results are presented in George A. Pownall, Employment Problems of Released Prisoners (Wash., D.C.: U.S.D.O.L., M.A., 1969), Ch. 6.

    Ex-offenders have higher rates of unemployment than the rest of the labor force, with the highest unemployment found among the non-whites, those under 24 or over 45, those with little work experience and/or skill, and those incarcerated for crimes with high rates of recidivism, such as burglary and larceny. However, these high unemployment rates reflect frequent short periods of unemployment due to job changes in high turnover jobs rather than unemployment of long duration. The usual shortage of human capital among ex-offenders tends to keep them in relatively unattractive, high turnover jobs. In addition, licensing and bonding requirements limit the jobs available to ex-offenders. See Pownall, op. cit., pp. 9-11.

12. Glaser, op. cit., p. 351.

13. Ibid., p. 361.

14. Edmund S. Phelps, "The Statistical Theory of Racism and Sexism," American Economic Review 62:4 (Sept., 1972), pp. 659-661.

15. Glaser, op. cit., (abridged ed.), p. 187. He feels that this is particularly the case for inmates educated beyond the ninth-grade level in prison. It may be that education in prison is useful only when there is a long involvement in a formal learning process. Schnur indicates that a reduction of recidivism occurs only after men are enrolled in school for six months or

more. See Alfred C. Schnur, "The Educational Treatment of Prisoners and Recidivism," The American Journal of Sociology 54:2 (Sept., 1948), p. 146.

16. Jacob Mincer, Schooling, Experience, and Earnings (New York: National Bureau of Economic Research, 1974). Empirical research has supported Mincer's theory. See Roger L. Bowlby and William R. Shriver, "Nonwage Benefits of Vocational Training: Employability and Mobility," Industrial and Labor Relations Review 23:4 (July, 1970), pp. 500-509, and Adgar B. Carroll and Loren A. Ihnen, "Cost and Returns for Two years of Post-Secondary Technical Schooling: A Pilot Study," Journal of Political Economy 75:6 (Dec., 1967), pp. 862-873, as examples of studies showing higher earnings for persons who received post-secondary vocational training as compared with high school graduates. Jacob Kaufman et al., A Cost Effectiveness Study of Vocational Education: A Comparison of Vocational and Nonvocational Education in Secondary Schools (University Park, Penn.: Institute for Research on Human Resources, The Pennsylvania State University, March 1969) apply the theory at only the secondary level to determine the returns to vocational education. None of the studies cited, however, focuses on the ex-offender population.

17. The Department of Corrections states that enrollment in vocational training programs will only influence a parole board favorably when other personal characteristics and circumstances suggest that the inmate is a good parole risk. A more important consideration is the promise of a job upon release.

18. The desire to learn a trade in order to improve post-release employment prospects was most often chosen by inmates as a major interest while in prison. See Glaser, op. cit., p. 265.

19. The investment in human capital is analogous to any other type of investment: an investor will select a particular investment only if he thinks that it will improve his earnings. However, for an investment in training, the return is in the form of a price change to the investor (he can sell his labor services at a higher price) rather than in an asset change. Therefore, the correct measure of his return is the wealth effect of the price change. The use of earnings ignores the fact that leisure has become more expensive, so the difference in net earnings resulting from investment systematically overstates the value of the return. The bias should be positively related to the level of investment and the cost of the training. However, since there is no externally observable measure of the real return to investment in human capital,

human capitalist are generally agreed that the most appropriate measure is earnings discounted through time. See C.M. Lindsay, "measuring Human Capital Returns," Journal of Political Economy 79:6 (Nov./Dec., 1971), pp. 1195-1215.

20. Isaac Ehrlich, "On the Relation Between Education and Crime," (in F. Thomas Juster, ed., Education, Income and Human Behavior, New York: McGraw-Hill Book Co., 1975), pp. 321-322.

21. Kenneth L. Avio, "An Economic Analysis of Criminal Corrections: The Canadian Case," Canadian Journal of Economics 6:2 (May, 1973), pp. 166-167.

22. George E. Johnson and Frank P. Stafford, "The Earnings and Promotion of Women Faculty," American Economic Review 64:6 (Dec., 1974), pp. 889-890. In the case of illegal skills, the pattern of depreciation would be the same: the skills would depreciate while in prison and after release if legal activities were pursued, and the skills would increase if illegal activities were pursued after release. However, the effects of this depreciation cannot be observed since only legal earnings data are available.

23. Ehrlich, op. cit., p. 318.

24. Ibid., p. 319.

25. Daniel Glaser, Personal Characteristics and Parole Outcome (National Parole Institutes, Wash., D.C.: U.S.H.E.W., Welfare Adm., Office of Juvenile Delinquency and Youth Development, U.S.G.P.O., 1966) p. 5.

26. A survey of ex-offenders who succeded in pursuing a conventional life employed in legitimate employment suggested that "Their eventual success reflected useful work skills, education, or habits of diligence and perseverance, which most of them acquired for the first time in their lives during long prison terms." See Glaser, The Effectiveness of a Prison and Parole System, op. cit., (abridged ed.), p. 34.

27. See Jan Palmer, An Economic Analysis of Sentencing and Recidivism in the Michigan Criminal Justice System. Unpublished dissertation, Michigan State University, E. Lansing, Mich., 1974., and Philip Cook, "The Effect of Legitimate Opportunities on the Probability of Parolee Recidivism," (Working Paper, Institute of Policy Sciences and Public Affairs, Duke University, Durham, N. Carolina).

28. Glaser, op. cit., p. 233.

29. Daniel Glaser, Adult Crime and Social Policy (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1972), p. 21.

30. Glaser, The Effectiveness of a Prison and Parole System, op. cit., p. 40.

31. Cook, op. cit., p. 37.

32. Glaser, op. cit., p. 37.

33. Ibid., p. 44. A more recent study ". . . finds that higher wages seem most effective in deterring crime for non-serious income offenders and appear if anything to increase crime for serious income offenders." See Ann Dryden Witte, "Estimating the Economic Model of Crime with Individual Data," (Working Paper #77-6, Department of Economics, University of North Carolina, Chapel Hill, N. C., July, 1977), p. 22.

34. A man may receive a new sentence while in prison for two reasons: he commits a crime while in prison, such as drug dealing or assault, or a crime committed before incarceration may be prosecuted after incarceration.

35. Keith Hawkins, "Some Consequences of a Parole System for Prison Management," (in The Future of Parole: Commentaries on Systems in Britain and the U.S.A., D. J. West, ed. London: Gerald Duckworth & Co., Ltd., 1972), p. 113.

36. Leroy C. Gould, "The Changing Structure of Property Crime in an Affluent Society," (in Deviant Behavior and Social Process, William A. Rushing, ed. 2nd ed. USA: Rand McNally Publishing Co., 1975), pp. 102-110.

37. Glaser, op. cit., (abridged ed.), p. 7.

38. Belton M. Fleisher, "The Effect of Unemployment on Juvenile Delinquency," Journal of Political Economy 71:6 (Dec., 1963), p. 548.

CHAPTER 2

DATA SOURCES AND SAMPLE SELECTION

2.1 Introduction

The study focused on male prison inmates aged 17 to 54 at the time of sentencing who were released from three Michigan prisons from January, 1969 through December, 1973. The three prisons were the State Prison of Southern Michigan in Jackson (SPSM), the Michigan Training Unit in Ionia (MTU), and the Michigan Reformatory in Ionia (MR).[1] The data for the study were collected from two major sources: the Michigan Department of Corrections, and the Social Security Administration (SSA). The inmates were examined in two groups: those who were enrolled during their incarceration in vocational training programs (the trainees), and those matched to the trainees but who had not been enrolled in vocational training programs while in prison (the controls).

2.2 Data Sources

Four sets of data were made available by the Michigan Department of Corrections. The computerized "Transactions Tape" provided a composite record of all transactions, such as movements between prisons, prison assignment, arrest, parole, and other information identifying the exact position of an individual within the corrections system, for the years 1968 through 1974. This information

was used to identify the inmates released from January, 1969 through December, 1973, and to trace the recidivism of the selected sample. Any recidivism occurring outside of Michigan could not be traced unless the man was returned to Michigan. The computerized "Master Tape" provided additional information about the corrections records and personal characteristics of inmates incarcerated from 1969 through 1974. These demographic variables were used in the factor analysis on which the matching of the trainee and control groups was based, and in the recidivism and human capital regressions (see Chapters 4 and 5). In addition, each prison's academic and vocational school furnished files containing the academic education and vocational training records of those inmates who had been enrolled in school or vocational training while in prison. Interviews with the school and Department of Corrections staff provided additional information about the programs. Missing data from the Master Tape were replaced with the mean value of the available data, while missing school file information was estimated using the available data. Finally, the annual financial reports of the Department of Corrections provided data on prison confinement and training costs.

Due to the ex post facto research design, very little data quality control was possible. In particular, the reliability of the data on pre-prison characteristics and the prison educational record is questionable for two reasons. Most of the personal and family background information was

collected during an interview with each inmate at the time he was committed to prison, and little is done to check the truthfulness of the information collected. In addition, the data about enrollment in educational and training programs while in prison were collected from school files which were maintained by inmate clerks at the SPSM and MR during the period studied; only the records at the MTU were kept by the staff. As a consequence, a SPSM or MR resident unwilling to, or incapable of, achieving an educational goal considered desirable to speed up consideration for parole could have paid the inmate clerks to include incorrect information in their file. An example would be recording the completion of a training program when no completion occurred.

The Social Security Administration added income data from its Lifetime Earnings Record File for the estimation of the correlation matrix for the human capital regressions (see Chapter 5). The Social Security file contains the quarterly wage and salary data from employers and annual self-employment reports filed with federal income tax returns; no information is provided on hours worked or occupation. The quarterly nonfarm wage data is 98% complete within the first ten months after the end of the year in which the wages are paid, and annually reported farm wages are 90% complete during the same time period. The records of the self-employed are 95% complete within one year after the reporting year. Consequently, the data through 1974 were relatively complete for this study.

Gross Earnings are reported to the SSA up to the prescribed limits indicated in Table 2.1. However, since the study focused on low wage workers and the income ceiling rose rapidly during most of the period studied, these limits

Table 2.1. Taxable Maximum Earnings Reported to the Social Security Administration, by year

Year	Taxable Maximum per Employer	Year	Taxable Maximum per Employer
1951-54	$ 3,600	1968-71	$ 7,800
1955-58	4,200	1972	9,000
1959-65	4,800	1973	10,800
1966-67	6,600	1974	13,200

did not constitute a critical deficiency (see section 3.4). The data cannot provide information about any unlawful income which may have been earned.

The Lifetime Earnings Record covers about 90% of the paid stable employment of the type desired for vocational trainees. Non-covered employees include most federal civilian employees, employees of state and local government which have not been covered by Federal-State agreements, certain employees of exempt non-profit organizations, farm and domestic workers with earnings less than $50 a quarter, and irregular, part-time employment. We would expect that most of the sample would not fall into the first three non-covered categories, but the earnings of some individuals were lost who fell into the last two categories. The absolute amount of these earnings should not have been large, however.

2.3 Sample Selection Procedure

The selection of the sample to be studied required three steps: step one, the identification of the men released during the time period of interest; step two, the identification of the men in the sample who had participated in a vocational training program while in prison; and step three, the matching of the men who had taken a vocational training course (the trainees) with men with similar pre-prison characteristics who had not received vocational training (the controls).

The objective in step one was to identify the men released from the three prisons during the period from January, 1969 through December, 1973. Seven types of releases were expected: 1) sentence reversed by appeal and discharged; 2) sentence reduced to a misdemeanor; 3) discharged by the court, Nolle Prose Qui (no case found); 4) pardon; 5) discharged on the maximum without parole; 6) court resentenced to probation; and 7) first parole.[2] The first and fourth types of release yielded no sample points; 81% of the releases were first paroles. The total number of men identified was 4379;[3] 93% of them were released from the SPSM (see Table 2.2).

The identification of the trainees was accomplished by reviewing the educational files of the men released during the specified time period. It was found that 582 men had been enrolled in seventeen vocational programs. Three types of enrollment were found. Some men were enrolled in

Table 2.2. Inmates Released from 1969 through 1973 from the SPSM, MR, MTU, by Type of Release

Type of Release	Institution			
	SPSM	MR	MTU	Total
Sentence reduced to misdemeanor	8	1	0	9
Discharged by court, Nolle Prose Qui	27	5	0	32
Discharged on maximum without parole	623	85	45	753
Court resentenced to probation	8	2	4	14
First parole	3384	12	175	3571
Total*	4052	104	223	4379

* Two inmates were released after serving two sentences during the period specified. They were included in the table on the basis of the earlier release date.

the vocational trade programs to learn a skill and were not interested in earning high school credit. Others were enrolled in high school and were taking vocational courses to earn credits for graduation. In addition, men were enrolled by law in remedial courses when they tested at a sixth grade or lower reading level and enrolled in a vocational program as well. This latter group usually studied custodian training or cooking and/or baking.

Two difficulties were encountered while selecting the trainees. It was found that some men enrolled in vocational courses and dropped out after a few days. Furthermore, some men stayed in the vocational programs for several weeks and were dropped by request of the instructor due to lack of motivation, inadequate preparation, attitude, high absenteeism, disciplinary confinements, and other reasons. In both of these cases, it seemed unlikely that the vocational program had much of an impact on the inmate. Therefore, due to these special enrollment features, it was necessary to establish criteria to select the trainees. Consequently, a man was treated as a trainee if: he was enrolled for at least four weeks in the long vocational programs such as vocational music and electricity/electronics; he was enrolled for at least three weeks in the short vocational programs such as custodian training; the training was provided in a structured classroom situation, i.e., cell study and non-credit courses were excluded; and at least one enrollment date was available (either the starting or ending date)

along with some information about the degree of accomplishment in the program.

In addition to the general criteria given above, three vocational programs required special selection procedures. The electricity/electronics program entailed six courses designed for 2½ to 4 months each. A trainee in this program had to complete at least the first course. The vocational business and music programs were academic programs rather than trade programs. Many high school students took occasional business or music courses but could not be considered as enrolled in the courses to learn marketable vocational skills. Consequently it was necessary to establish a proxy for serious commitment to these programs. The criterion used was enrollment in a minimum of three music courses for the vocational music program and three business courses for the vocational business program. This is roughly equivalent to being enrolled in a half-day trade program.

Approximately 18% of those identified as possible trainees were eliminated by the screening, and were returned to the inmate pool from which the controls were selected. The trainee group was further reduced to 386 because thirteen men died shortly after their release so that no follow-up was possible, and 76 men did not have social security numbers, thereby preventing any collection of income data for this group.

The men who died were relatively young: 62% were twenty-nine or younger. Eleven died on parole and two

during subsequent incarcerations. Twelve were released from the SPSM and one from MTU. They were enrolled in ten vocational programs: ten men were enrolled in one program and three men were enrolled in two programs while in prison.

As shown in Table 2.3, the trainees without SSA numbers (Group 1) primarily differed from those with SSA numbers (Group 2) due to Group 1 containing more non-whites and men who were relatively young at incarceration and release. These personal characteristics suggest that Group 1 would have less work experience and therefore would not have acquired a SSA number. However, despite the differences in personal characteristics, the two groups did not differ appreciably in their percentage distributions in the vocational training program categories[4] in Table 2.4. The omission of the men without SSA numbers, as well as the men who died, removed a low wage and relatively recidivistic group from the sample. This would somewhat bias the estimates of recidivism downward, and of post release income, upward.

2.4 Objectives of the Matching Procedure

The objective of the matching procedure was to create an ex post facto quasi-experimental design which would facilitate the comparison of the vocational trainees with a control group[5] in a time series study.[6] In order to achieve this objective, two constraints were imposed on the control selection procedure. First, the technique employed should match the trainee and control groups as closely as

Table 2.3. Pre-Prison Personal Characteristics of Trainees, in percentages

Characteristics	Trainees Without SSA Numbers: Group 1	Trainee With SSA Numbers Group 2
Age when incarcerated		
17-19	29	13
20-24	34	36
25-29	13	21
30-34	16	13
35-39	5	9
40 & over	3	8
Age when released[a]		
17-19	11	3
20-24	34	27
25-29	26	32
30-34	17	17
35-39	4	9
40 & over	8	13
White	36	51
Single, divorced, or separated	86	78
No dependents	83	69
Unskilled occupation[b]	97	85
Age 16 or under at first attention of authorities	66	54
Some juvenile corrections history	49	37

[a] The totals may not equal 100% due to rounding.

[b] Skilled occupations include the codes for farmer, skilled trade, own business, professional, clerk, business management, office work, and sales. Unskilled occupations include the codes for no occupation, common labor, farm labor, housewife, domestic, student, and habitual criminal.

Table 2.4. All Trainees, by Vocational Program and Institution

Vocational Programs	Trainees Without SSA Numbers (Group 1)					Trainees With SSA Numbers (Group 2)[a]				
	Institutions					Institutions				
	SPSM	MR	MTU	Total	%	SPSM	MR	MTU	Total	%
PROFESSIONAL, TECHNICAL, & KINDRED WORKERS	13	0	12	25	28	86	0	30	116	26
Computer Programming	1	0	3	4		0	0	6	6	
Data Processing	0	0	4	4		7	0	13	20	
Electricity/Electronics	5	0	0	5		54	0	0	54	
Machine Drafting	5	0	5	10		0	0	11	11	
Vocational Music	2	0	0	2		25	0	0	25	
CLERICAL WORKERS										
Vocational Business	3	0	0	3	3	13	0	0	13	3
CRAFTSMEN & KINDRED WORKERS	12	6	5	23	26	70	12	30	112	25
Auto Body Reconditioning	0	0	3	3		0	3	13	16	
Auto Mechanics	6	2	2	10		36	5	4	45	
Building Trades[b]	0	3	0	3		1	0	0	1	
Heating & Air Conditioning	0	0	0	0		0	0	4	4	
Machine Shop	6	1	0	7		32	4	9	45	
Typewriter Repair	0	0	0	0		1	0	0	1	
OPERATIVES	18	3	1	22	25	80	8	11	99	22
Vocational Graphics (Printing)	1	1	0	2		0	1	0	1	
Welding	17	2	1	20		80	7	11	98	
SERVICE WORKERS	16	0	0	16	18	103	1	0	104	23
Food Services (Cooking &/or Baking)	3	0	0	3		32	0	0	32	
Custodian Training	13	0	0	13		71	0	0	71	
Barbering	0	0	0	0		0	1	0	1	
TOTAL	62	9	18	89	100	352	21	71	444	100

[a] There were 386 trainees in Group 2. 334 were enrolled in one vocational program; 46, in two programs; and six men at the SPSM were enrolled in three programs. 36 of those participating in two programs were in the SPSM; four, in the MR; and six at MTU studied the two course data processing-computer programming sequence.

