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An Economic Analysis of School and Labor Market Outcomes For At-Risk Youth

Generosa Kagaruki-Kakoti

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AN ECONOMIC ANALYSIS OF SCHOOL AND LABOR MARKET OUTCOMES FOR AT-RISK YOUTH

By

GENEROSA KAGARUKI-KAKOTI

A Dissertation Submitted in Partial Fulfillment
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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics in the Andrew Young School of Policy Studies of Georgia State University.

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By

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Federal education policy has targeted children who are disadvantaged in order to improve their academic performance. The most recent federal education policy is the No Child Left Behind law signed by President Bush in 2001. Indicators often used to identify an at-risk youth range from economic, personal, family, and neighborhood characteristics.

A probit model is used in this study to estimate the probability that a student graduates from high school as a function of 8th grade variables. Students are classified as at-risk of dropping out of high school or non at-risk based on having one or more risk factor. The main measures of academic outcomes are high school completion and post-secondary academic achievements. The main measures of labor market outcomes are short-term and long-term earnings.

The results show that a student who comes from a low income family, has a sibling who dropped out, has parents with low education, is home alone after school for

three hours or more, or comes from a step family in the eighth grade is at-risk of dropping out of high school. At-risk students are less likely than non at-risk students to graduate from high school. They appear to be more sensitive to existing conditions that may impair/assist their academic progress while they are in high school. At-risk students are also less likely to select a bachelor's degree. When they are compared to comparable non at-risk students, a greater percentage of at-risk students select a bachelor's degree or post-graduate degrees than non at-risk students.

At-risk individuals face long-term disadvantage in the labor market, receiving lower wage offers than the non at-risk group. Comparing only those without post secondary education shows that the average earnings offered to at-risk individuals were lower than those offered to non at-risk individuals. At-risk college graduates also receive lower earnings than non at-risk college graduates. The wage differential is largely due to the disadvantage at-risk individuals face in the labor market.

CHAPTER I

INTRODUCTION

Improving academic outcomes has always been an important policy issue as evidenced by the various policy statements from time to time. In 1965 the Elementary and Secondary Education Act (ESEA) was enacted to provide educational and other assistance to disadvantaged students and to improve their academic performance. The most recent federal education policy is the No Child Left Behind act (NCLB) (U.S. Congress 2001) signed into law by President Bush. Different academic outcomes are listed for achievement in the law. One important and noticeable outcome is high school graduation.

A student has typically four years to graduate from high school. It is hoped that after this time the student would be adequately prepared to join the labor force if he/she so chooses or continue with post secondary education. A student who enters the labor force would typically join the ranks of the unskilled workers. Completion of high school, though, does not guarantee that the youth would immediately find satisfactory employment. Employment opportunities for high school leavers have decreased and more youth face possible unemployment.

Not all students who enter high school are able to graduate with good grades and within four years. Some may have to repeat a grade, others still may leave high school

and then return at a later date and continue with their education. Thus, one finds that there are youth who are at-risk of performing poorly in high school. Those students who decide to leave school before graduating and do not return are considered as dropouts. This may be referred to as academic failure. These students may also face problems in the labor force and in post secondary institutions. There are various socio-economic and demographic characteristics that may increase the probability of academic failure. Federal, state and local governments have made an effort to identify students with these characteristics at a younger age in order to assist them. These students are usually referred to as 'at-risk' students.

There are a number of indicators that may be used to identify an at-risk student. The different measures range from economic, personal, family, and neighborhood characteristics. Though most studies agree on the impact of some of the factors on a child's development, there is no consensus on which factors impact the child more and what group of factors is more important. Therefore, they serve as a starting point for this study in indicating potential factors that place a child at-risk for school failure. In this dissertation a student is determined to be at-risk from dropping out of high school based on factors existing prior to entry into high school. A risk indicator is formed to designate at-risk status which then allows for comparison of academic and labor market outcomes between at-risk and non at-risk students. This study adds to the literature by looking at the effect of at-risk designation and the effect of the different risk factors. The aim is to be comprehensive in addressing at-risk status by combining both educational attainment

and labor market outcomes.

This study, uses data from the National Education Longitudinal Study of 1988 (NELS) dataset. It contains information on a cohort of students who were in the eighth grade in spring of 1988. The students are analyzed, from entry in the ninth grade until they dropout or graduate, and after high school. The focus of this study is on a sample of students who were initially surveyed during the base year and who were surveyed during the follow-up surveys. Only those students who were interviewed during the base year and subsequent surveys are selected for this study, as the aim is to follow the student throughout the survey years. Further checks were done to ensure that basic demographic information was available, leaving the dataset with 9364 observations.