[b] This includes sign painting, carpentry, and bricklaying.

possible so that the observed differences in earnings and recidivism after the release from prison would reflect primarily the experiences of vocational training. Second, it was necessary to employ a technique which would prevent the loss of any trainee sample points due to the inability to find a match with a member of the control group. The experience of Bowlby and Schriver in their study of vocational training illustrates this problem. They matched in a sequential fashion on the basis of ten criteria and eliminated about 83% of their original trainee sample group.[7] The matching procedure employed to achieve the desired objectives within the imposed constraints required the estimation of a numerical score or index derived from a factor analysis of twenty-five highly correlated pre-prison characteristics for each member of the trainee group, as well as the potential members of the control group.[8] This index consequently served as a summary statement of pre-prison characteristics so that each trainee could be matched with a control with the same numerical score.

The control group chosen by this matching procedure should reduce the impact of any biases of the self-selection and trainee selection process on the analysis since the trainee and control group will resemble each other on the selected package of observed variables. Despite the correlation among the pre-prison characteristics some causes of successful post-release experiences, such as individual motivation to "go straight," may be missed in this procedure. It is impossible to gauge the extent of the bias

this may create, but this limitation would occur in any design employing two groups for comparison. However,

> To the extent that it is possible to construct subgroups of individuals who are alike on key variables that have been shown to or can be assumed to lead to similarities in the behavior of interest, then it is reasonable to believe that the matching of experimentals with controls within these subgroups should lead to the construction of equivalent experimental and control groups.[9]

The matched pairs design combined with the longitudinal follow-up on recidivism and income data will reduce or eliminate four of the problems often found in experimental designs. Since the study is being conducted on an ex post basis, the Hawthorne effect will be minimized: the trainee and control groups were not aware of being tested. Furthermore, there should be little attrition for either the trainee or control group because of the reliance on the information collected from the completed records maintained by the Social Security Administration. In addition, although inmates were tested on their educational skills prior to training, no follow-up tests were given to measure improvements, so the testing effect will not be present. Finally, the maturation effects based on comparisons of men of different age levels and history effects due to changes in economic conditions during 1969-73 should not influence the results since the trainee and control samples are matched.[10]

The use of factor analysis techniques in the matching procedure was justified in this study for three reasons. Although the control group could have been chosen by random sampling, it would not have achieved the desired

objective: to identify two groups of men who differed primarily on the presence of vocational training in their prison experience. In addition, since the trainee group was not randomly selected, it is not clear that a random selection of controls would have been appropriate. It should be noted ". . . that randomization is one of those 'long run' phenomena, and that the desired equivalence of groups will not necessarily occur in any one or even several applications."[11] Also, it was the best available method which permitted the use of a spectrum of variables reflecting demographic and personality traits in the matching procedure. Finally, there is a lack of concensus about the variables explaining successful post-release employment experiences and low recidivism rates. As a consequence, there are few reliable guidelines available in either theory or empirical work for use in choosing a limited number of variables to be used in matching.[12] However, it is well recognized that many offender characteristics are highly correlated.[13]

There are four limitations to the use of the numerical score and factor analysis as the basis for calculating the score to be used for the matching procedure. It may be possible for two men to have the same numerical score even though their pre-prison characteristics differ. Also, factor analysis is based on the rigid assumption of linearity and may distort nonlinear relationships between variables. However, since we do not know that the variables included in the analysis are non linearly related, the degree of distortion is also unknown. In addition,

principal factors are dependent on the unit of measurement used. If different units of measurement are employed, then different principal factors are calculated.[14] Factors cannot, therefore, be precisely estimated. Finally, the replacement of the main diagonal elements of the correlation matrix with communality estimates creates inferred factors which are not exact mathematical transformations of the original variables. However, since the factors estimated are not being compared to those of another sample and the units of measurement used for the included variables are the same for the trainee and control group, these latter two limitations do not create serious problems in the context in which they are employed in this study.

2.5 The Matching Procedure

The matching procedure entailed two steps. A trainee index number or numerical score was created based on a factor analysis of the trainees. This score was then employed to select a control for each trainee.

The variables entered in the trainee factor analysis are listed in Table 2.5.[15] The variables employed were of two types: quantitative measures (the number of dependents, average grade rating, number of jail and prison terms, number of terms of adult probation for misdemeanors or felonies, and age when sentenced); and qualitative measures. Those qualitative variables whose coding represented a ranking of information were used unaltered. For example, the use of alcohol was coded in ascending order as none,

Table 2.5. Pre-Prison Characteristics Used in the Factor Analysis

Variables	Factor Coefficients	
	Factor 1	Factor 2
1. Race	-.02649	.10889
2. Religious preference	-.22449	-.06150
3. IQ	.69212*	.32647
4. Education	.75949*	.16068
5. Average grade rating	.72625*	.41450*
6. Occupation	.22431	-.01174
7. Marital Status	.24892	-.19778
8. Number of Dependents	.29810	-.26043
9. Use of habit forming or addicting drug	.20267	.02304
10. Use of alcohol	.32260	.01127
11. Psychiatric Treatment History	.04277	.30003
12. Chronic physical disability	.06403	.07166
13. Work Adjustment	-.53590*	.19784
14. Mother's influence	.42487*	-.35487
15. Father's influence	.40128*	-.39882
16. Parental marriage	.41922*	-.38552
17. Parental broken home	.08009	.23893
18. Age at first attention of authorities	.58873*	-.35873
19. Juvenile Corrections history	.02633	.52911*
20. Number of jail terms	.19428	.06303
21. Number of prison terms	-.01876	.15454
22. Adult probation misdemeanor (number of terms)	.18504	.24180
23. Adult probation felony (number of terms)	.13748	.53249*
24. Total time served	.22085	.55456*
25. Age when sentenced	.19635	-.20847
26. Crime Category**	-.04180	.20181

** See Chapter 2, Footnote 19.

moderate, moderate with low tolerance, problem drinker, and chronic alcoholic. The other qualitative variables were recoded as zero-one variables.[16] All missing data were assigned the mean value of the variable.

Nine principal factors explained the total variance. The coefficients for the first two factors are given in Table 2.5. The first factor accounted for 27.5% of the total variance, and the second factor, 18.4%. The factor coefficients, factor weights, and the standardized observed values of the variables were combined to create a numerical score for each trainee and all potential controls.[17]

The trainees and controls were matched on a one-to-one basis: first, by prison; second, by the year released from prison,[18] and third, by the calculated score. Where two or more potential controls were available as matches for a single trainee, the one whose inmate number was closest to that of the trainee was selected. This method ensured that cohort effects, such as differences in prison characteristics, the state of the economy when released, and, where inmate numbers were close together, similar economic conditions at the time of first entry into the prison system, were adequately reflected.

Since members of the trainee group had served most, if not all, of their sentence in a single institution before release to a work camp just prior to parole, the records of the controls were checked to ensure the same continuity of experience in one prison. Those controls who had been

shifted between prisons and had served less than one-third of their sentence in the same prison as that of their trainee match were replaced by another control. A consequence of this treatment of the controls was that some matched pairs of inmates were not as closely matched on the basis of their numerical scores as would have been possible without this procedure.

The numerical scores of the selected sample ranged from approximately -2924 to 2107 for the men selected from the MTU; -1744 to 1886, from the MR; and -2925 to 2059, from the SPSM. The mean score of the SPSM sample of trainees and controls was approximately -24 with a standard deviation of 1034; of the MTU, 171 with a standard deviation of 760; and of the MR, -252 with a standard deviation of 515. It should be noted that a change of one in the value of any single variable included in the estimation of the numerical score would have changed the calculated score by an average of about 87.

The success of the matching procedure can be evaluated from two perspectives: the closeness of the matched numerical scores, and a comparison of the means of the variables employed in the calculation of the scores for the trainee and the control groups. The average trainee-control pair was closely matched on the basis of the numerical scores estimated, but the closeness of the match varied with the prison. Approximately 64% of the matched pairs were selected on the basis of numerical scores which differed by five or less between the trainees and controls;

and about 29%, on numerical scores which differed by one or less. 14% of the matched pairs were based on numerical scores which differed from five to ten; and 7%, from ten to twenty. The closest matches were made for the SPSM. This occurred because the size of the institution provided a large group from which to select controls. Approximately 71% of the SPSM trainees were matched with numerical scores which differed by five or less in contrast to the MTU (43%) and the MR (12%). Roughly 88% of the trainees from the SPSM were matched on numerical scores which varied by twenty or less as compared with 69% at the MTU and 70% at the MR.

A comparison of the means of the twenty-five variables used in the factor analysis (see Table 2.6) indicates that nine of the means differed significantly. The larger the differences are between the percentile distributions for the means of the trainees and controls, the more significant the differences in the means. The differences in the means of the variables measuring economic crime, number of prison terms, number of terms of adult probation for misdemeanors and felonies, protestant, and total time served were significant at the 2.5% level; for the variables measuring drug and alcohol use, at the 5% level; and for number of dependents, at the 10% level. In contrast to the results in Table 2.6, a good random sample would have generated no more than three variables whose means differed significantly at the 10% level. However, as noted above, randomization is not infallible in any single experiment, so these observed

Table 2.6. Pre-Prison Characteristics of Trainees and Controls

Variables	Trainees (%)[a]	Controls (%)[a]
1. Economic Crime[b]***	52.3	63.0
2. White	51.0	49.2
3. Protestant***	59.3	50.5
4. IQ normal or above	61.7	59.3
5. Formal education completed		
6 years or less	4.9	8.5
7 to 8 years	20.2	13.5
9 to 10 years	39.6	43.5
11 years or more	35.2	34.5
6. Average grade rating		
6 years or less	43.2	45.0
7 to 8 years	36.5	32.4
9 to 10 years	14.2	17.9
11 years or more	6.0	4.7
7. Prior occupation skilled[c]	15.0	15.0
8. Married	22.3	22.5
9. Number of dependents*		
None	68.7	74.4
1 to 3	23.0	19.7
4 or more	8.4	6.1
10. Drug use: sustained or addicted**	22.8	28.2
11. Problem drinker**	17.6	13.2
12. Some psychiatric treatment history	35.8	34.5
13. Chronically Physically disabled	18.9	17.1
14. Work adjustment: highly dependable or adequate	21.2	18.7
15. Mother's influence healthy	30.3	32.4
16. Father's influence healthy	22.5	21.5
17. Parental marriage harmonious	37.0	33.4
18. Parental home intact	45.6	42.7
19. Age at first attention of authorities		
14 and under	24.4	26.9
15-18	46.4	47.7
19 and over	29.3	25.4

Table 2.6 continued

	Trainees (%)	Controls (%)
20. Some juvenile corrections history	36.8	37.6
21. Number of jail terms		
None	43.3	46.9
One	22.0	19.7
2 or more	34.6	33.4
22. Number of prison terms***		
None	68.9	59.3
One	20.5	20.2
2 or more	10.6	20.5
23. Adult probation misdemeanor (number of terms)***		
None	52.6	64.0
One	33.4	25.9
2 or more	14.1	10.1
24. Adult probation felony (number of terms)***		
None	86.5	80.6
One	10.4	14.0
2 or more	3.1	5.5
25. Total time served***		
None	40.4	35.8
Up to one year	27.2	23.3
One year or more	32.4	40.9
26. Age when incarcerated**		
17-19	13.0	12.5
20-24	36.3	30.9
25-29	21.7	23.6
30-34	12.6	11.0
35-39	8.9	11.3
40 and up	7.7	10.7

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[a] The totals may not equal 100% due to rounding.
*** The difference in the means was significant at the 2.5% level.
** The difference in the means was significant at the 5% level.
* The difference in the means was significant at the 10% level.

[b] See Chapter 2, Footnote 19.

[c] See Table 2.3, Footnote b.

significant differences could have occurred in a random sample as well.

2.6 Conclusion

The problem confronted in this study was to create ex post facto a quasi-experimental design which would permit the comparison of two groups of ex-offenders who differed primarily due to the presence of vocational training in the prison experience of the trainee group. A technique based on an index created with the use of factor analysis was employed to match the controls to the selected trainees without the loss of any of the trainee sample points. The matching procedure did not exactly match all the trainee and control pairs, but it did succeed in achieving close matches based on numerical scores for most of the sample. Although there were more significant observed differences in the means of the pre-prison characteristics of the trainees and controls than would be expected with randomization, these differences could have occurred with use of any randomly selected control group.

FOOTNOTES

1. This study, like most studies of recidivism and vocational training, focused on male offenders since most of the resources of the Michigan Department of Corrections are devoted to male inmates. Approximately 96% of the Michigan state prison population was male in 1964 and 1973-74. The female inmate population is so small (166 on July 1, 1974) that it is housed in the Detroit House of Corrections, a facility owned and operated by the City of Detroit. The vocational programs offered are so limited that they are not reported in the annual report of the Department of Corrections. The three prisons were selected to ensure that a range of ages was included in the sample as well as to reflect differences in custodial levels and the vocational training program offerings. During the period in which the men in the sample were incarcerated younger offenders from the ages of 16 to 23 were assigned to the MR and the MTU while men 22 and older went to the SPSM. The MR is a maximum security institution; the MTU, a medium security institution; and the SPSM contains maximum and minimum security areas. Younger men with extensive criminal records are sent to the MR, where relatively few vocational programs are available. Four were offered at the MR from 1971-73. The selection of men for the MTU emphasized first offenders and others selected on the basis of adjustment potential, relatively high levels of academic skills, and the probability of success in educational programs. Ten vocational programs were offered at the MTU from 1971-73, while seven were provided at the SPSM.

2. It should be noted that some men may have been released earlier in the period studied under a different release code, such as that indicating release after a parole violation. However, this should not have created any systematic bias in the selection of the trainees and controls.

3. While the initial inmate group was being reviewed to identify the trainees, the Applications Programming office had to replace the original programmer due to staffing constraints. When the second programmer employed the program written by the first programmer to select the initial inmate group, approximately 20,000 men were identified with the desired release codes. A review of the two samples suggested that there were no systematic biases differentiating the two groups. The size differences in the two groups were apparently the result of an unimportant programming error which could not be easily remedied due to the

constraints imposed by time and money limitations. Consequently, the initial trainee group was retained and matched with controls selected from the second and larger inmate group. The result of this programming error therefore had two implications for the sample: the matched sample was smaller since only the trainees from the first inmate group were matched with controls, and the matches between the trainees and controls were probably closer since the controls were selected from a larger inmate pool.

4. The vocational training categories employed were based on the occupational definitions in the 1970 census of population in the United States.

5. A quasi-experimental design is the only alternative available when the researcher lacks full control over the experimental situation. While it is a second best approach as compared with a true experiment, such designs ". . . are believed to be sufficiently probing . . . to be well worth employing where more efficient probes are unavailable." Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-experimental Designs for Research (Chicago: Rand McNally Co., 1963), pp. 35.

6. This is basically the Multiple Time-Series Design (Design #14) discussed in Campbell and Stanley, op. cit., pp. 55-57.

7. Roger L. Bowlby and William R. Shriver, "Nonwage Benefits of Vocational Training: Employability and Mobility," Industrial and Labor Relations Review 23:4 (July, 1970), pp. 500-509.

8. An early application of factor analysis was employed in a similar fashion for the selection and classification of army personnel. The factors calculated were used to construct a profile of individuals in particular jobs in order to provide a basis of comparison with prospective employees being considered for the job. See Karl J. Holzinger and Harry H. Harman, Factor Analysis: A Synthesis of Factorial Methods (Chicago: University of Chicago Press, 1941), p. 4.

9. Clarence C. Sherwood, et al., "A Multivariate, Nonrandomized Matching Technique for Studying the Impact of Social Interventions," (in Elmer L. Struening & Marcia Guttentag, ed., Handbook of Evaluation Research V. 1, Beverly Hills, CA: Sage Publications, 1975) p. 189.

10. The Multiple Time-Series design effectively handles the problems which may threaten internal validity. See Campbell and Stanley, op. cit., p. 57.

11. Sherwood, op. cit., p. 187.

12. Age, prior criminal record, and type of crime have frequently been identified as important predictors for recidivism, but many other factors, such as the level of education, and number of dependents, have not shown a consistent impact among the groups studied. However, there often is no concensus about those variables which are important predictors for recidivism. For example, some argue that a criminal record prevents a man from being hired, others state that it may help, and Glaser asserts: "The ex-prisoners' primary barrier to employment is not his criminal record as frequently as it is his lack of extensive or skilled work experience." Daniel Glaser, The Effectiveness of a Prison and Parole System (Indianapolis: Bobbs-Merrill Co., Inc., 1964), pp. 351 and 361.

13. "For example, a man's work record, his arrest record, and his excessive use of alcohol are likely to interrelated. . . . where information on an important factor, such as alcoholism, is vague and unreliable; more objective information, such as work or arrest record, may adequately reflect the predictive significance of alcoholism. Each additional predictive factor seems generally to add a . . . decreasing amount of predictive discrimination, assuming one starts with the most predictive single item and constantly adds the most discriminating of remaining items."

    Ibid., p. 305.

14. Henri Theil, Principles of Econometrics (New York: John Wiley & Sons, Inc., 1971) p. 55.

15. The SPSS program for principal factoring with iteration (PA2) was employed to estimate the principal factors for the trainee group. The estimation procedure entailed three steps. a) The raw data were normalized as the correlation matrix was constructed. b) The main diagonal elements of the matrix were replaced with communality estimates. c) An iteration process was employed to improve the communality estimates.

    This procedure created a limited number of hypothetical variables or principal factors which are linear combinations of the observed variables. For each individual i,

$$z_{ji} = a_{j1}F_{1i} + a_{j2}F_{2i} + \ldots + a_{jn}F_{ni}$$

for the jth observed variables (z_{ji}) and the nth principal factor (F_{ni}). The coefficient a_{jn} indicates the portion of z_j explained by each principal factor. Each factor makes a maximum contribution to the sum of the variances of the observed variables, and thereby reduces the observed data to a smaller set of variables.

16. These included crime category (economic or noneconomic); race (white or nonwhite); religious preference (protestant or other); occupation (skilled or unskilled); marital status (married or other); mother's and father's influence (healthy or other); parental marriage (harmonious or other); chronic physical disability (none or other); and juvenile corrections history (none or other). The coding of education was modified to include a GED certificate and special education under the last two years of high school completed, and post graduate study was added to three to four years of college education completed.

17. The numerical score for the ith individual (S_i) was calculated using the formula:

$$S_i = 275 \sum_{j=1}^{26} a_{j1} X_{ji} + 184 \sum_{j=1}^{26} a_{j2} X_{ji}$$

where X_{ji} is the observed value of the jth variable for the ith individual standardized using the means and standard deviations of the trainees, and a_{ji} and a_{j2} are the factor coefficients for factors one and two calculated for the trainees. The weights are the percentage of the total variance explained by factors one and two, multiplied by ten.

The data used to calculate the numerical scores were taken from the Master Tape record of the trainees during the year committed and the record of the controls during the year released. This approach minimized the complications of manipulating the computer tape records and was based on the assumption that the records were not modified while a man was in prison. In theory the Department of Corrections updates these records when new information becomes available about a man's background. However, a review of a sample of records indicated that such updating is rare, and primarily involves the addition of missing data. There is no reason, therefore, to expect systematic biases to result from this assumption.

When the scores were first estimated for the potential control group it was discovered that approximately 50% of the group did not have birthdates recorded. Consequently it was necessary to omit the variable "Age

when sentenced" from the calculation of the score of both the trainees and controls.

Inspection of Table 2.6 indicates that eight of the twelve factor coefficients with the largest absolute values (indicated by asterisks) are found in factor one, and give the variables education, work adjustment, mother's and father's influence, parental marriage, IQ, average grade rating, and age at first attention of authorities relatively large weights in the calculation of the score. In factor two, the coefficients on average grade rating, juvenile corrections history, adult probation felony, and total time served have relatively large weights in the score.

18. Despite double checking at the time the matching was done, it was subsequently discovered that three matches (.78% of the total matches) were incorrect by year released. Two cases were mismatched by one year and the third, by two years.

19. The creation of economic and non-economic crime categories was based on the crime codes used in the master tapes. Economic crimes are those primarily or entirely motivated by the desire for economic gain. These include assault with intent to rob and steal, extortion, robbery, drugs (sale, distribution, manufacture, or illegitimate use/possession/traffic), burglary, larceny, auto theft; forgery, uttering and publishing; embezzlement, fraud, prostitution, desertion and non-support, and gambling. Non-economic crimes are those primarily or entirely motivated by non-economic factors. These include homocide, rape, abduction-kidnapping, assault (non-economic and associated with physical injury), offenses against children, sex, arson, bribery, malicious destruction, weapons, interfering with legal processes, interfering with public utilities or services, motor vehicle code violations, drugs (possession, addiction, unlawful use, other miscellaneous violations), and miscellaneous. Some ambiguities result from the division made between economic and non-economic crimes. The category of arson includes burning property for insurance as well as for other reasons, but the number of cases of arson is quite small. The motivation for kidnapping is not clear; the number of cases is also quite small. It should be noted that the crimes recorded are those for which a man was sentenced; this may not be the same crime as that for which he was initially arrested if the charge was reduced by plea bargaining.[4]

CHAPTER 3

SAMPLE CHARACTERISTICS

3.1 Introduction

Although the pre-prison characteristics of the sample are described in Chapter 2, several sample features remain to be discussed. These include: additional vocational training enrollment characteristics of the trainees; the prison experience characteristics of the sample; and the earnings distribution of the sample.

3.2 Trainee Enrollment Characteristics

Tables 3.1 and 3.2 indicate crosstabulations of trainee characteristics by vocational training program. Table 3.1 gives the vocational training program categories by prior criminal record. First offenders were most heavily enrolled in professional programs, while those with more extensive criminal records (two or more prior jail or prison terms) were most attracted to clerical, service, and operative programs. This may reflect the greater knowledge of the experienced inmate about prison life and the lucrative hustles available in the prison for those with clerical, kitchen, and porter jobs.[1]

Table 3.2 shows the distribution of vocational programs by formal education completed, race, and age at release. Among the trainees enrolled in the clerical

Table 3.1 Vocational Training Categories by Pre-Prison Criminal Record*

Prior Criminal Record	Vocational Training Categories					
	PROF	CLER	OP	SERV	CRFTS	Row Total
No Prior Jail or Prison Terms						
No Juvenile Record	33	2	23	27	26	111
Juvenile Record	10	0	5	7	13	35
	(41%)	(15%)	(28%)	(34%)	(36%)	(34%)
One Prior Jail or Prison Term						
No Juvenile Record	14	4	17	11	19	65
Juvenile Record	11	1	11	8	11	42
	(24%)	(39%)	(28%)	(19%)	(27%)	(25%)
Two Prior Jail or Prison Terms						
No Juvenile Record	8	1	5	7	7	28
Juvenile Record	2	2	4	5	5	18
						(11%)
Three Prior Jail or Prison Terms						
No Juvenile Record	2	1	4	7	6	20
Juvenile Record	3	0	4	2	3	12
						(8%)
Four or More Prior Jail or Prison Terms						
No Juvenile Record	9	0	11	15	13	48
Juvenile Record	13	2	15	10	7	47
	(35%)	(46%)	(43%)	(47%)	(37%)	(22%)
Column Total	105	13	99	99	110	426
	(25%)	(3%)	(23%)	(23%)	(26%)	(100%)

* The totals in the vocational training categories professional, service workers, and craftsmen in this and subsequent tables differ from those in Table 2.4 due to trainee enrollment in two or more vocational programs in the same training program category. The vocational training programs are abbreviated as follows: professional (PROF), clerical (CLER), operatives (OP), service workers (SERV), and craftsmen (CRFTS).

Table 3.2. Vocational Training Categories, by Age at Release, Formal Education Completed, and Race[a]

Vocational Training Categories, by Age Groups	White					Nonwhite					Row Total
	Formal Education Completed					Formal Education Completed					
	GR1-6	GR7-8	HS1-2	HS3-4[b]	College[c]	GR1-6	GR7-8	HS1-2	HS3-4[b]	College[c]	
Clerical											
19 or less	0	0	0	0	0	0	0	0	0	0	0
20 to 24	0	0	0	0	0	0	0	0	0	0	0
25 to 29	0	1	0	1	0	0	0	1	2	0	5
30 to 35	0	2	0	0	0	0	1	1	0	0	4
36 & up	0	0	1	0	0	0	0	1	2	0	4
Craftsmen											
19 or less	0	2	2	1	0	0	1	3	0	0	9
20 to 24	0	2	14	6	0	0	2	5	5	1	35
25 to 29	1	2	8	6	0	0	0	4	6	0	27
30 to 35	1	6	3	3	1	0	1	3	4	0	22
36 & up	0	1	6	3	1	0	2	0	3	1	17
Operatives											
19 or less	0	0	0	0	0	0	0	1	0	0	1
20 to 24	0	7	8	3	0	0	4	3	3	0	28
25 to 29	1	2	12	4	0	0	1	12	6	0	38
30 to 35	0	1	1	4	0	0	6	2	3	0	17
36 & up	1	4	4	1	0	0	3	1	1	0	15
Professional											
19 or less	0	0	0	1	0	0	0	0	0	0	1
20 to 24	0	1	2	14	2	0	3	3	3	1	29
25 to 29	0	0	11	5	0	0	0	7	12	2	37
30 to 35	0	0	1	4	0	1	3	4	4	0	17
36 & up	0	2	4	4	0	1	2	3	5	0	21
Service Workers											
19 or less	0	0	0	0	0	0	0	0	0	0	0
20 to 24	0	3	4	2	0	0	1	6	2	0	18
25 to 29	1	3	12	1	0	1	2	9	8	1	38
30 to 35	0	1	2	2	0	4	1	2	5	0	17
36 & up	3	6	1	1	0	4	7	3	1	0	26

a. This table was constructed using 426 cases which reflects enrollment in more than one vocational training program by some inmates. Formal education completed refers to the education at the time of incarceration.
b. Includes passing the GED exam and special education.
c. Includes one year or more of college.

program, 40% of the whites and 88% of the nonwhites had completed a minimum of one year of high school; in the craftsmen programs, 78% and 85% respectively; in the professional programs, 94% and 81% respectively; in the service programs, 60% and 65%, respectively; and in the operatives programs, 70% for both groups. These data for the professional and service programs reflect the minimum educational requirements for enrollment in the programs.[2] Those 24 or younger represented 40% of the enrollment in craftsmen programs: 29%, of operatives and professional programs, and 18%, of service worker programs. However, 34% of the whites aged 24 or less were enrolled in operatives programs as compared with 24% of the nonwhites, and 37% of the whites were enrolled in professional programs as compared with 19% of the young nonwhites.

Table 3.3 indicates the length of time the trainees were enrolled in vocational programs. The average time enrolled was about five months. In five of the twelve programs listed the average enrollment period was less than that recommended by the Department of Corrections. Approximately 31% of the trainees were enrolled seven months or more.[3]

Approximately 79% of the trainees completed at least one vocational program.[4] 14% were enrolled in two or more vocational programs while in prison.[5] 53% of the trainees waited seven months or less from the completion of their program to their release from prison.

Table 3.3. Length of Trainee Enrollment in Vocational Programs, to nearest month[a]

Program	Minimum Enrollment	Maximum Enrollment	Average Enrollment	Approximate Recommended Program Enrollment
PROFESSIONAL, TECHNICAL, & KINDRED WORKERS				
Computer Programming	3	6	4	4
Data Processing	1	7	4	4
Electricity/Electronics	2	22	10	11[b]
Machine Drafting	6	12	8	6
Vocational Music	2	21	6	24[c]
CLERICAL WORKERS				
Vocational Business	4	8	5	9[d]
CRAFTSMEN & KINDRED WORKERS				
Auto Body Reconditioning	1	14	6	6
Auto Mechanics	2	12	5	12[e]
Machine Shop	1	13	6	5[f]
OPERATIVES				
Welding	1	17	4	6
SERVICE WORKERS				
Food Services (Cooking &/or Baking)	2	12	3	2
Custodian Training	1	6	1	1[g]

[a] The hours spent in class per week vary from fifteen to forty.

[b] This recommended enrollment period would enable a man to learn the basic electrical technician skills. However, a more complete program providing the basis for most electronics occupations would require fifteen months.

[c] The recommended program consists of thirteen courses. This recommendation assumes that two courses are taken a term during terms lasting fifteen weeks.

[d] The minimum recommended program consists of nine courses. This recommendation assumes that three courses are taken a term during terms lasting fifteen weeks.

[e] The four month program provides entry level skills as a service station mechanic. The fifty week automotive mechanic program prepares a student for employment as a beginning mechanic in a garage or automotive dealership.

[f] The five month program teaches machine operator skills. A twenty-four month program is required to become a machinist.

[g] This is a five week program.

3.3 Prison Experience Characteristics

Two similarities in the prison experiences of the trainees and controls were ensured by the matching procedure: each trainee was paired with a control who had been incarcerated for most or all of his sentence in the same prison as the trainee, and both were released from prison in the same year. Approximately 79% of the sample selected was incarcerated in the SPSM; 17%, in the MTU; and 4%, in the MR. 19% were released in 1969; 23%, in 1970; 25%, in 1971; 21%, in 1972, and 12%, in 1973.

In contrast, Table 3.4 indicates the differences in the prison experience characteristics of the trainees and controls. The differences in the means of the variables: incarcerated from 1968 through 1973, passed the GED exam or earned a high school diploma, and earned three or more high school credits while in prison, were significant at the 2.5% level; length of sentence served and released by discharge, at the 5% level; and age at release, at the 10% level. However, despite these significant differences, about 30% of the trainees as well as the controls were returned to prison after release. 74% of the trainees and 68% of the controls were returned to prison due to parole violations.

A comparison of Tables 2.6 and 3.4 indicates that the means of approximately 38% of the pre-prison variables differed significantly while approximately 67% of the means of the prison experience characteristics differed

Table 3.4. Prison Experience Characteristics of Trainees and Controls

Variable	Trainee (%)[a]	Control (%)[a]
Year incarcerated		
1967 or earlier	11.9	10.1
1968 ***	35.8	26.9
1969 ***	27.7	19.4
1970-73 ***	24.6	43.5
Length of sentence served[b] ***		
1 year or less (1 to 4 quarters)	13.4	28.4
1 to 2 years (5 to 8 quarters)	35.7	39.7
2 to 3 years (9 to 12 quarters)	25.0	16.0
3 to 4 years (13 to 16 quarters)	14.5	6.7
5 years or more (17 quarters or more)	11.2	9.2
New sentences received during prison term		
None	93.3	93.5
One	6.2	4.9
Two	.5	1.6
Passed GED exam or earned high school diploma[c] ***	18.9	10.1
Earned three or more high school credits ***	22.0	11.4
Released by discharge **	14.5	10.1
Age at release *		
18-19	2.6	3.7
20-24	26.6	26.0
25-29	31.9	28.8
30-34	17.4	13.9
35-39	8.9	9.9
40 and up	12.9	17.7
Rate of unemployment during quarter released[d]		
3.9-4.9%	18.9	19.1
5.0-5.9%	8.5	8.0
6.0-6.9%	14.7	13.7
7.0-7.9%	12.7	16.1
8.0-8.4%	45.0	43.0
Returned to prison after released	30.3	30.3

[a] The totals may not add to 100% due to rounding.
*** The difference in the means was significant at the 2.5% level.
** The difference in the means was significant at the 5% level.
* The difference in the means was significant at the 10% level.

[b] See Chapter 3, Footnote 10.

[c] See Chapter 3, Footnote 11.

[d] See Chapter 3, Footnote 12.

significantly. This suggests that the trainees and controls were relatively similar in their pre-prison characteristics but experienced very different incarcerations. Although it is not clear from these data why the prison experience varied, there is a notable difference in the extent to which the inmates were involved in educational programs. The more extensive involvement of the trainees may reflect their relatively longer incarceration which would have facilitated enrollment in, and completion of, high school as well as other types of educational programs.

3.4 Earnings Distribution of the Sample

The earnings distribution data of the sample provided by the Social Security Administration contained the means and crosstabulations of earnings by sample characteristics for the pre-prison and post-release earnings recorded in the Lifetime Earnings File. This recorded income data,[6] as well as the estimated earnings effects in the human capital regressions (see Chapter 5), are underestimated due to three factors. First, the SSA data do not provide detailed information on labor force participation. Consequently there is no way of determining why 21% to 47% of the sample earned zero income as shown in Table 3.5. However, since about 90% of the labor force is employed in covered employment and convicted felons are unlikely to work for government, the zero income is probably due to youthfulness, particularly for income five years before incarceration, being out of the labor force, and/or unemployed, rather

Table 3.5. Pre- and Post-Prison Earnings Distribution for Sample, in percentages

Annual Earnings Variables	Earnings Levels, in dollars*								
	None	1-1200	1201-2400	2401-3600	3601-4800	4801-6600	6601-7800	7801-10,800	10,801 +
Pre-Prison Annual Income									
Income Fifth Year Before Incarceration	47	28	11	5	8	1	0	0	0
Income Fourth Year Before Incarceration	37	33	11	7	9	3	0	0	0
Income Third Year Before Incarceration	29	30	17	10	7	5	1	0	0
Income Second Year Before Incarceration	22	34	16	10	9	7	2	0	0
Income First Year Before Incarceration	21	32	18	9	9	7	2	0	0
Average Annual Post-Prison Income	24	22	13	10	7	7	5	8	4

* The row totals may not sum to 100% due to rounding.

than lack of coverage. As Table 3.6 indicates, age appears to be a major explanatory factor for pre-prison income, while the average unemployment rate in Michigan of 7.25% from 1970-73 may be a major factor for post-prison earnings.

Table 3.6. Distribution of Zero Earnings by Age at Release, in percentages

Annual Earnings Variables	Age at Release 18-27	28-37	38 & up
Pre-prison Annual Income			
Fifth Year Before Incarceration	29	9	9
Fourth Year Before Incarceration	23	7	6
Third Year Before Incarceration	17	7	6
Second Year Before Incarceration	7	6	5
First Year Before Incarceration	11	6	4
Post-prison Annual Income	12	8	5

Second, the earnings in the Lifetime Earnings File measure only legitimate income. It does not indicate whether there was an increase in illegitimate income due to a man becoming a more proficient criminal while in prison, whether due to the exposure to other criminals or education and training received while incarcerated. Finally, some inmates after their release may have acquired a Social Security number different from the one recorded in the Department of Corrections files. As a consequence the men would have been accurately traced in their pre-prison earnings record, but would show zero earnings in their post-release record. It is difficult to predict the size of the effect of excluding illegitimate income or the number of inmates who change their Social Security number after release. Since the

entire sample may be affected, particularly by the omission of illegitimate income, the effect is potentially quite large.

The means and range of the pre- and post-prison earnings of the sample, the trainees, and the controls are shown in Table 3.7. The upper and lower earnings ranges are those used by the Social Security Administration in reporting the results. Although the average earnings of the controls were greater than those of the trainees the third, fourth, and fifth years before incarceration, the situation was reversed in the first and second years before incarceration and after release. In addition, it should be noted that the average annual post-prison income of the trainees and controls differed by only $88. This may reflect the similarity in their post-release experience since both groups had an average measured rate of recidivism of about 30%.

A comparison of the sample mean pre-prison income during the year before incarceration and the post-prison mean income suggests that the prison experience raised the legitimate post-prison income by roughly $566 more than would be expected,[7] regardless of whether the men were enrolled in vocational training and education programs. This in turn suggests that more legal employment was encouraged. The higher income may also have resulted from steadier employment. If the unemployment rates during the period studied had been lower, the post-prison income might have been even larger.

Table 3.7. Pre- and Post-Prison Mean Earnings, to Nearest Dollar

Annual Earnings Variables	Mean Earnings			Sample Earnings-Range
	Sample	Trainees	Controls	
Pre-Prison Annual Income	$	$	$	$
Fifth Year Before Incarceration	888	811	966	0 - 7,799
Fourth Year Before Incarceration	1123	1093	1153	0 - 8,999
Third Year Before Incarceration	1468	1446	1491	0 - 10,799
Second Year Before Incarceration	1675	1813	1536	0 - 10,799
First Year Before Incarceration	1752	1909	1593	0 - 8,999
Average Annual Post-Prison Income	3223	3267	3179	0 - 13,200 +

Although there are no income data that are exactly comparable to the earnings data of this sample, some crude comparisons can be made. The average income reported to the New Jersey Income Maintenance Experiment in 1970 was $4537.[8] This information, combined with the expected mean earnings estimated using data from the 1970 census in Michigan and 1974 reports of consumer income as indicated in Table 3.8, suggest that the post-prison income was considerably less than what would have been expected if the sample had received an income comparable to that of the general male population for men ages 25 and up. However, the differences were not great for men ages 18 to 24. In contrast, the results of this study seem consistent with the findings of a North Carolina follow-up study which found that ex-offenders released for an average period of three years earned about 70% of the average income for comparable groups of adult men. The North Carolina study indicates that the most difficult time in the job market is the first year after release, but wages and jobs improve as time passes. For the average parolee the real income of the first job after release was less than that of the last job prior to incarceration.[9]

The earnings distribution by vocational training categories is given in percentages in Table 3.9. The sum of the percentages in each row may not equal 100% due to rounding. Over 50% of each vocational training category is in the earnings range from $1 to $3600.