The primary focus of this study is to determine whether at-risk status negatively influences both academic and labor market outcomes. The following questions are addressed in this dissertation: (1) what are the factors that may be used to determine whether a student is at-risk of dropping out of high school?, (2) are at-risk students more likely to experience academic failure than those who are not at-risk?, (3) what are the factors that affect high school completion for both at-risk students and non at-risk students?, (4) what factors affect post secondary education choices of both at-risk and non at-risk students?, (5) do at-risk students fare differently from non at-risk students in the labor market after high school completion and whether any disadvantages exist after 6-8 years?

This study is different from previous studies that look at at-risk outcomes and dropouts. Though the focus is on factors that increase the likelihood of dropping out of high school, this study does not analyze the academic and labor market outcomes of at-risk youth who have dropped out of school. The main measures of academic outcomes that are explored in this dissertation are high school completion and post-secondary academic achievements of at-risk and non at-risk students. The main measures of their labor market outcomes are short-term and long-term earnings. What may be learned is whether at-risk students are more disadvantaged in academic and labor market outcomes compared to those not at-risk and whether any disadvantage persists 6-8 years after high school graduation. The answers to these questions will assist in policy formulation to address the problem of at-risk students.

This study separates a student's experiences into two distinct periods, the academic period and labor market period. The initial step is to identify those factors that place an individual at-risk for not completing high school. Therefore, dropout behavior is modeled as a function of the variables that have some influence on dropout behavior in order to ascertain which factors have the greatest influence on dropout behavior. A probit estimation is used to estimate the probability that a student graduates from high school as a function of 8^{th} grade variables. This is done in order to allow for the identification of those individuals who are at-risk for dropping out. Once the risk factors are identified, they are used to create an indicator function to determine the at-risk population and those not at-risk. These factors will thus form the basis of the at-risk characteristics with which

to identify at-risk students. Students are classified as at-risk or non at-risk based on having one or more of the at-risk factors.

The probit model is then re-estimated for the pooled sample group with the risk indicator A and then for both the identified at-risk group and those not at-risk as a function of high school variables. The aim here is to determine which factors are important determinants in the student's dropout decision while they are in high school. This will allow for early intervention, monitoring and policy implementation in high school.

The next academic period analyzes post-secondary education choices. For both groups of students, at-risk and not at-risk, conditional on graduating, the student undertakes post-secondary education (PSE) or not. Eight years after graduation (in 2000) students were interviewed about their post-secondary experiences. The post-secondary education (PSE) choices are; some PSE, Associate degree, Certificate license, Bachelor degree, Graduate degree, and no PSE. In this section an ordered probit model of post-secondary education choices is estimated. The aim is to analyze what factors increase the likelihood that an at-risk youth obtains post-secondary education and the level of education that s/he would pursue. Their post-secondary education outcomes are compared with those students who are not at-risk.

In the labor market analysis the aim is to see whether the disadvantages of at-risk status persist in the labor market. The focus is only on those students who have completed high school. This is done in order to isolate the impact of at-risk factors in the

labor market and not confound them with the lack of high school diploma. Students in the survey were interviewed initially after their expected graduation date (i.e. in 1994) and then again six to eight years after their expected graduation date (i.e. in 2000).

The short-term labor market outcomes are compared with long-term outcomes. The goal is to see whether the impact of at-risk factors is mitigated over time. Here the wage differential between at-risk and not at-risk high school graduates is estimated. A standard log-wage equation, corrected for sample selection, is estimated with log weekly wages specified as a function of socio-economic factors, demographic factors, and occupational factors in the short-term and long-term. Then, the differences in the earnings between the two groups are decomposed to separate the reasons for the differences, which may be due to differences in human capital characteristics, selection effect or unobservables.

The identification of at-risk students may assist the government in its efforts to target and assist disadvantaged students. Policy focus has been to ensure that students complete their high school education. Federal, state and local governments have made an effort to identify students with at-risk characteristics at a younger age in order to assist them. The current challenge for state and local governments is to meet the standards set by the federal government (Mitchell 2000).