Table 3.8. Expected Mean Annual Earnings for Sample for Years 1969 and 1974,[a] by Age, Education, and Marital Status

	1969	1974
	$	$
Age 18 to 24 Average Based on Years of Schooling Completed	3606	3303
Age 25 and Up Average Based on Years of Schooling Completed	7463	6992
Average Based on Marital Status	4885[b]	7691[c]

a. Source: U.S. Department of Commerce, Bureau of the Census, 1970 Census of Population, Detailed Characteristics: Michigan, Tables 197, 198, and 205, and Current Population Reports: Consumer Income: Money Income in 1974 of Families and Persons in the United States, Tables 57, 58, and 72. The 1969 total income estimates were for males in Michigan, calculated by weighted averages based on age, education, and marital status of the sample and adjusted downward by the percentage of total income represented by wages and salaries. The 1974 total income estimates were for males in the United States 18 years and older as of March, 1975; these were handled in the same fashion as the 1969 data.

b. For ages 14 and up. The downward adjustment of total income was based on the percentage of 1969 total income represented by wages and salaries.

c. The downward adjustment of total income was based on the percentage of 1969 total income represented by wages and salaries.

Table 3.9. Pre- and Post-Prison Average Annual Earnings Distribution, by Vocational Training Category,* to nearest percentage.

Average Annual Earnings Variables	Income: None					Income: $1-$3599				
	PROF	CLER	OP	SERV	CRFTS	PROF	CLER	OP	SERV	CRFTS
Income Fifth Year Before Incarceration	13%	1%	9%	9%	12%	11%	1%	13%	12%	10%
Income Fourth Year Before Incarceration	9	1	7	7	10	13	2	16	13	13
Income Third Year Before Incarceration	7	1	7	6	8	15	2	13	14	14
Income Second Year Before Incarceration	4	0	5	3	6	16	2	14	15	13
Income First Year Before Incarcerion	5	1	4	4	4	14	1	15	13	15
Average Post-Prison Income	4	0	5	5	7	11	2	10	12	11

	Income: $3600-$7800					Income: $7801 & up				
	PROF	CLER	OP	SERV	CRFTS	PROF	CLER	OP	SERV	CRFTS
Income Fifth Year Before Incarceration	1%	0%	0%	2%	3%	0%	0	0%	0%	0%
Income Fourth Year Before Incarceration	3	0	1	4	3	0	0	0	0	0
Income Third Year Before Incarceration	3	0	3	3	4	0	0	0	0	0
Income Second Year Before Incarceration	5	1	4	5	6	0	0	0	0	0
Income First Year Before Incarceration	6	1	4	6	7	0	0	0	0	0
Average Post-Prison Income	6	1	5	3	4	4	0	2	3	4

* This table was constructed using 424 cases which reflects enrollment in more than one vocational program by some inmates. The row totals may not sum to 100% due to rounding. The vocational training programs are abbreviated as follows: professional (PROF), clerical (CLER), operatives (OP), service workers (SERV), and craftsmen (CRFTS).

3.5 Conclusion

Two important features of the sample characteristics discussed in this chapter emerge upon review. First, the Department of Corrections' screening channeled men with relatively high levels of education into professional training programs. This suggests that the men least likely to recidivate, as well as those most able to acquire legitimate employment, were enrolled in these programs. This may bias the estimation results in favor of professional programs to the extent that the matching process was unable to reflect these factors. Second, the income characteristics of the sample are consistent with expectations by age groups, and the post-prison earnings experience of this sample is quite similar to that of a carefully studied ex-offender group in North Carolina. Consequently the earnings data appear to be typical of what would be expected for ex-offenders. However, the reader is reminded that these two conclusions are based on background and vocational training data of questionable validity and data that underestimated earnings.

APPENDIX

PROGRAM COMPLETION CRITERIA

The minimum criteria for completion by vocational program are as follows:

1. Professional, Technical, & Kindred Workers

    a. Computer programming: completed a four month program and received a certificate

    b. Data Processing: earned one high school credit or received a certificate

    c. Electricity/electronics: completed three out of six basic courses, which would permit employment as an assistant electrical technician. If no record of completion of an intermediate course in the five course sequence was found but a subsequent course was completed, it was assumed that the record was incomplete and that the intermediate course was passed. However, the probable length of enrollment in the missing class was not included in the calculation of the length of time enrolled in vocational programs: the missing courses were found only in the records of men enrolled from 1966-70 when the class might have been taken as a non-credit cell study course.

    d. Machine Drafting: completed a six month program and received a certificate

    e. Vocational Music: Completed concert Band courses 1 through 6 and Orchestra 1 through 6

2. Clerical Workers

    a. Vocational Business: complete three courses in office machines and basic accounting or four courses in basic and advanced bookkeeping and accounting

3. Craftsmen & kindred Workers

    a. Auto Body Reconditioning: earned one high school credit or received a certificate stating minimum skills were achieved

    b. Auto Mechanics: earned one high school credit or certified to have auto serviceman skills

c. Building trades:

(1) Sign painting: received certificate or enrolled in program at least six months

(2) Carpentry, Bricklaying: earned one high school credit or received certificate

d. Heating & Air Conditioning: certified that completed entire course

e. Machine Shop: earned one high school credit or received certificate indicating minimum skills as a machine operator, lathe operator, or in bench work

f. Typewriter Repair: received passing grade

4. Operatives

a. Vocational Graphics (Printing): earned one high school credit

b. Welding: earned one high school credit or certified to do flat or production welding

5. Service Workers

a. Food Service: earned one high school credit for cooking and/or baking

b. Custodian Training: received certificate for five week program

c. Barbering: received certificate

FOOTNOTES

1. See the discussion of dealing in George Dixon, "Beating the Man," (in Conformity and Conflict, ed. by James P. Spradley & David W. McCurdy, Boston: Little, Brown & Co., 1974, 2nd.ed.), pp. 244-247, and Sandra E. Gleason, "Hustling: The 'Inside' Economy of a Prison," Federal Probation (forthcoming 1978).

2. According to Department of Corrections guidelines published in December, 1974, the professional programs require a minimum reading and math competency at the ninth grade level, while the service programs require a sixth grade competency level. However, no information was provided for vocational music or clerical programs. The craftsmen and operatives programs require competency ranging from the fifth to the ninth grade level. However, in many of these programs a man with a lower level of competency might be considered.

3. Program length was measured by the number of months a man was enrolled in a vocational program. When only the entry or exit date was available, coupled with some information about the degree of achievement in the program, the length of time in the program was estimated based on the time required by other men in the same program during the same year or the nearest year available. Prerequisite courses, such as beginning band for the vocational music program, and related courses, such as blueprint reading for machine shop, were excluded from the calculation of the program length. In order to make the program length comparable between the academic and trade vocational programs, the program length for vocational music and vocational business was based on the assumption that three classes were taken each day.

4. Except for inmates enrolled in the short programs such as custodian training, relatively few men complete the full vocational program because their sentence is not long enough to cover the recommended training period as well as the frequent waiting period before they can enroll in a program. Consequently, it was necessary to determine at what point a trainee had acquired minimum entry skills which would help him find a job. When a man achieved that minimum as judged by the time enrolled and other information in his file, he was treated as a completer. If a man acquired more than the minimum entry skills, this would be reflected in the program length variable. See Appendix for the minimum completion criteria employed.

5. The enrollment characteristics of those men enrolled in two or more courses are reflected in two variables. a) The program length for this group was calculated as the sum of the time enrolled in all vocational training programs. b) Since most men enrolled in two or more programs were enrolled in both for relatively long periods, it was impossible to select a single program as the most important. Consequently, a code of one was placed in all of the vocational program categories and also for the specific vocational programs studied.

6. The pre- and post-prison annual incomes were selected from the years 1951-74, but most of the sample income were from the years 1963-74. An average of only 2.6% of the sample reached the maximum taxable income during the years 1963-74. 1.3% had incomes greater than the yearly taxable maximum due to recorded employment with more than one employer. It would be difficult to extrapolate the actual income earned for this and to adjust the human capital regression accordingly due to the confidentiality constraints on the research.

7. The highest pre-prison mean income was $1752 for income one year before incarceration. If we assume that a man was released in 1969 after serving an average sentence of under two years, this pre-prison income would be for the year 1967. Adjusting this pre-prison mean income by the percentage increase in gross average annual weekly earnings of production or non-supervisory workers on private payrolls from 1968 through 1974 would estimate a 1974 average income of $2657. (Source: U.S.D.O.L. & U.S.H.E.W., Employment and Training Report of the President, Wash., D.C.: U.S.G.P.O., 1976, p. 296.) This amount is about $566 less than the $3223 average post-prison income for the years 1969 through 1974. An attempt was made to adjust for the effect of age on income using unpublished human capital regression results estimated by Daniel Hamermesh in 1977. The data used in his regression were for white males in 1973; the source of the data was the Michigan Panel Study of Income Dynamics. However, the effect of the increase of the sample average age from 27.3 years at sentencing to 29.9 years at release on income was so small that it could be ignored.

8. David Kershaw and Jerilyn Fair, The New Jersey Income-Maintenance Experiment V. 1 Operations, Surveys, and Administration (NY: Academic Press, 1976), p. 173.

9. Ann Dryden White, "Earnings and Jobs of Ex-Offenders: A Case Study," Monthly Labor Review 99:12 (Dec., 1976), p. 31.

10. The length of the sentence served was calculated using the date the man was received at the Reception and Guidance Center (RGC) and the release date. This period was adjusted for time on escape only if the man was gone more than two months since most escapees are caught within a few days of their escape. This definition of sentence length measures only the time spent in the RGC and prison and excludes time incarcerated in jail prior to commitment. This sample spent an average of two to three months between sentencing and commitment to the RGC and about one month at the RGC for processing before assignment to a specific institution.

    Some of the men released early in the period studied had incomplete records in which the original commitment date was unavailable. In these cases the earliest available commitment date was used, such as that associated with an escapee returned to prison or the receipt of a new sentence while in prison. The substitution of the earliest available commitment date also meant replacing the original crime category with a non-economic category, such as breaking escort or escaping. As a consequence, the economic crimes may be underestimated.

11. Many employers view a high school degree and a high school equivalency degree earned by passing the GED exam as equivalent for hiring purposes.

12. The rate of unemployment was based on the civilian unemployment rate in Michigan during the quarter released. The data were the most recent figures available from the Michigan Employment Security Commission. The data from January, 1970 through December, 1973 were based on revised estimates published in March, 1975.

CHAPTER 4

ESTIMATION RESULTS ON REGRESSIONS OF RECIDIVISM

4.1 Introduction

The differences in the rates of recidivism of the trainees and controls were estimated using a linear probability model. Recidivism was defined for this purpose as reincarceration in a Michigan state prison due to a new sentence or parole violation after the first release during the period from 1969 through 1973. Only those ex-offenders who were caught committing a crime or violating parole in Michigan could be treated as recidivists.[1] Consequently, the results of this analysis underestimate the true rates of recidivism. This may create some bias in the differential effects between trainees and controls if training helped the trainees become more efficient criminals.

4.2 Procedure

A linear probability model was estimated in the following basic form:

$$R_i = a_o + \sum_{j=1}^{16} \delta_j P_{ij} + \sum_{k=1}^{13} c_k X_{ik} + \sum_{l=1}^{n} d_l T_{il} + e_i$$

for the ith individual where

R = measure of recidivism
a_o = constant term
P_o^j = pre-prison control variables
X_j^k = prison experience control variables
T_1^k = training program variables
e^1 = error term.

The measure of recidivism (R) is a dichotomous variable such that a code of one indicates a return to prison after release and a code of zero indicates no return to prison after release.

The basic equation was estimated in two versions. The training program regression (Regression #1) employed a dummy variable for each particular training program. Those programs for which there was only one sample point (typewriter repair, barbering, printing, and building trades) were combined in the category "Other." The program category regression (Regression #2) replaced the dummy variables for particular training programs with dummy variables for broad categories of training programs. For example, the variable for the computer programming course in Regression #1 was replaced with the variable for a professional program in Regression #2.

The use of a linear probability model was justified by three considerations. The problems of heteroskedasticity, the inapplicability of the classical significance tests, and the indeterminacy of the predicted value of R such that it might lie outside the correct value range are well documented difficulties associated with the use of a linear model.[2] However, estimates of the parameters are still

unbiased. Second, linear and probit models yield similar results when evaluating small changes in the variables about the sample means, but differ when large changes are envisioned. This analysis focuses on the regions where the linear approximation may be satisfactory. Finally, time and cost limitations constrained the use of more complicated and expensive computational methods.[3]

4.3 Variables in the Regressions

Two sets of variables were included in the regressions: vocational training program variables to measure the impact of the prison vocational training programs, and variables measuring pre-prison and prison experience characteristics to help control for possible selection bias in the estimates of the training effects (see Appendix). The training program variables are given in Table 4.1. The expected signs, as discussed in Chapter 1, are unclear. The ambiguity about the expected sign reflects the fact that training may improve both lawful and unlawful skills.

4.4 Estimation Results

The results of the estimation of the training variables in the recidivism equations are given in Table 4.2 (see Appendix for estimation results of the control variables). The t-statistics for each regression coefficient are given in the parentheses under the coefficient. Significant variables are defined as those with a t-statistic of 1.282 or larger in a one-tailed test. The mean rate of

Table 4.1. The Training Variables in the Recidivism Regressions

Training Variables

1. Completed One Vocational Program (1 = completed one or more programs, 0 = otherwise)
2. Enrolled Seven Months or More (1 = seven months or more; 0 = six months or less)
3. Enrolled in Two or More Programs (1 = enrolled in two or more programs; 0 = otherwise)
4. Vocational Training Program Categories (1 = training program category; 0 = otherwise)
5. Vocational Training Programs (1 = training program; 0 = otherwise)

---

measured recidivism was .30 for the sample with a standard deviation of .4602.

Table 4.2 indicates that the training programs regression (Regression #1) yielded no significant coefficients on the training program characteristics, and only three of the fourteen training programs were significant: machine drafting, auto body conditioning, and cooking and baking. Machine drafting, a professional program, was the only program which reduced the probability of recidivism.[4] However, it should be noted that the enrollment in machine drafting, auto body reconditioning, and cooking and baking was low relative to the sample size (11, 16, and 32 cases respectively). In the program category regression (Regression #2) craftsmen and service worker programs increased the probability of recidivism while program completion decreased the probability of recidivism.

Table 4.2. Empirical Results for the Training Variables in the Recidivism Regressions[a]

	Regression #1	Regression #2
R^2	.1273	.1177
$\bar{R}^2$	.0719	.0732
Training Variables[b]		
Completed One Vocational Program	- .0617 (.9029)	- .0972* (1.5560)
Enrolled Seven Months or More	.0080 (.1214)	- .0107 (.1756)
Enrolled in Two or More Programs	.0391 (.3630)	.0326 (.3771)
Vocational Training Category		
Clerical	--	- .0561 (.4275)
Craftsmen	--	.1172* (1.5931)
Operatives	--	.0453 (.6372)
Professional	--	- .0580 (.8173)
Service Workers	--	.1611** (1.9524)
Vocational Training Programs		
PROFESSIONAL		
Computer Programming	- .1975 (.8010)	
Data Processing	- .0799 (.5865)	
Electricity/Electronics	- .0702 (.7551)	
Machine Drafting	- .2042* (1.3038)	
Vocational Music	.0232 (.2223)	
CLERICAL	- .0699 (.5260)	

Table 4.2. continued

	Regression #1
CRAFTSMEN	
Auto Body Reconditioning	.2440** (1.8376)
Auto Mechanics	.1098 (1.1206)
Heating and Air Conditioning	- .2517 (1.0603)
Machine Shop	- .0158 (.1623)
Other[c]	.0742 (.3068)
OPERATIVES	
Welding	.0158 (.2004)
SERVICE WORKERS	
Cooking and Baking	.1596* (1.4418)
Custodian Training	.1033 (1.1153)

[a] The control variables included in the regressions are given in the appendix.

[b] *** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

[c] Includes building trades, typewriter repair, printing, and barbering.

In order to evaluate the impact of the vocational programs on various trainee subgroups, the results of Regression #2 were used to construct Tables 4.3 and 4.4. Each cell in these tables contains the estimated coefficient, the t-statistics in parentheses, and the number of men in the cell. The estimates of the variance of the coefficients for the trainee subgroups used to calculate the t-statistics were calculated using the variance-covariance matrix for the estimated regression coefficients. In addition, Table 4.3 assumes that the absolute effect of the program impact is the same for all training programs. However, as discussed below, this is unlikely, but the direction of the bias which may result is uncertain. It should be noted that the coefficients for the clerical training programs are insignificant in Table 4.3. This may reflect the small size of the sample rather than any deficiencies in the program per se.

A review of the estimated impact of training by program characteristics given in Table 4.3 indicates that two subgroups of service workers and one subgroup of craftsmen experienced significantly increased rates of recidivism as compared with the other trainees and the controls. However, these three subgroups accounted for only approximately 3% of the total trainees. In contrast, professional programs accounting for approximately 61% of the professional trainees, or 98% of the professional program completers, experienced significantly lower rates of recidivism as compared with the other trainees and the controls. The

Table 4.3. Vocational Training Program Impact on Recidivism by Program Characteristics, in percentages

Program Characteristics	Training Program Category					
	PROF	CLER	OP	SERV	CRFTS	Totals
Completer, enrolled 6 months or less, one program	- .1552** (1.9720) 11	- .1533 (1.1398) 3	- .0519 (.8109) 46	.0639 (1.0240) 73	.0200 (.3311) 52	185
Completer, enrolled 6 months or less, two or more programs	- .1226 (1.1248) 1	----	- .0193 (.2078) 10	.0965 (1.1067) 7	.0526 (.5468) 8	26
Completer, enrolled 7 months or more, one program	- .1659*** (2.4184) 29	- .1640 (1.1590) 1	- .0626 (.8119) 10	.0532 (.6464) 2	.0093 (.1372) 31	73
Completer, enrolled 7 months or more, two or more programs	- .1333* (1.4861) 24	- .1314 (.8275) 1	- .0300 (.3322) 14	.0858 (.9491) 14	.0419 (.4703) 8	61
Non-completer, enrolled 6 months or less, one program	- .0580 (.8173) 28	- .0561 (.4275) 8	.0453 (.6372) 18	.1611* (1.9524) 2	.1172* (1.5931) 10	66
Non-completer, enrolled 6 months or less, two or more programs	----	----	.0779 (.9701) 1	.1937** (2.2523) 1	----	2
Non-completer, enrolled 7 months or more, one program	- .0687 (.9063) 9	----	----	----	.1065 (1.1476) 1	10
Non-completer, enrolled 7 months or more, two or more programs	- .0361 (.4658) 3	----	----	----	----	3
TOTALS	105	13	99	99	110	426

*** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

impact is highly significant for the subgroup accounting for 28% of the professional trainees; this group consisted of those who completed one program, were enrolled seven months or more, and who enrolled in only one program. The impact of the professional programs can be explained by two considerations:[5] the enrollment in professional programs may have entailed some self-selection which biased the results upward because it could not be adequately reflected through the use of control variables or by the procedure which matched the trainees and controls, and/or the professional programs per se improved the lawful market opportunities of the trainees who completed the programs.

The issues of the motivation of a trainee in the selection of a particular vocational training program and the possible self-selection biases which might occur as a consequence have received little attention in previous research even though vocational training programs are an important method of voluntary rehabilitation in prison. As a result, there is no evidence from prior research which can provide a perspective on these issues through empirial measurement of the motivational differences. Two considerations may explain the lack of attention given to this aspect of trainee motivation. A number of studies, including this one, have been ex post facto evaluations of training programs. The data employed were recorded in the past, and excluded any measures of motivation since the records were maintained for the administrative purposes of

the prison school. Furthermore, much of the past research was done by sociologists and psychologists who frequently approached the analysis of criminal activity from the perspective of an illness which could be cured with the proper rehabilitative programs. A researcher with this perspective probably would consider motivation irrelevant or unimportant.

Prisoners enroll in vocational programs for a variety of reasons. The motivation for enrollment will have obvious consequences for the extent to which the training is used after release from prison. Although some prisoners intend to achieve a vocational goal, many enroll for avocational reasons. They do not expect any job-related benefits from training after release because they believe that "Rehabilitation is a farce" and ". . . that the rehabilitation programs are of little value."[6]

There are at least three avocational reasons for enrollment which would discourage post-release use of the skills learned. First, the inmate may believe that the parole board views training favorably as an indication of rehabilitation, so that enrollment may improve the chances for parole or speed up release on parole. Second, prisoners may view school as a preferred method of keeping busy while in prison, even though they may sacrifice some income which they might earn in alternative jobs while incarcerated. Finally, for those inmates eligible for the GI educational bill school enrollment provides an income well

above what they could earn in institutional jobs, and may enable them to assist their families financially.[7] As a consequence of the three reasons cited above it may make little difference to the trainee what program is studied, and enrollment may interfere with exposure to more rehabilitative programs.[8]

In contrast, men motivated to "go straight" who realize that this goal entails the acquisition as well as post-release utilization of the job skills learned in prison[9] may find the professional programs the most attractive programs available for two reasons. As discussed below, the skills learned are in relatively great demand. The programs also train men for more attractive high status and well paid occupations as compared with the relatively low status and poorly paid entry level positions available in a secondary labor market occupation such as janitor or service station attendant.

Unfortunately, the importance of the trainee motivation in the self-selection process cannot be evaluated in this study due to the lack of a direct measure of motivation and the use of a sample from a variety of training programs teaching a diverse set of skills. However, it was anticipated that the matching procedure which employed pre-prison background characteristics to match the trainees to a control group (see Table 2.5) would provide indirect measures of motivational differences. It is unclear how well these background characteristics have

succeeded in serving as proxy variables for motivation. An example illustrates the measurement problem. Assume an inmate is identified who has an extensive prior criminal record. It would generally be predicted that his motivation for enrollment in a vocational program would be avocational due to two considerations. The long exposure to the criminal justice system would encourage cynicism about the prison rehabilitation programs so that he would be indifferent about the type of training. In addition, his relatively long experience in illegitimate employment would have resulted in the development of the skills necessary for criminal activity. As a consequence he may see little, if any, need for legitimate employment skills after release. In this situation the background characteristics of an inmate would serve as a good proxy for motivation. However, if some factor excluded from the background variables and not reflected in the training and prison experience variables caused an inmate with an extensive prior criminal record to decide to "go straight," and to take advantage of the available rehabilitation programs which would help him achieve that goal, then these background characteristics would not measure motivation.

In addition to the self-selection process the characteristics of the professional programs help explain the success of these programs in reducing the rates of recidivism. Three aspects of the professionsl programs distinguish them as a group from the other relatively

traditional training programs studied. First, the demand for all of these skills except those of the musicians grew at a relatively rapid rate during the period in which the sample was released[10] as compared with the programs taught the majority of the other trainees. This has three implications. It was less likely that an oversupply of workers with these skills would prevent the trainee from finding a job in which his newly acquired skills could be employed. Also, ex-offenders can be expected to prefer employment with higher wages and fringe benefits, job security, pleasant working conditions, and promotional opportunities. The relatively high skill levels learned in the professional programs made it possible to satisfy some, if not all, of these preferences. Finally, to the extent that higher wages were earned, workers should be less likely to quit their jobs and perhaps confront the necessity of returning to criminal activity to support themselves and their families. This reflects three factors: a positive wage elasticity of labor supply which makes workers less willing to quit a good job to take a vacation; the knowledge that quitting a good job to search for a better one has a low probability of success; and finally, an awareness that workers with a history of relatively stable unemployment are more likely to find better jobs when they change jobs than workers with a history of frequent job changes.[11] The latter two arguments support the findings of prior research which indicate that the quality of the post-release

employment is an important factor in the reduction of recidivism.[12]

Second, it may be that the type of skills taught in the professional programs is less affected by the quality of the equipment used in the program. For example, the use of tools and equipment which meet state requirements but are obsolete[13] in a machine shop program may prevent a trainee from acquiring even the entry level skills needed to operate modern equipment, whereas an older keypunch machine will not interfere markedly with the mastery of keypunching skills.[14]

The final distinguishing characteristic is an average recommended enrollment period for professional programs which is longer than the other programs. In addition, reference to Tables 2.4 and 3.3 suggests that the actual length of enrollment of the average professional trainee was approximately seven and one-half months, while the other trainees were enrolled an average of about four months. The completion of the relatively long professional programs has three implications. The longer training period permits greater mastery of the skills taught, as well as more time to develop good work habits. This should make the trainees more attractive as potential employees. Furthermore, longer training may result in a greater identification with a particular skill. This in turn encourages greater efforts to find employment where the skill

will be used, which would result in a more contented worker and more stable employment.[15] The poorer results for those enrolled in two or more programs may, therefore, be a reflection of a lack of commitment to learning and using one skill, as well as enrollment for avocational rather than vocational purposes. Finally, it has been noted that a common problem among prisoners is their lack of realism when reviewing their aspirations as compared with their ability to achieve these goals.[16] The relatively long enrollment in professional programs may help increase their skills so that they are more in line with their aspirations while encouraging a more realistic appraisal of their goals. "Prison education has to be appreciable in scope to affect significantly the prospects of crime avoidance."[17]

Interaction terms were added to Regression #2 in order to determine whether the measured program impact might have been fortuitously reflecting the year in which the trainee was released from prison. The results are given in Table 4.4. However, the variables representing the years released from prison had no significant impact on recidivism. This suggests that the variable measuring the unemployment rate during the quarter released adequately measured the impact of economic conditions on recidivism.

Table 4.4. Professional Training Program Impact on Recidivism by Year of Trainee Release, in percentages

Year Released	Program Impact	Year Released	Program Impact
1969	.0056 (.0468) 19	1972	.1304 (.5871) 23
1970	- .0042 (.0221) 26	1973	- .2514 (1.0675) 7
1971	.1375 (.6652) 30		

4.5 Conclusions About the Training Variables

Most prior research on prison vocational training programs has suggested that the training has no significant impact on rate of recidivism. These previous studies usually based their conclusions on a single variable reflecting trainee status. The analysis presented in this paper, in contrast, deals with individual vocational training programs as well as training program categories. The results of this analysis indicate that the only programs which consistently and significantly reduced the probability of recidivism are professional programs. However, the extent to which these measured results reflect program characteristics as compared with differences in trainee motivation in unclear.

APPENDIX

THE CONTROL VARIABLES IN THE REGRESSIONS OF RECIDIVISM

4.6 Estimation Results of the Control Variables

The expected signs of the control variables, based on the discussion in the Appendix to Chapter 1, are given in Table 4.5. The estimation results of the pre-prison and prison experience control variables are given in Table 4.6.

The pre-prison control variables measuring married, parental marriage harmonious and home intact, dependable work adjustment, and some diagnostic and/or psychiatric treatment history were significant and decreased the probability of recidivism. The variables measuring mother's influence healthy (Regression #2 only), alcohol abuse, age 15 to 18 at first attention of authorities, adult probation for a felony, one or more years served on prior sentences, and the presence of a juvenile corrections record were significant and increased the probability of recidivism.

All of the significant pre-prison control variables had the expected signs except for psychiatric treatment history and mother's influence. The records do not indicate whether the psychiatric treatment was voluntary or involuntary. If the treatment was voluntary, it may be a proxy for a desire to learn how to cope with personality characteristics which may be hindering a man from "going straight" or being a competent criminal. If the treatment was received involuntarily, a man may have learned something

Table 4.5. Expected Signs of the Control Variables in the Regressions

Pre-Prison Control Variables

1. (-) Married (1 = married; 0 = otherwise)
2. (-) Mother's Influence (1 = healthy influence; 0 = otherwise)
3. (-) Father's Influence (1 = healthy influence; 0 = otherwise)
4. (-) Parental Marriage and Home (1 = harmonious marriage and home intact; 0 = otherwise)
5. (-) Work Adjustment (1 = highly dependable or adequate; 0 = otherwise)
6. (+) Psychiatric Treatment History (1 = some diagnostic and/or treatment history; 0 = otherwise)
7. (+) Alcohol Use (1 = problem drinker or chronic alcoholic; 0 = otherwise)
8. (+) Age at First Attention of Authorities
   14 and under (1 = 14 and under; 0 = otherwise)
   15 to 18 (1 = 15 to 18; 0 = otherwise)
9. (+) Number of Jail and Prison Terms
10. (+) Adult Probation Felony (Number of Terms)
11. (+) Total Time Served
    Up to One Year (1 = up to one year; 0 = otherwise)
    One Year or More (1 = one year or more; 0 = otherwise)
12. (+) Juvenile Corrections History (1 = juvenile record; 0 = otherwise)
13. (+) Type of Crime (1 = economic; 0 = non-economic)
14. (?) Formal Schooling Completed (years)

Prison Experience Control Variables

15. (?) Length of Sentence Served (quarters)
16. (+) Number of New Sentences Received While in Prison
17. (?) Change in Prison Population During Year Released (%)
18. (?) Year Committed
    1968 (1 = 1968; 0 = otherwise)
    1969 (1 = 1969; 0 = otherwise)
    1970-1973 (1 = 1970-1973; 0 = otherwise)
19. (-) Age at Release (years)
20. (+) Time Between Leaving Vocational Program and Release (months)
21. (?) Year Released
    1970 (1 = 1970; 0 = otherwise)
    1971 (1 = 1971; 0 = otherwise)
    1972 (1 = 1972; 0 = otherwise)
    1973 (1 = 1973; 0 = otherwise)
22. (?) Rate of Unemployment During Quarter Released (%)

Table 4.6. Control Variables in the Recidivism Regressions

	Regression #1	Regression #2
Pre-Prison Control Variables[a]		
Married	- .0754** (1.8526)	- .0716** (1.7689
Mother's Influence	.0529 (1.1623)	.0594* (1.3103)
Father's Influence	- .0420 (.7762)	- .0453 (.8418)
Parental Marriage and Home	- .0680* (1.5427)	- .0790** (1.8066)
Work Adjustment	- .0659* (1.5125)	- .0691* (1.5920)
Psychiatric Treatment History	- .0522* (1.4234)	- .0546* (1.4991)
Alcohol Use	.0894* (1.8392)	.0845** (1.7426)
Age 14 and Under at First Attention of Authorities	.0590 (.9909)	.0502 (.8533)
Age 15 to 18 at First Attention of Authorities	.0598* (1.4044)	.0599* (1.4097)
Number of Prior Jail and Prison Terms	.0076 (1.0549)	.0058 (.8078)
Adult Probation Felony	.0578** (1.8034)	.0576** (1.8075)
Total Time Served: Up to One Year	- .0071 (.1599)	.0026 (.0585)
Total Time Served: One Year or More	.0683* (1.4375)	.0786** (1.6682)
Juvenile Corrections History	.0724* (1.6309)	.0783** (1.7801)
Economic Crime	- .0000 (.0012)	.0055 (.1564)
Formal Schooling Completed	- .0030 (.3372)	- .0035 (.3975)

Prison Experience Variables	Regression #1	Regression #2
Length of Sentence Served	.0035* (1.3286)	.0036* (1.3743)
Number of New Sentences Received While in Prison	.0746* (1.3622)	.0892* (1.6436)
Age at Release	- .0065*** (2.4170)	- .0062*** (2.3175)
Unemployment Rate When Released	- .0007** (2.1915)	- .0008*** (2.2303)
Released in 1970	.1395 (1.2471)	.1440* (1.2926)
Released in 1971	.1607 (1.1045)	.1590 (1.0988)
Released in 1972	.1295 (.8026)	.1288 (.8029)
Released in 1973	- .0936 (.8800)	- .0887 (.8385)
Time Between Program and Release	.0020 (.5188)	.0018 (.5050)
Change in Prison Population During Year Released[b]	.0000 (.2751)	.0000 (.1228)
Committed in 1968	.0066 (.1136)	- .0058 (.1008)
Committed in 1969	.0505 (.7731)	.0415 (.6410)
Committed 1970-73	.0029 (.0388)	- .0150 (.2053)
Constant	.8137*** (3.9186)	.8211*** (3.9810)

[a] *** Significant at the 1% level or less.
** Significant at the 5% level or less.
* Significant at the 10% level or less.

[b] Prior to 1948 no data were available on the size of the prison population, and from 1958 to 1964 the data on the prison population were not maintained by institution. Consequently for the period prior to 1964 the average change in the total prison population from 1958 to 1964 was used.

from the experience anyway. In either case, the result would be reduced recidivism. It is not clear why mother's influence should increase the probability of recidivism. A healthy relationship between mother and son may also be an overindulgent relationship in which a lack of discipline gives the son the opportunity to "run with the wrong crowd." However, it should be noted that this variable is only marginally significant.

The prison experience control variables measuring length of sentence served, number of new sentences received while in prison, and released in 1970 (Regression #2 only) were significantly and positively related to recidivism. The coefficient on the first, however, was extremely small. The variables age at release and the rate of unemployment in Michigan during the quarter released were significant and decreased the probability of recidivism. Age at release and the rate of unemployment when released (Regression #2 only) were highly significant but had very small coefficients.

The prison experience variables measuring number of new sentences received while in prison and age at release had the expected signs, but the signs of the other significant variables had been ambiguous in theory. The significant positive effect of longer prison sentences suggests that the opportunities for the prison to become a "factory for crime" increase with greater exposure to the

prison environment. The significance of being released in 1970 may reflect the 3% increase in the Michigan unemployment rate between 1969 and 1970. The negative sign of the unemployment rate supports the work of Gould (see Chapter 1): an economic expansion encourages more criminal activity by former criminals while an economic slowdown discourages it.

4.7 Conclusions About the Control Variables

An explanation of the probability of recidivism cannot be provided without reference to the pre-prison and prison experience control variables which complement the evidence provided by the training program variables. The age of the offender at the time released from prison and the rate of unemployment during the quarter released had a highly significant negative impact on the probability of recidivism. Variables at the 5% significance level which reduced the probability of recidivism were marital status, the parental home environment, work adjustment, and psychological health, while the presence of a prior criminal record significantly increased the probability of recidivism.

FOOTNOTES

1. Two groups of recidivists could not be included in this study. a) The Michigan records normally contain no information about men who may have been reincarcerated for new crimes or parole violations in other states or of federal statutes. b) Ex-offenders who committed new crimes without being caught, who served jail sentences after their release, or who violated parole and either were not caught or punished for the violation could not be counted. It should be noted that only serious parole violations usually result in reincarceration. However, men are sometimes returned to prison as a parole violator for minor violations when that is the fastest way to put a man in prison for a newly committed crime.

   The rate of recidivism may also be underestimated due to the relatively short follow-up period for the men released in 1973.

2. For example, refer to Jan Kmenta, Elements of Econometrics (New York: The Macmillan Company, 1971), pp. 425-428, and Arthur S. Goldberger, Econometric Theory (New York: John Wiley & Sons, Inc., 1964), pp. 248-251.

3. Recent research has demonstrated that the large sample ordinary least squares technique is as satisfactory as large sample generalized least squares, and also reduces the cost and computational inconvenience of more complicated estimation techniques. However, these results are sample specific, and it is not clear what they imply for studies employing different samples.

   See V. K. Smith and C. Cicchetti, "Regression Analysis with Dichotomous Dependent Variables," Research Report, Economic Growth Institute, SUNY/Binghamton, New York, 1973, and Orley Ashenfelter, "A Note on the Use of Dichotomous Dependent Variables in Multiple Regression." Unpublished paper, Princeton University, Department of Economics, 1969.

4. This result is consistent with Pownall's findings. See George A. Pownall, Employment Problems of Released Prisoners (Wash., D. C.: U.S.D.O.L., M.A., 1969), p. 19.

5. An additional explanation may be that men enrolled in professional programs learned better self-protection techniques which reduced the probability of being caught and punished. However, two factors must be considered before accepting this argument. There is no reason to believe that self-protection can be learned more effectively in professional programs than in the other training programs. Also, a review of the results in Chapter 5 indicate that professional trainees experienced sizeable and significant gains in lawful earnings, which suggests that for the group lawful employment became more important as compared with unlawful activities.

6. Erik Olin Wright, The Politics of Punishment (New York: Harper & Row, 1973), pp. 131-132.

7. In 1975 the average payment to veterans enrolled full-time was $300 per month. This estimate was calculated using the marital status and number of dependents of all men admitted to the prison system in 1969.

8. Daniel Glaser, The Effectiveness of a Prison and Parole System, abridged ed. (NY: Bobbs-Merril Co., Inc., 1969), p. 187.

9. This ability to view vocational training as a step in the achievement of a long range goal implies that professional trainees are atypical. Many inmates view the training as only a method of achieving a short term goal, such as early parole, and fail to use the skills attained when released. For further discussion of this point see Robert M. Dickover et al., A Study of Vocational Training in the California Department of Corrections, (Sacramento, CA: Research Division, California Department of Corrections, Jan., 1971), Ch. 4. It has also been suggested that successful ex-offenders belong to achievement oriented subcultures in contrast to other subcultures which disparage work. See Pownall, op. cit., pp. 238-241.