The federal government has already spent millions of dollars in various programs to assist disadvantaged students. Since ESEA was enacted, Congress has continued to provide funding for educational programs including those aimed at assisting at-risk

youth. Improving America's Schools Act of 1994, authorized $40 million in appropriations in the 1995 fiscal year, for prevention and intervention programs. The NCLB act (U.S. Congress, House 2001) also provided for both prevention and intervention programs for at-risk youth as well as for school dropout prevention measures. $50 million was authorized for appropriation for the fiscal year 2002 in part for at-risk youth, while $125 million was authorized for appropriation for school dropout prevention and for 5 succeeding fiscal years. Understanding the ways in which at-risk youth and those not at-risk experience academic and labor market outcomes will help facilitate the achievements of at-risk youth. Existing programs assisting all youth may need to be re-evaluated to incorporate an emphasis on at-risk youth.

Different authors have looked at the various consequences of dropping out. McCaul et al. (1992) found that male and female graduates were more involved politically and were more likely to vote compared to dropouts. They also found that dropout males, consumed more alcohol, experienced more unemployment, had more jobs, while female dropouts earned less than female graduates and were less satisfied with their work. Thompson (1998) analyzed the economic costs of high school dropouts to the different states by estimating the income loss for each state arising from dropouts. He found a negative relationship between a state's per capita income and the percent of adult dropouts. States with relatively low per capita spending on education, experience larger income losses that arise from having school dropouts. Thus increasing the high school completion rate may lead to an increase in individual and state income levels.

Individual consequences of dropping out include lower academic skills, unemployment, low income, and lower competitiveness in the labor market. Social consequences include increased crime, foregone national income and tax revenues, and increased demand for social services. At-risk students may require an increase in remedial programs in order to succeed, raising costs to post secondary institutions and cost of attendance and opportunity cost of remaining longer in college. The increasing number of at-risk students implies a larger number of ill-equipped workers. This will impact employers and the country with lagging productivity, higher training costs, and a less competitive workforce (Levin 1989). Therefore if academic and labor market outcomes are worse for at-risk students then policy makers may want to re-evaluate existing programs assisting all youth.

The results of this dissertation show that a student who comes from a low income family, has a sibling who dropped out, has parents with low education, is home alone after school for 3 hours or more, or comes from a step family in the eighth grade is at-risk of dropping out of high school. Based on these five factors, an indicator variable was constructed which allowed for the identification of at-risk and non at-risk students. At-risk students are less likely than non at-risk students to graduate from high school. They appear to be more sensitive to existing conditions which may impair/assist their academic progress while they are in high school. At-risk students also appear to be limited in their PSE choices. When they are compared to comparable non at-risk students, a greater percentage of at-risk students select a bachelor or post-graduate degrees than non at-risk

students.

At-risk individuals appear to be at an advantage in the labor market in 1993, but by 1999 they were at a disadvantage. They were facing lower wage offers than individuals in the non at-risk group in 1999. In order to account for any unobservables in the labor market, only those individuals similar education level were compared in 1993 and 1999. Comparing only those without PSE, shows that at-risk individuals were less likely to enter the labor market in 1993. Their wage earnings were at least 60% less than those for non at-risk individuals in both years. At-risk college graduates were also at a disadvantage compared to non at-risk college graduates in 1999, but their earnings differential was much smaller.

Chapter two reviews related literature on factors affecting at-risk status and academic and labor market outcomes. Chapter three describes the data and empirical models used in the dissertation. Chapter four contains the empirical results and interpretation. Chapter five covers the conclusions and directions for future research.

CHAPTER II

REVIEW OF RELATED LITERATURE

There are a number of indicators that may be used to identify an at-risk student. The different measures range from personal, family, school, and neighborhood characteristics. Though most studies agree on the impact of some of the factors on a child's development, there is no consensus on which factors impact the child more and what group of factors is more important. Table A1 summarizes a number of different studies that look at children's outcomes, which include educational attainment. It forms the basis for the literature review where the studies are further discussed. These studies may be grouped according to the different characteristics affecting an individual. Some serve as a starting point in this analysis in identifying possible factors that may prevent an individual from graduating from high school. Other studies identify those factors that affect an individual's post secondary education choices and labor market outcomes.

Section A examines who is at-risk and what are the factors affecting at-risk status. These factors include individual, family, neighborhood, school and the labor market characteristics. Section B focuses on at-risk status and factors affecting post secondary educational attainment, while Section C focuses on the link between at-risk status and labor market outcomes. Section D is a summary of the existing literature.

A. Who is At-Risk and Factors Affecting At-Risk Status

Title I of the No Child Left Behind Act of 2001 (NCLB) (US Congress, House 2001) deals with improving the academic achievement of the disadvantaged. It expresses concern of the government that all children achieve a certain level of academic proficiency. It also states the government's commitment to achieving this goal.