10. U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook (Wash., D.C.: U.S.G.P.O., Bulletin #1875, 1976-77 ed.)

11. Philip Cook, "The Effect of Legitimate Opportunities on the Probability of Parolee Recidivism," (Working Paper, Institute of Policy Sciences and Public Affairs, Duke University, Durham, N. Carolina), pp. 57-58.

12. For example, see Robert Evans, Jr., "The Labor Market and Parole Success," Journal of Human Resources 3:2 (Spring, 1968), p. 208 and Cook, op. cit., p. 68.

13. Girard W. Levy, Robert A. Abram, and Dian LaDow, Vocational Preparation in U.S. Correctional Institutions: A 1974 Survey (Wash., D.C.: U.S.D.O.L., M.A., Dec. 15, 1975), p. 69.

14. Obsolete equipment used in prison vocational training is often treated as an important factor when explaining the lack of impact of the training programs. An example is the treatment by Levy, Abram, and LaDow (refer to footnote 13). However, a survey of employers indicated that employers found few problems due to inadequate skills whereas poor work habits, including problems with drugs, alcohol, and absenteeism, were perceived as the main reason ex-offenders lost their jobs. See Dickover, op. cit., p. 98.

15. Similar results were found in Dickover, op. cit., pp. 15-17.

16. Glaser, op. cit., pp. 210-211, 220.

17. Ibid., p. 187.

CHAPTER 5

ESTIMATION RESULTS ON THE EFFECTS OF PRISON VOCATIONAL TRAINING ON POST-PRISON EARNINGS

5.1 Introduction

A human capital regression was estimated to identify the variables determining the average post-prison legitimate earnings of the men in the sample. This longitudinal follow-up on income streams extended up to six years for some inmates. Due to the exclusion of illegitimate earnings (see Chapter 3) the results of this analysis may underestimate the true impact of vocational training if training primarily helped the trainees become more proficient criminals.

5.2 Procedure

The equation estimated was of the linear form:

$$Y_{bi} = a_o + bAGE_i + cAGE_i^2 + dEDUC_i + fEDUC_i^2 + \sum_{k=1}^{16} g_k Z_{ki} + \sum_{j=1}^{7} h_j X_{ji} + \sum_{\ell=1}^{5} m_l Y_{a_{li}} + e_i$$

for the ith individual, where

Y_b = Average post-prison annual wages and salaries recorded in the SSA Lifetime Earnings File, rounded to the nearest dollar

Y_a = Pre-training annual wages and salaries recorded in the SSA Lifetime Earnings File for five years prior to incarceration, rounded to the nearest dollar

a_o = Constant term

Z_k = Control variables

X_j = Training related variables

e = Error term.

Three versions of the equation were developed. The training variables were represented by a single variable for trainee or control in Regression #1, and then the specific training program characteristics were added in Regression #2. Finally, the trainee-control variables in Regression #2 were replaced by the five vocational training categories to estimate Regression #3.

5.3 Variables in the Regressions

Two sets of variables were included in the regressions: vocational training program variables, and variables controlling for pre-prison and prison experience characteristics (see Appendix). All of the variables except the income data are the same as those employed in the recidivism analysis discussed in Chapter 4. The training variables in the regressions are listed in Table 5.1. It should be noted, as discussed in Chapter 1, that the expected signs of these variables are ambiguous because training may improve both lawful and unlawful skills.

Table 5.1. The Training Variables in the Human Capital Regressions

Training Variables

1. Completed One Vocational Program (1 = completed one or more programs, 0 = otherwise)
2. Enrolled Seven Months or More (1 = seven months or more; 0 = six months or less)
3. Vocational Training Program Categories (1 = training program category; 0 = otherwise)
4. Vocational Trainee (1 = vocational trainee, 0 = control)

The non-income control variables were coded the same as in the recidivism analysis except that drug and alcohol abuse were combined in one variable in the human capital regressions. The number of variables employed in the human capital regressions also had to be more limited to conform to the SSA computerized regression estimation program. The analysis was based on 764 cases.[1]

The income data were selected from the Social Security Administration's Lifetime Earnings Record File (see discussion in Chapters 2 and 3). Variables measuring each of the five years of pre-prison income earned prior to incarceration were added separately to the equation. The post-prison income was measured as the average income earned in each twelve month period the ex-offender stayed out of prison following his release date through December, 1974.

5.4 Estimation Results

The results of the estimation of the training variables in the human capital regressions are given in Table 5.2 (see Appendix for the estimation results of the control variables). The t-statistics for each regression coefficient are given in the parentheses under the coefficient. Significant variables are defined as those with a t-statistic of 1.282 or larger in a one-tailed test. The mean level of the average annual post-prison income for the sample was $3223 with a standard deviation of $5512.

The large standard deviation of the average annual post-prison income reflects the non-normal distribution of the dependent variable. As indicated in Table 3.5, 24% of the sample had zero recorded income, 22% earned income ranging from $1 to $1200, and 4% earned incomes greater than $10,801. The distribution has two consequences for the estimations presented below. First, the R^2 of the regressions will be underestimated. Second, although the estimators of the coefficients are the best unbiased estimators available, they will be less precise than those estimated using a normal population. As a consequence, the significance of the independent variables may be underestimated by the t-statistics.

Table 5.2 indicates that the only training variable in the three regressions with a significant positive impact on post-prison income is professional programs in Regression #3. In contrast, the operatives training program in

Table 5.2. Empirical Results for the Training Variables in the Human Capital Regressions[a]

	Regression #1	Regression #2	Regression #3
R^2	.1286	.1311	.1434
$\bar{R}^2$	.0979	.0980	.1059
Training Variables[b]			
Completed One Vocational Program	--	222.6617 (.3263)	830.4422 (1.1820)
Enrolled Seven Months or More	--	-866.9387* (1.4409)	-1676.6663*** (2.4287)
Vocational Trainee	-244.6141 (.6214)	699.9961 (.7298)	--
Vocational Training Category			
Clerical	--	--	337.5075 (.2195)
Craftsmen	--	--	-976.4310 (1.2570)
Operatives	--	--	-959.7460* (1.3400)
Professional	--	--	1465.3431** (1.9924)
Service Workers	--	--	-527.5628 (.6389)

[a] The control variables included in the regressions are given in the appendix.

[b] *** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

Regression #3 and enrolled seven months or more in Regressions #2 and #3 had a significant negative impact on post-prison income. These training program results are consistent with those discussed in Chapter 4, but the program length variable contradicts the recidivism results (see discussion below).

The insignificance of the trainee variable in Regressions #1 and #2 is consistent with the findings of two previous studies of Michigan offenders. Borus and Terry[2] found vocational training during a prison sentence markedly insignificant for parolees when regressed on total gross earnings per week out of prison. Hardin[3] estimated six human capital regressions with numerous variables and found that human capital differences had virtually no explanatory power relative to the rate of pay received by parolees. However, when the vocational training experience is divided into specific training program categories as in Regression #3, a different picture emerges in which professional and operative programs have a significant impact on post-prison income. This suggests that the impact of training can be most effectively measured by using the type of vocational program studied rather than by a single trainee-control variable which masks a diversity of training experiences.

In order to evaluate the impact of the vocational programs on trainee subgroups, the results of Regression #3 were used to construct Tables 5.3 and 5.4. Each cell in

the tables contains the estimated coefficient, the t-statistics in parentheses, and the number of men in the cell. The estimates of the variance of the coefficients for the trainee subgroups used to calculate the t-statistics were calculated using the variance-covariance matrix for the estimated regression coefficients. In addition, Table 5.3 assumes that the absolute effect of the program impact is the same for all training programs. However, as discussed above, this is unlikely, but the direction of the bias which may result is uncertain.

A review of the impact of vocational training on post-prison earnings by program characteristics given in Table 5.3 supports the recidivism findings discussed in Chapter 4: only professional training programs have a consistent and significant measured impact which improves the post-prison employment position of an ex-offender. However, it is impossible to use these results to determine the extent to which the estimated coefficients are measuring the true program impact rather than the motivational self-selection of the trainees. Those trainees with vocational goals and the relatively high levels of education required for enrollment in the professional programs would be more interested in the potential legitimate earnings gain of these programs, and therefore would actively seek enrollment in these programs. In contrast, men enrolled for avocational purposes rather than vocational goals would be more likely to seek out the more traditional training

Table 5.3. Vocational Training Program Impact on Post-Prison Earnings by Program Characteristics, in dollars

Program Characteristics[a]	Training Program Category PROF	CLER	OP	SERV	CRFTS	Totals
Completer, enrolled 6 months or less, no HS degree[b]	***2295.7853 (2.6387) 9	1167.9497 (.7264) 1	- 129.3038 (.1898) 48	302.8794 (.4979) 73	- 145.9888 (.2247) 54	185
Completer, enrolled 6 months or less, HS degree	***3222.4841 (3.1302) 3	*2094.6485 (1.2835) 2	797.3950 (.9116) 8	*1229.5782 (1.5142) 7	780.7100 (.8892) 6	26
Completer, enrolled 7 months or more, no HS degree	619.1190 (.8417) 36	- 508.7133 (.3056) 2	**-1805.9701 (2.1840) 15	-1373.7869 (1.0518) 8	**1822.6551 (2.4891) 31	92
Completer, enrolled 7 months or more, HS degree	**1545.8178 (1.7429) 17	-----	- 879.2713 (.9111) 9	- 447.0881 (.3208) 8	- 895.9563 (.9826) 8	42
Non-completer, enrolled 6 months or less, no HS degree	**1465.3431 (1.9924) 21	337.5075 (.2195) 3	*- 959.7560 (1.3400) 17	- 527.5628 (.6389) 2	- 976.4310 (1.2570) 8	51
Non-completer, enrolled 6 months or less, HS degree	***2392.0419 (2.6906) 7	1264.2063 (.8188) 5	- 33.0472 (.0379) 2	399.1360 (.3617) 1	- 49.7322 (.0524) 2	17
Non-completer, enrolled 7 months or more, no HS degree	- 211.3232 (.2834) 10	-----	-----	-----	-2653.0973 (1.0022) 1	11
Non-completer, enrolled 7 months or more, HS degree	715.3756 (.8265) 2	-----	-----	-----	-----	2
Totals	105	13	99	99	110	426

[a] *** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

[b] HS degree refers to the completion of a high school diploma or receipt of a high school equivalency diploma as the result of passing the GED exam while incarcerated.

programs, or to accept enrollment in any program with an opening since the specific skills learned are not of importance to these trainees. In addition, the potential for using the skills learned in the traditional training programs in lawful employment is more limited since the shorter training periods combined with the age of the equipment used in the training limit the extent to which the trainee can master even minimal entry level skills, and the demand for these skills has grown at an average or below average rate.

Table 5.3 indicates that the professional programs are outstanding for their large positive impact on average annual post-prison income for trainee subgroups accounting for approximately 54% of the professional trainees; the impact is highly significant for subgroups accounting for 18% of the professional trainees. The latter group shares the single common characteristic of being enrolled six months or less. It is not clear how much of the income gain is due to lower rates of unemployment as compared with increases in the wage rates received.

The impact of the other significant training program categories in Table 5.3 generally decreases the average annual post-release income. However, there are two exceptions. A significant positive impact on income was found for men who completed a clerical or service program who were enrolled six months or less, and who completed a high school degree or passed the GED examination while

incarcerated; the coefficient on the former variable was only marginally significant. A comparison of these two groups with their counterparts who completed a training program and were enrolled six months or less but who did not receive a high school degree or its equivalent suggests that the high school degree rather than the vocational training contributed to their higher post-prison income. The large difference between high school and non-high school completers is also apparent among the professional trainees. This may reflect employment practices in which paper credentials serve as proxies for desired employee characteristics.

Two final considerations should be noted in the review of Table 5.3. The coefficients for the clerical training programs are insignificant. This may reflect the small size of the sample rather than any deficiencies in the program per se. In addition, as discussed in the Appendix, the income gain for whites in this sample is significantly larger than for non-whites. This earnings differential reflects hiring practices in the labor market.

Despite the general consistency of the training program category findings in Tables 4.3 and 5.3 which support the argument that professional training programs improve lawful employment opportunities, there are two marked differences in the subgroup results. First, trainee subgroups accounting for 54% of the professional trainees

experienced significant measured gains in income while trainee subgroups accounting for 61% of the trainees experienced significantly reduced rates of recidivism. However, trainee subgroups accounting for only 45% of the program completers had measurable income gains while trainee subgroups accounting for 98% of the program completers experienced reduced rates of recidivism. Two explanations are possible. Reductions in recidivism cannot be explained entirely by income gains. This is consistent with the discussion of professional trainee motivation to "go straight" in Chapter 4. Alternatively, non-completers in the professional programs are relatively more attractive as employees than completers and non-completers in the other training programs due to the higher educational achievement level necessary to enroll in the professional programs. Consequently, it may be possible for them to develop enough skills in conjunction with their educational level to improve their employment opportunities and earnings even though they fail to complete the program. However, they are not able to improve their income enough to match their unrealistic aspirations, and resort to unlawful activities as a supplement to their lawful income. They therefore travel on the zigzag path between criminal and lawful activities.

The second difference in the subgroup results is the differential impact of being enrolled seven months or more which decreases the probability of recidivism by only

1% but decreases the post-prison earnings by $1677. It is unclear why this inconsistency occurs. There are two possible explanations. This may be the result of the specification of the variable. As noted in section 5.3 the SSA regression format limited the number of variables that could be included, so the variable measuring the length of time enrolled was retained, while that measuring enrollment in two or more programs was omitted. As a consequence, the enrollment for seven months or more may be also serving as a proxy for enrollment in two or more programs, resulting in the unexpected sign on the coefficient. Alternatively, the explanation for the impact of enrollment for six months or less may be the same as that presented above for the non-completers: they learned enough skills to improve their earnings but did not develop a commitment to pursuing the occupation in which they trained after release or realizing a lawful way to compromise their aspirations and their abilities.

Interaction terms were added to Regression #3 in order to determine whether the professional program impact might have been fortuitously reflecting the year in which the trainees were released. The results are given in Table 5.4. None of the release years 1970 through 1973 had a significant impact on post-prison earnings as compared with the base year of 1969. It is not clear why the significant result is found only in 1969, but it may reflect an impact of the Michigan economy on the employment pattern of

Table 5.4. Professional Training Program Impact on Post-Prison Earnings by Year of Trainee Release, in dollars

Year Released	Program Impact	Year Released	Program Impact
1969	5223.6885*** (3.8270) 19	1972	1118.2131 (.3991) 23
1970	1892.4311 (.8747) 26	1973	3109.6918 (.8520) 7
1971	1281.5084 (.5167) 30		

*** Significant at the 1% level.

ex-offenders which could not be fully reflected in the variable measuring the unemployment rate at the time released. Even skilled ex-offenders have difficulty finding and maintaining employment under the best economic conditions, and frequent job changes occur after release as the men search for better paid and/or more satisfactory jobs in terms of promotion opportunities and job security.[4] In 1969 the Michigan civilian unemployment rate was 4.1%, which ensured that conditions prevailed in which job changes could be made with short periods of unemployment, and that relatively large gains in wages might occur as well for professional trainees with skills demanded by employers. However, in subsequent years the unemployment rate was much higher, averaging 7.25% from 1970-73, so that the potential for large improvement in employment opportunities was much more limited. It should be noted that the lack of significance of the 1973 coefficient may be due to the relatively short follow-up period for the men released in 1973 as compared with those released from 1969-72.

5.5 Conclusions About the Training Variables

Most prior research on prison vocational training programs has focused on the impact of recidivism with little, if any, attention given to the impact on legitimate post-prison earnings. The present research, however, has evaluated the impact of prison vocational training on

earnings and demonstrated that professional trainees in the sample studied experienced large significant gains in post-prison income as compared with the controls and other trainees. However, the relative importance of more stable employment as compared with higher wage rates, and trainee motivation as compared with true program impact, remains ambiguous. It should be noted that the impact of the training experience might have been larger if the unemployment rates had been lower during the period studied. In addition, the results indicate that for some trainees the most important factor in their prison education experience may not be the type of vocational training received, but rather the use of that training as credits toward the completion of a high school diploma or the incentive which the training may provide to earn a high school equivalency certificate.

APPENDIX

THE CONTROL VARIABLES IN THE HUMAN CAPITAL REGRESSIONS

5.6 Estimation Results of the Control Variables

The expected signs of the control variables, based on the discussion in the appendix in Chapter 1, are given in Table 5.5. The estimation results of the pre-prison and prison experience control variables are given in Table 5.6.

The expected signs were found for all the significant pre-prison control variables except married. The variables measuring white, average grade rating (Regression #2 only), and income earned the first, third, and fifth years before incarceration were significant and increased average post-prison income. All of the variables except income the third year before incarceration were highly significant at the 1% level in Regression #3. Only the coefficient for white was relatively large.

The sign of the variable measuring white was consistent with the expectations of higher income gains for white as compared with non-white members of the sample, and reflects the characteristics of labor market hiring practices. However, the sizeable differential between the whites and non-whites suggests that a prison record may be a greater handicap for non-white as compared with white ex-offenders seeking jobs in the legitimate labor market.

Table 5.5. Expected Signs of the Control Variables in the Regressions

Pre-Prison Control Variables

1. (+) Age at release
2. (-) Age^2
3. (+) Years of Formal Schooling completed, by two year periods
4. (-) Years of Formal Schooling Completed[b]
5. (+) Average Grade Rating
6. (+) Race (1 = white; 0 = otherwise)
7. (+) Marital Status (1 = married; 0 = otherwise)
8. (-) Age at First Attention of Authorities (1 = 14 or less; 0 = otherwise)
9. (-) Number of Prior Jail and Prison Terms
10. (-) Type of Crime (1 = economic; 0 = otherwise)
11. (-) Prior Drug or Alcohol Abuse (1 = problem usage; 0 = otherwise)
12. (+) Income Prior to Incarceration
    Fifth Year Before Incarceration
    Fourth Year Before Incarceration
    Third Year Before Incarceration
    Second Year Before Incarceration
    First Year Before Incarceration

Prison Experience Control Variables

13. (+) Time Passed Since Release, in quarters (time between release date and Dec. 1974)
14. (+) Passed GED or Earned High School Diploma (1 = yes; 0 = no)
15. (?) Rate of Unemployment in Michigan During Quarter Released
16. (?) Year Released
    1970 (1 = 1970; 0 = otherwise)
    1971 (1 = 1971; 0 = otherwise)
    1972 (1 = 1972; 0 = otherwise)
    1973 (1 = 1973; 0 = otherwise)
17. Prison Location
    (-) Michigan Reformatory
    (+) Michigan Training Unit

Table 5.6. Control Variables in the Human Capital Regressions

Pre-Prison Control Variables	Regression #1	Regression #2	Regression #3
Age at Release	75.6245 (.3604)	82.6716 (.3939)	75.7539 (.3609)
Age^2	- 1.8284 (.6298)	- 1.9184 (.6606)	- 1.8905 (.6512)
Years of Formal Schooling Completed	-803.8733 (.7679)	-802.2366 (.7664)	-613.0496 (.5860)
Years of Formal Schooling $Completed^2$	66.1037 (.5930)	66.5629 (.5971)	41.0554 (.3683)
Average Grade Rating	129.8389 (1.1971)	149.6007* (1.3672)	124.8937 (1.1387)
White	922.4138** (2.1925)	909.4420** (2.1577)	1016.3984*** (2.4128)
Married	-684.5305* (1.4110)	-678.5786* (1.3984)	-654.2999* (1.3502)
Age at First Attention of Authorities: 14 or less	37.6455 (.0808	15.8103 (.0339)	7.0871 (.0152)
Number of Jail and Prison Terms	- 96.0603 (1.1143)	- 94.9358 (1.1013)	- 82.4786 (.9598)
Economic Crime	-428.1163 (1.0512)	432.8575 (1.0629)	-399.2377 (.9849)
Prior Drug or Alcohol Abuse	-182.9883 (.4499)	-170.6243 (.4188)	-145.2985 (.3576)
Income Fifth Year Before Incarceration	.5103*** (2.5185)	.5064*** (2.4913)	.5887*** (2.8821)
Income Fourth Year Before Incarceration	- .1493 (.6630)	- .1507 (.6689)	- .2202 (.9765)
Income Third Year Before Incarceration	.2694* (1.3629)	.2637* (1.3336)	.2959* (1.4963)
Income Second Year Before Incarceration	- .1395 (.8400)	- .1335 (.8025)	- .1256 (.7562)
Income First Year Before Incarceration	.6453*** (4.6955)	.6575*** (4.7757)	.6437*** (4.6804)

Table 5.6. continued

Prison Experience Control Variables	Regression #1	Regression #2	Regression #3
Time Passed Since Released, in quarters	154.9404 (.8675)	151.7889 (.8489)	156.4838 (.8714)
Passed GED exam or Earned High School Diploma	937.9134** (1.6767)	1016.9506** (1.8074)	926.6988* (1.6265)
Rate of Unemployment in Michigan	- 1.2450 (.2975)	- 1.3649 (.3258)	- 1.8373 (.4405)
Released in 1970	-467.9375 (.3545)	-421.1779 (.3189)	-309.9441 (.2352)
Released in 1971	96.1732 (.0521)	103.1898 (.0559)	198.6219 (.1076)
Released in 1972	434.8075 (.1970)	454.3555 (.2057)	583.7749 (.2635)
Released in 1973	1720.0746 (.6261)	1704.5499 (.6194)	1881.8496 (.6812)
Prison Location Michigan Reformatory	499.9319 (.4777)	578.0050 (.5516)	1094.8188 (1.0296)
Michigan Training Unit	-929.7453 (1.2358)	-941.9203 (1.2495)	-973.6881 (1.2699)
Constant	1244.2774 (.1971)	183.0310 (.0288)	1065.5907 (.1672)

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

The variable measuring married had a significant and relatively large negative impact on post-prison income. It is not clear why married men experienced lower incomes after release since married men are expected to be more stable members of the labor force than single men. Two explanations of this result may be suggested. The married men in the sample could have been supported by their wives after release. This support might have reduced the pressure on them to work at any available job, and therefore afforded them the option of remaining unemployed longer while being more selective about their employment. Alternatively, the pressures of supporting a family on the relatively low incomes usually earned by ex-offenders may have encouraged them to put their efforts into illegal activities with fast returns, such as drug peddling, at the expense of their legitimate jobs.

The prison experience control variable passed the GED exam or earned a high school diploma while in prison had a significant positive effect on post-prison income. The effect was relatively large. This is consistent with expectations of higher earnings for high school graduates as compared with men with less than a high school education.

5.7 Conclusions about the Control Variables

The pre-prison and prison experience control variables complement the vocational training variables in an explanation of the factors contributing to post-prison

income. Highly significant influences were race, (Regression #3 only) and income the first and fifth years before incarceration. Variables significant at the 5% level were race (Regressions #1 and #2) and passed the GED exam or earned a high school diploma.

FOOTNOTES

1. 772 cases were sent to the SSA. Eight of the cases were dropped by the SSA leaving a sample of 764. Six cases were lost because the SSA members were not found in the Lifetime Earnings File, and two cases were out of the proper range of years.

2. Borus and Terry regressed the variables age, education, education X age, years worked, whether vocationally trained, the number of dependents, disabled, race, drug use, commission of a violent crime, years since sentencing, the number of prior prison terms, and whether paroled from a corrections center or other halfway house on total gross earnings per week out of prison. Significant positive coefficients were found for released from a corrections center or halfway house and having several dependents. A significant negative coefficient was found for the black race. See Michael E. Borus and Patterson A. Terry, An Evaluation of the Michigan Comprehensive Offender Manpower Program (COMP), submitted by the School of Labor and Industrial Relations, Michigan State University, to the Michigan Department of Corrections, Oct. 1, 1974.

3. Hardin estimated six human capital equations to explain the starting pay of new parolees. The first equation showed that the receipt of vocational training, the level of education completed, and work experience were not significant. Only the occupation held before prison was significant. The second, third, and fourth equations included sets of other factors which might explain starting pay. Equation two included IQ, average grade rating, and race; equation three, marital status and number of dependents; and equation four, number of previous prison sentences, crime type, place paroled from, and race. All of these variables were insignificant. Equation five included the variables prior occupation, race, number of previous prison sentences, and crime type which had been significant or near-significant in the previous equations. Only prior occupation and number of previous prison terms were found to be barely significant. In the last equation education and education squared, receipt of vocational training, years of work experience and years of work experience squared were added to equation five but none of these variables were significant. Hardin's explanation of his results is that new parolees are concentrated in secondary labor markets where their human capital and ability are of little economic

importance within wide ranges. See Einar Hardin, "Human Capital and the Labor Market Success of New Parolees," American Statistical Association Proceedings (1975), pp. 330-335.

4. For further discussion of the employment patterns of ex-offenders see George A. Pownall, Employment Problems of Released Prisoners (Wash., D.C.: U.S.D.O.L., M.A., 1969).

CHAPTER 6

BENEFIT/COST ANALYSIS OF VOCATIONAL TRAINING PROGRAMS

6.1 Introduction

The results discussed in Chapters 4 and 5 indicate that professional vocational training programs have a significant and large impact which decreases the probability of recidivism and increases the expected average annual post-prison legitimate earnings. However, because the other training programs generally failed to have a favorable impact on ex-offender recidivism and earnings after release, the benefit/cost ratios for the whole trainee group cannot be estimated. As a consequence, the returns to the investment in human capital have been estimated for only the professional programs to provide a measure of the benefits of successful training from the perspective of the individual trainee, the taxpayer, and society based on recidivism and program cost estimates for 1973 for the SPSM.

The methodology of benefit/cost analysis as applied to manpower programs has been well developed.[1] It is expected that the benefits will be underestimated in this study due to two factors. The analysis must be limited to those benefits which can be measured in dollars. In addition, the benefits exclude gains in illegitimate

income due to training. The assumptions employed in the data calculations were selected with the objective of generating conservative benefit/cost ratios.

Due to the difficulty in reconstructing past expenditures on vocational training, 1973 was selected since it was the last year during the release period studied. The 1973 average nominal costs should have been higher than those of previous years. Consequently, if it could be determined that benefits were greater than costs in 1973, the investment in professional training would clearly be justified for this group of men.

The benefit/cost ratios were estimated only for the SPSM. Although the average cost of incarceration at the SPSM was lower than for the MTU or MR,[2] no clear pattern of differences in the cost of vocational training could be determined from the available data. Since about 79% of the sample was incarcerated at the SPSM, its costs would be fairly representative of those of the total sample. If there are economices of scale in the provision of training at the SPSM due to the relatively large educational program, then the cost estimates will be underestimated.

6.2 The Individual Benefit/Cost Ratios

The individual benefit/cost ratio measures the private return to the inmate enrolled in a professional training program. It is calculated by dividing the

decrease in disposable income lost while in training into the discounted benefits of training. The benefits of training are measured by the additional annual disposable post-prison earnings received by the professional trainees as compared with the other trainees and the controls.

The annual gains in disposable earnings were calculated for single trainees who constituted approximately 78% of the sample, and for married trainees with a wife and two children who constituted about 7% of the sample. We employed a tax rate of 20% based on Pechman and Okner's estimate that the effective tax rate paid for federal, state, and local taxes by individuals with incomes similar to those of the sample is a proportional tax of 20% to 25%.[3] The estimation of the change in public assistance payments was more difficult due to the diversity of programs and the determination of eligibility based on family income. However, after adjusting for probable income ranges it was determined that both the single and married trainees would loose approximately $32 in public assistance for each additional $100 earned. Consequently, program completers enrolled six months or less experienced an average annual gain in post-prison disposable income of $1102; program completers enrolled seven months or more, $297; and non-completers enrolled six months or less, $703.[4]

The choice of the most appropriate service life and discounting method to employ in the benefit calculations

is not obvious due to two considerations which emerge from a review of follow-up studies of training covering at least a five year period.[5] It is clear that the income gains from training accrue for at least five years, but it is uncertain how much longer the benefits will be received. Consequently, the subsequent tables employ a service life of five and ten years to provide a range of estimates. The five year service life will underestimate the actual benefits, while the ten year service life may accurately measure or overestimate the benefits. Furthermore, the expected rate at which the benefit stream from training accrues over time has not been established. The research by Hu, Lee, and Stromsdorfer, and by Borus suggest that the annual benefits accrue at an increasing rate, while Ashenfelter suggests a decreasing rate. Consequently, due to this uncertainty, a constant rate of discount has been used for simplicity. This approach will underestimate the benefits if they increase at an increasing rate and will overestimate them if they increase at a decreasing rate.

The discounted benefits of professional training are shown in Table 6.1. Since the income gains to non-completers enrolled seven months or more were insignificant

Table 6.1. Individual Benefits from Professional Training by Program Characteristics

	Completer, Enrolled 6 months or less		Completer, Enrolled 7 months or more		Non-Completer, Enrolled 6 months or less	
Discount Rate	5 years	10 years	5 years	10 years	5 years	10 years
5%	$ 4766	$ 8497	$ 1284	$ 2290	$ 3040	$ 5420
10%	4180	6776	1127	1826	2667	4322
15%	3696	5533	996	1491	2358	3530

they have been omitted from this and all subsequent tables. The smallest return of $996 accrued over a five year period discounted at 15% to trainees enrolled seven months or more while completing the program. The largest gain of $8497 accrued over a ten year period discounted at 5% to trainees enrolled six months or less while completing the program.

The private cost of training to the inmate varies with the reason he enrolled in the program. For those inmates who enroll because vocational training is the preferred way of "doing time," who hope to impress the parole board, or who want to receive veterans educational benefits, the cost of training may be negative. For those inmates who gave up the opportunity of working in prison industries, the sacrifice of lost income can be substantial.[6] However, for most inmates the alternative income opportunities are academic educational programs, or institutional jobs in the prison; in 1973 these

alternatives paid the same wage of 25¢ per day or $5 per month as the vocational training program. Consequently, since the average inmate paid none of his educational expenses and did not sacrifice any income while in training, the private opportunity costs of training are zero.

Since the private costs of training are zero, a benefit/cost ratio cannot be estimated. However, Table 6.1 indicates that there is a measured positive private return to the professional program trainee. This return is underestimated because it does not include the increased illegitimate income which may have resulted from training.

6.3 The Taxpayer Benefit/Cost Ratios

The taxpayer benefit/cost ratio measures the percentage of the program costs returned to the taxpayers who paid for the programs. The assumption on which this analysis is based is that the cost of supporting a man in prison is a sunk cost which must be paid regardless of whether he enrolls in vocational training or not. The focus, therefore, is on the extra expense of providing vocational training as compared with the benefits of that training. The costs of training are the costs of operating the SPSM vocational school. The benefits of vocational training to the taxpayer are the increased taxes paid, the reduction in welfare and unemployment benefits received, and the reduction of future recidivism-related expenses in the form of arrest, trial,

and confinement, as well as property loss or other costs of criminal activity.

In order to determine the cost of operating the vocational school at the SPSM it was necessary to construct an approximate budget based on information from interviews with the school staff and school file information. This approach was required since the expenditure records of the Department of Corrections and the prison are maintained for the convenience of accountants rather than researchers. In particular, four problems emerged which posed difficult barriers to collecting information. First, the prison records lump the expenditures for the academic and vocational schools (K-12) together. Second, numerous items are placed under unlikely accounting codes for record keeping purposes. In order to ferret out the desired information, therefore, it is necessary to look at receipts to find the ones of interest. All receipts, however, are destroyed after the triennual audit, so no receipts were available for the period prior to 1974. Third, some expenses, such as state educational aid funds, are not included in the Department of Corrections records. Finally, the problems discussed above precluded the estimation of the marginal cost of training; only average costs could be determined.

The estimated expenditures for the vocational school in 1973 are shown in Table 6.2. The average cost of

Table 6.2. Estimated SPSM Vocational School Expenditures in 1973

Expenditure	Total Cost	Average Cost*
Salaries & Wages	$ 217,016	$ 309
Fringes	34,372	49
Supplies	5,000	7
Building & Equipment Rent	18,167	26
Total	$ 274,555	$ 391

* Based on the 1972-73 vocational enrollment of 702 students

providing vocational training was $391. There are four sets of expenditures. Salaries and wages cover twelve vocational teachers, one administrator, one guard, 50% of the salary of the vocational counselor at the Reception and Guidance Center and vocational education consultant in the main office of the Department of Corrections in Lansing,[7] and 25 inmate clerks used as teachers aides in the vocational classrooms and for clerical work for the vocational school and its teachers. It is doubtful that all administrative overhead has been adequately covered in this item, so it is probably somewhat underestimated. Fringes include longevity, insurance, and retirement. This was estimated as 16% of salaries and wages. The percentage was based on an average of 16% of salaries and wages paid at the SPSM from 1971-74. The inmate clerks are not covered with fringe benefits.

The annual allocation for supplies and materials was about $5000, but the full allocation was seldom received for use in the vocational school. However, this is probably an underestimate of actual expenses since no allowance is made for the costs of electricity and telephones.

The rent for building space and equipment includes maintenance, depreciation, and replacement costs. The building rent was estimated using the lowest rent for comparable floor space, building age and condition, and location as the prison in the Jackson area in 1977, deflated by the C.P.I. The value of the equipment rental was estimated at about one-third of the rent of the building space.[8] This allowance for depreciation of equipment may be too generous since vocational schools in prisons use equipment until it cannot be repaired or becomes obsolete. The equipment is kept, therefore, long after it has been fully depreciated.

The wages received by vocational trainees were excluded from the cost of training since the average trainee would have been earning the same wages elsewhere in the institution. No attempt was made to subtract the value of goods and services produced by the trainees from the costs of their training since the value of output varies with the vocational program and it is difficult to place a value on the inmates' services.

The benefits to the taxpayer from professional vocational training can be measured in three ways: increased tax receipts, decreased welfare and unemployment insurance payments, and decreased recidivism-related costs. The available data did not permit the estimation of savings in unemployment insurance. The increased tax receipts and decreased public assistance payments were estimated as discussed in section 6.2. The resulting benefits are indicated in Table 6.3. The benefits ranged from $1080 for five years discounted at 15% for program completers enrolled seven months or more to $9206 for ten years discounted at 5% for program completers enrolled six months or less.

Table 6.3. Taxpayer Benefits due to Increased Tax Payments and Reductions in Public Assistance Payments, by Program Characteristics

	Completer, Enrolled 6 months or less		Completer, Enrolled 7 months or more		Non-Completer, Enrolled 6 months or less	
Discount Rate	5 years	10 years	5 years	10 years	5 years	10 years
5%	$ 5163	$ 9206	$ 1392	$ 2483	$ 3295	$ 5875
10%	4529	7341	1222	1980	2891	4685
15%	4005	5995	1080	1617	2556	3826

In addition to estimating the benefits shown in Table 6.3, it is possible to calculate the minimum tax receipts which will just pay for the cost of the training. The

discounted minimum tax receipts for programs lasting six and twelve months are indicated in Table 6.4 for five and ten year periods at 5%, 10%, and 15% discount rates. The addition to income which will generate these tax receipts at an effective tax rate of 20% is also given.

Table 6.4. The Taxpayers' Breakeven Tax Receipts, by Program Length

	Program Length			
	6 Months		12 Months	
Discount Rates	5 Years	10 Years	5 Years	10 Years
5%				
Tax Receipts	$ 45	$ 25	$ 91	$ 52
Addition to Income	225	125	455	260
10%				
Tax Receipts	52	32	103	64
Addition to Income	260	160	515	320
15%				
Tax Receipts	59	39	117	78
Addition to Income	295	195	585	390

Table 6.4 can be used to compare the estimated returns from training among the trainee subgroups. For example, in Table 5.3 the lowest positive but statistically insignificant return to training accrued to service workers who completed a program while enrolled six months or less but did not earn a high school degree. Although the return to training was not large, it is apparent from Table 6.4 that the taxpayer received a small net benefit from this training. It is also clear that those programs which reduced income generated no tax benefits for the taxpayer.

However, for some groups, such as operative trainees who did not complete a program while enrolled six months or less and did not earn a high school degree, the burden imposed on the taxpayers was fairly small.

It is difficult to measure accurately the gains from the reduction of recidivism due to vocational training because the specific patterns of recidivism which the trainees would have demonstrated without training are uncertain. We do not know the number of crimes deterred, including those in which the ex-offender would be caught, as well as those which would be committed without detection. As a consequence two assumptions are employed. First, the training prevented only one crime from being committed, which may underestimate the actual deterrent impact of the training on criminal activity. Second, the criminal was caught and sentenced to prison for the crime perpetrated. This overestimates the cost imposed on the criminal justice system because an arrest may result in several less expensive outcomes, including release due to insufficient evidence or on probation after guilt has been established.[9]

Much of the cost of the criminal justice system consists of fixed cost components, while the costs of interest are the marginal costs resulting from the arrest of an additional offender. However, in contrast to the treatment of the costs of operating the vocational school, the use of average costs to estimate recidivism-related savings

would result in gross overestimates. Consequently, an attempt is made to estimate the marginal costs of a reduction in recidivism. These estimates are crude due to data limitations and the problem of defining the output produced by the various components of the criminal justice system.[10] The estimated cost of recidivism in 1973 consists of three parts as indicated in Table 6.5: the cost of the crime committed, the costs of processing the man through the criminal justice system excluding incarceration, and the cost of imprisonment.

The best data on the cost of crime are available for the Index crimes larceny, theft, robbery, and burglary. While these may provide underestimates for other types of crimes, such as crimes of violence leading to medical expenses due to physical injury, they constitute most of

Table 6.5. The Cost of One Recidivist Returned to the SPSM in 1973

Type of Expense	Expenditure
Cost of One Crime	$ 517
Criminal Justice System Expenditures Excluding Incarceration	567
Cost of Incarceration at the SPSM	647
Total	$ 1731

the reported Index crimes in Michigan. The cost of crime was calculated using a weighted average of these Index

crimes in 1975, deflated by the C.P.I.[11] This estimate was approximately $517.

The cost of the criminal justice system processing, excluding incarceration, was approximately $567. This is an overestimate of the true marginal cost because it includes the marginal cost of the police detective time spent on Index crimes plus an average cost estimate of the other phases of processing of the offender.[12]

The marginal cost of incarceration at the SPSM for an average sentence of fourteen months was approximately $647. Although the incarceration covers more than one year, the expenditure was treated as though it occurred in one year. This marginal cost estimate primarily reflects the changes in expenditures to provide food, clothing, and various services, such as laundry and health care. Little change would be expected in the provision of most rehabilitative programs due to space limitations. The estimate was calculated as 13% of the average cost per inmate in 1973 since the change in the average annual cost per inmate from 1970 to 1973 averaged 13%.

Table 6.5 indicates that the estimated cost of one recidivist to the SPSM in 1973 was approximately $1731. The discounted benefits received by the taxpayers from the reduction of recidivism are indicated in Table 6.6. These benefits range from $5806 for five years discounted at a 15% rate to $13,346 for ten years discounted at a 5% rate.

Table 6.6. Taxpayer Benefits Due to the Reduction Recidivism

Discount Rate	5 Years	10 Years
5%	$ 7,486	$ 13,346
10%	6,566	10,643
15%	5,806	8,691

The taxpayer benefit/cost ratios are indicated in Table 6.7. The ratios were estimated by dividing the discounted sum of the benefits due to the increased tax receipts and reduction of recidivism and public assistance payments by the cost of the training program. The cost of providing the vocational program indicated in Table 6.2 was cut in half for the trainees enrolled six months or less. Table 6.7 shows that the provision of the professional programs clearly benefited the taxpayers even for a five year period. The taxpayer gains were particularly large when the recidivism-related benefits are added to the other benefits.

6.4 The Social Benefit/Cost Ratios

The social benefit/cost ratio measures the change in productive capacity accruing to society as a whole from the investment in vocational training. The analysis assumes no secondary effects due to the displacement of other workers by trainees. It is probable that some displacement did occur during the relatively high unemployment in Michigan from 1970 to 1973. Consequently, the social benefits will

Table 6.7. Taxpayer Benefit/Cost Ratios by Program Characteristics, to nearest whole number

A. Benefit/Cost Ratios based on Increases in Tax Payments and Reductions of Public Assistance Payments

	Completer, Enrolled 6 months or less		Completer, Enrolled 7 months or more		Non-Completer, Enrolled 6 months or less	
Discount Rate	5 years	10 years	5 years	10 years	5 years	10 years
5%	26	47	4	6	17	30
10%	23	37	3	5	15	24
15%	20	31	3	4	13	20

B. Benefit/Cost Ratios Based on Increases in Tax Payments and Reductions in Public Assistance Payments and Recidivism

5%	65	115	23	40	55	98
10%	57	92	20	32	48	78
15%	50	75	18	26	43	64

be overestimated to some extent since the displacement effects cannot be measured.

The social benefits are the discounted sum of the increased production of the trainees as measured by their additional gross earnings (see Table 5.3) and the reduction of recidivism-related costs (see Table 6.6). The social costs include the average cost of $391 per SPSM trainee and the production lost while in training. As discussed above, it is difficult to estimate the value of the lost production while in training due to the variety of alternative jobs in the institution to which the inmate could be assigned and because some production occurs in the vocational training classes. However, to generate conservative estimates, it

was assumed that the average income of $501 earned in employment in prison industries was a crude measure of the lost production even though the prison industry jobs are quite scarce. The benefit/cost ratios for the discounted income streams are shown in Table 6.7; the social costs were adjusted for the length of enrollment. It is clear from parts A and B of the table that society gained from the provision of professional vocational training.

Table 6.8. Social Benefit/Cost Ratios by Program Characteristics, to nearest whole number

A. Benefit/Cost Ratios based on Increases in Earnings

	Completer, Enrolled 6 months or less		Completer, Enrolled 7 months or more		Non-completer, Enrolled 6 months or less	
Discount Rate	5 years	10 years	5 years	10 years	5 years	10 years
5%	22	40	3	5	14	25
10%	20	32	3	4	12	20
15%	17	26	2	3	11	16

B. Benefit/Cost Ratios based on Increases in Earnings and the Reduction of Recidivism

5%	39	70	11	20	31	55
10%	34	56	10	16	27	44
15%	30	45	9	13	24	36

6.5 Conclusion

Benefit/cost analysis as applied here is at best a rough guide to the effectiveness of the investment in human capital through the provision of professional vocational training programs to inmates. However, the size of the benefits as compared with the costs clearly indicates that the expenditures on this training are justified from the perspective of the individual trainee, the taxpayer, and society. It should also be noted that a comparison of the smallest discounted benefit derived by the taxpayers and society from the reduction of recidivism over a five year period as shown in Table 6.6 with the cost of training all the trainees for twelve months indicates that the taxpayers break even when only 12% of the trainees "go straight."

FOOTNOTES

1. For examples, see Michael E. Borus & William R. Tash, Measuring the Impact of Manpower Programs: A Primer (Ann Arbor: Institute of Labor and Industrial Relations, The University of Michigan-Wayne State University, 1970); Einar Hardin & Michael E. Borus, The Economic Benefits and Cost of Retraining (Lexington: D.C. Heath & Co., 1971); Daniel Glaser, Routinizing Evaluation (Rockville, MD: National Institute of Mental Health, 1973); and G. G. Somers & W. D. Wood, ed., Cost-Benefit Analysis of Manpower Policies: Proceedings of a North American Conference (Center for Studies in Vocational and Technical Education, University of Wisconsin, and Industrial Relations Centre, Queen's University, 1969).

2. The average annual cost for the SPSM for the period 1967-74, based on the December 31 prison population, was $194 less than the MTU and $993 less than the MR.

3. Joseph A. Pechman and Benjamin A. Okner, Who Bears the Tax Burden? (Washington, D.C.: The Brookings Institution, 1974), pp. 5 and 62.

4. The available data provided estimates of the value of public assistance received in cash, food stamps, and public housing for the income levels of zero income, $1600, $3200, and $4000 for families and single individuals living in the city of Detroit. The benefits listed were those available in July, 1972, adjusted to 1973 levels by increasing the food stamp benefits.

   Table 3.7 indicates that the average trainee earned $3267 a year after his release from prison. Since single men would be less likely than married men to have access to income earned by others, it would be expected that the range of earnings for single men would be from $1600 to $3200. In this income range an additional $100 of earnings results in a loss of public assistance payments of about $32. A single person earning more than $3200 is ineligible for public assistance, so the gain in disposable income will be understated for trainees ineligible for public assistance.

   In contrast to the single trainees, married men with a wife may have access to additional sources of family income. As a consequence, it is more likely that the

average family income for married trainees will be above $3267. If the family income fell in the range from $3200 to $4000, an additional $100 of income would reduce the amount of public assistance payments by approximately $32. The gain in disposable income will be understated if family income is above this range because changes in income will not have an appreciable impact on the amount of public assistance received. It should be noted that the gain in disposable income for married men with a family income in the range from $1600 to $3200 will be overstated since an additional $100 earned results in a decrease of public assistance payments of about $145.

The loss experienced by married men in the lower income range primarily reflects the elimination of AFDC payments at an income level of $3200. This loss is only partially compensated by increases in general assistance, food stamps, school lunch aid, and public housing assistance. This marked reduction in public assistance payments could provide a strong incentive for minimal use of the skills learned in vocational training programs.

For further details see: U.S. Congress, Joint Economic Committee, Welfare in the 70's: A National Study of Benefits Available in 100 Local Areas, Studies in Public Welfare, Paper #15, 93rd Congress, July 22, 1974, pp. 160-161.

5. The discussion below is based on the following three articles: Orley Ashenfelter, "The Effect of Manpower Training on Earnings: Preliminary Results," (Industrial Relations Research Association Proceedings, 1974), pp. 252-260; Michael E. Borus, "Time Trends in the Benefits from Retraining in Connecticut," (Industrial Relations Research Association Proceedings, 1967), pp. 36-46; and Teh-Wei Hu, Lee Maw Lin, and Ernst W. Stromsdorfer, "Economic Returns to Vocational and Comprehensive High School Graduates," (Journal of Human Resources 6:1 Winter, 1971), pp. 25-50.

6. Only about 20% of the SPSM population holds jobs in the prison industries. Once a man lands a prison industry job he tends to keep it unless he can move to a better prison industry job. In 1975 the average income in these jobs was $63 a month.

7. 50% was used because roughly 45% of the total inmate population is incarcerated in the SPSM.

8. This treatment was suggested by Corazzini's property value weights of 75% for land and buildings and 25% for equipment for vocational education. See Arthur J.

Corazzini, "The Decision to Invest in Vocational Education: An Analysis of Costs and Benefits," (The Journal of Human Resources, Supplement, 1968), p. 101.

It should be noted that it may be argued that the building rent can be treated as zero if it is assumed that the space used for the vocational school would be used for some other purpose by the inmates, such as housing. However, the location of the vocational school would not be conducive to housing use except during a period of extreme overcrowding, so the rental cost is included in the cost of the vocational programs.

9. In 1974 58% of the criminal court dispositions in Michigan were probations. See Michigan, Department of Corrections, Annual Report 1974 (Lansing, MI: State of Michigan, 1976), p. 16. It has been estimated that the cost of probation is about 7% of the cost of keeping an adult offender in prison. See the President's Commission on Law Enforcement and Administration of Justice, The Challenge of Crime in a Free Society (Washington, D.C.: U.S.G.P.O., 1967), p. 32.

10. For example, see the discussion in John F. Holahan, A Benefit/Cost Analysis of Project Crossroads (Washington, D.C.: National Committee for Children and Youth, 1970), Ch. 2.

11. Larceny, theft, robbery, and burglary constituted 95% of the reported Index crimes in Michigan in 1975 and 50% of all reported offenses. David I. Verway, ed., Michigan Statistical Abstract v. 11 (E. Lansing, MI: Michigan State University, 1976), pp. 376-381.

12. The available data estimated the average cost of the entire criminal justice system and the marginal cost of policy work in 1965. The cost of incarceration was subtracted from the estimate and the remaining number was adjusted to 1973 with the C.P.I. See the President's Commission on Law Enforcement and Administration of Justice, op. cit., p. 265.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The outcomes of rehabilitative programs such as vocational training provided in prisons can be evaluated from two perspectives.[1] Our current approach in rehabilitation is based on the view that crime is a disease which can be treated with various programs to effect a cure. This implies that we know how to treat the disease successfully, but that we have not committed enough resources to the programs for them to succeed. An alternative view that is currently gaining popularity suggests that we do not know how to rehabilitate criminals who are, in fact, relatively normal members of society responding rationally to the facts and conditions of society. Consequently, even if we have the best possible rehabilitative programs, it is unlikely that they will overcome or even reduce the desire to pursue criminal activities.[2] The results of this study suggest that the latter perspective is premature with respect to vocational training, since the professional trainees in the sample, as well as the taxpayers who paid for the training and society as a whole, received measureable net benefits from the provision of vocational training.

7.2 Conclusions

There are eight major conclusions about the impact of prison vocational training on rates of recidivism and post-prison earnings.

1) The professional vocational training programs, consisting of computer programming, data processing, electronics, machine drafting, and vocational music, consistently demonstrated a favorable impact on the trainees. The professional programs accounting for approximately 61% of the trainees significantly reduced the probability of recidivism, while the programs accounting for approximately 54% of the trainees significantly increased the average annual post-prison earnings. The measured gains from training are probably underestimated, however, due to the high levels of unemployment which existed from 1970 through 1973 when most of the sample was released, and due to the exclusion of the illegitimate income gains which may have resulted from the training.

2) The largest reduction in recidivism among professional trainees was found among program completers who were enrolled in one program for seven or more months. A relatively long period of time spent studying and mastering the skills taught can create more stable and perhaps more satisfactory employment opportunities by moving the ex-offenders out of the secondary labor market.

3) The largest gain in average annual post-prison earnings accrued to the professional program completers who were enrolled six months or less. The reason for the inconsistency between this result and that of the recidivism model is unclear. It may reflect the specification of the empirical model, or the possibility that the training provided the ex-offender with marketable skills resulting in higher earnings without developing the trainee's commitment to pursue the occupation after his release from prison.

4) The reduction of recidivism among the professional trainees cannot be explained completely by gains in earnings. This suggests that the decision to "go straight" is not made solely on the size of legitimate wages as compared with illegitimate wages, but also takes into account a wide range of factors influencing job satisfaction and career potential.

5) The craftsmen, clerical, operatives, and service worker training programs consistently failed to demonstrate a favorable impact on the trainees which would reduce the probability of recidivism or increase the average annual post-prison earnings. These programs taught the vocational skills traditionally provided in prisons during relatively short training programs. As a consequence they were unable to upgrade trainee skills and opportunities to enable an ex-offender to move out of the secondary labor market.

6) Although trainees enrolled in programs other than the professional programs were not favorably influenced by the program per se, enrollment in the program as one way of earning credits toward a high school degree did result in higher post-prison earnings. This same gain was also experienced by men who received a high school equivalency certificate while in prison.

7) The significant personal characteristics predicted the patterns of recidivism as expected, as well as the patterns of the post-prison increases in earnings. The one exception was the unfavorable impact of marriage on post-prison earnings.

8) The benefit/cost ratios for the entire group could not be estimated. However, the ratios were calculated for the professional trainees as rough guides to the return to investment in human capital through successful vocational training. It is clear that the professional programs were wise investments for the individual trainee, the taxpayers, and society as a whole. The primary benefit to the taxpayer and society accrued due to the reduction in recidivism-related costs.

7.3 Recommendations

Two sets of recommendations are offered: improvements in the educational programs of the prisons, and improvements in the information available to the Michigan

Department of Corrections regarding the success of its education programs.

7.3.1 Recommendations for Education Programs

The taxpayer and society receive the greatest return to their investment in vocational training due to the reduction of recidivism. The probability of recidivism is most reduced by the completion of a relatively long training program. Two recommendations follow from this result. The Department of Corrections should actively encourage program completion. This may be accomplished by continuing its current efforts to change from traditional teaching methods to programmed learning techniques or by other innovative modifications in the delivery of training. In addition, the mixture of training programs offered should be reviewed. Three considerations should enter into the review process. Professional programs should be continued due to their favorable impact on the trainees as demonstrated in this study. Those traditional training programs which do not train inmates for institutional jobs, are too short to have much favorable impact on legal employment opportunities and wages, and/or are likely to train in skills in low demand, should be replaced with programs which are long enough to have the desired impact on legitimate opportunities and to train in skills in relatively high demand. Finally, many occupations are still closed to ex-offenders as indicated in Table 7.1, despite the repeated efforts of the Department

of Corrections to reduce the number of closed professions. These efforts to open more occupations to ex-offenders should be continued in order to expand the occupations which could be taught in vocational training programs.

The gain in income resulting from the completion of high school or high school equivalency suggests that for some inmates basic literacy achievements may be more important for the improvement of legitimate employment opportunities than specific occupational skills. A major objective of the prison schools should be, therefore, an expansion of the facilities necessary to ensure that inmates who failed to complete high school prior to incarceration can earn a high school equivalency certificate or high school diploma during their incarceration. The importance of completing this stage of education can continue to be stressed through the use of the parole contract tying the completion of high school with the parole release date. It should be noted that the continued provisions of various vocational programs which provide high school credit is an important method of achieving this goal, since some men may not want to study academic high school courses but will pursue a vocational track.

The vocational programs which failed to have a favorable impact on trainees were those which typically employ outdated equipment in the training process. The obsolete equipment makes the transition from prison

Table 7.1. Professions Legally Closed to Ex-Offenders in Michigan[1]

Accountant	*Healing Arts Practitioner
Architect	Insurance Agent/Broker
Attorney	Manicurist
Barber	Masseur
Barber Instructor	Midwife
Beauty Shop Owner	Motor Vehicle Operator
Billiard Operator	Practical Nurse
Broker- Insurance	Registered Nurse
Chiropodist	Psychiatric Nurse
Chiropractor	Optometrist
*Commission Merchant	Osteopath
Cosmetologist	Pharmacist
Dental Hygenist	Physician
Dentist	Plumber
Electrologist	Podiatrist
Embalmer	Private Investigator
Employment Agency Operator	Psychologist
Engineer	*Recreation Hall Operator
Forester	Sanitarian
Funeral Director	Veterinarian
*Gunsmith	Watchmaker
Hearing Aid Dispenser	

1. Those marked * are closed to ex-offenders only in Michigan; no other state restricts them. Some of these restrictions can be waived at the discretion of the licensing board.

equipment to more modern equipment in legitimate employment more difficult. Efforts should be made to modernize the equipment used in the training programs.

7.3.2 Recommendations for Improved Information

The empirical results of this study raised two issues which could not be resolved within this research design: which of the professional vocational programs are

responsible for the measured favorable impact on the trainees, and what is the relative importance of the program characteristics per se as compared with unobserved trainee characteristics, such as the motivation of a trainee, as explanatory factors in the measured impact? The Department of Corrections should address future vocational training research toward these two issues in order to expand the information needed for further improvements in the vocational rehabilitation programs.

7.4 Final Remarks

Many ex-offenders pursue a zigzag path between the legitimate and illegitimate labor market as their employment opportunities in these two types of economic activities change. The research in this study is limited by the necessary focus on the legitimate labor market experience of the trainees and controls in the sample. However, although we cannot measure the impact of vocational training on illegitimate activities, it is clear that professional trainees experience substantial improvements in their legitimate employment opportunities. Public expenditures on vocational training do succeed in rehabilitating some trainees.

FOOTNOTES

1. Robert Martinson, "What Works? Questions and Answers About Prison Reform," The Public Interest, no. 35 (Spring, 1974).

2. This perspective often recommends a reduced role for prison and the placement of offenders in such non-prison institutions as half-way houses.

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