> "(2) meeting the educational needs of low-achieving children in our Nation's highest-poverty schools, limited English proficient children, migratory children, children with disabilities, Indian children, neglected or delinquent children, and young children in need of reading assistance;
> (3) closing the achievement gap between high- and low-performing children, especially the achievement gaps between minority and nonminority students, and between disadvantaged children and their more advantaged peers;"
> (US Congress, House 2001, sec. 1001)

The act authorizes appropriations for prevention and intervention programs for youth who are neglected, delinquent or at risk, which include school dropout prevention programs.

Different studies define at-risk differently. The terms at-risk and disadvantaged are often used interchangeably and are thought to imply the same thing. They all imply that the target population is different from the rest in ways that require some intervention to bring it to par with the rest of the population.

NCLB mentions the disadvantaged child but does not define who this particular child is. It lists the factors that may prevent a child from reaching a certain level of academic proficiency. It further defines the term at-risk as follows;

> "(2) AT-RISK.— The term 'at-risk', when used with respect to a child, youth, or student, means a school aged individual who is at-risk of academic failure, has a drug or alcohol problem, is pregnant or is a parent, has come into contact with the juvenile justice system in the past, is at least 1 year behind the expected grade

> level for the age of the individual, has limited English proficiency, is a gang member, has dropped out of school in the past, or has a high absenteeism rate at school."
> (US Congress, House 2001, sec. 1432)

Why is this child at-risk? The child is at-risk from the environment s/he is in. This environment has economic, social, demographic and physical risks that place this child in danger for not reaching his/her full potential in society. Different researchers list different factors as contributing to this disadvantage or placing the child at-risk.

Educational disadvantages that may arise from the family, school and the community are defined by Pallas, Natriello and McDill (1989). These deficiencies may continue as the child grows. The five factors that are considered important in identifying the educationally disadvantaged are being from an ethnic/race minority group, poverty household, single parent family, mother's education, and English deficiency. The more risk factors an individual has the more likely will he/she experience academic failure. The projected number of children with the various risk factors is expected to continue to increase over the next decade. This will require additional resources to be spent tackling the problem of the educationally disadvantaged. It also implies that new strategies linking families, schools and the community are needed to handle the problem.

Another list of measures that affect a child's development was developed by Moore, Vandivere and Ehrle (2000). These measures were termed as socio-demographic risk factors and were used to construct an index that included single parenthood, large family size, poverty, and low parental education. A combination of these risks increases

the likelihood that a child will experience behavioral and emotional problems. The child is also more likely to have problems in school.

i. Individual Characteristics

Studies which look at individual characteristics tend to focus mainly on race. Jordan, Lara and McPartland, (1996) categorize the reasons students give for dropping out and they include family-related reasons, school-related reasons, work-related reasons, safety concerns, suspensions, mobility and peer influences. The factors that influence dropping out may be viewed as push factors from within the school or pull factors from outside. Policy makers may wish to reform school conditions in their efforts to reduce dropouts.

Differences in educational outcomes may be analyzed in terms of race and gender. Distinct disparities exist in the factors affecting schooling for different racial/ethnic groups. There are also differences between Blacks and Whites in terms of educational attainment and employment. Blacks are more likely to graduate from high school and continue on to college (Cameron and Heckman 1994, Rivkin 1995). Though there has been some improvement in dropout rates over time, especially for Blacks, high school dropout is still a problem, especially for Hispanics. They have higher dropout rates on average, than Black or White students. The 12^{th} grade, which has the highest level of dropout rates for all categories, is a crucial indicator of the time when a student is most likely to decide to drop out of school (Kominski 1990).

Suspensions increase the likelihood that a student will dropout in all Hispanic racial groups as did cutting classes except for Cubans students. Coming from a more well to do family and living with both parents reduced the likelihood of dropping out. Hispanic females from all groups were more likely to dropout compared to male students, as were all older students. Though there are some similarities in the reasons for dropping out differences do exist between the Hispanic groups that need to be documented (Velez 1989).

Individual behavior may be looked at as an indicator of high school completion. Ekstrom et al (1986) found that having behavioral problems and poor grades was a major determinant to dropping out of school, and that these factors were further affected by demographic and family variables. Family influences in the form of encouragement, mentoring, monitoring, parenting, and so on are important. The child that receives support from his or her parents and other family members is more likely to succeed in school and graduate. Ensminger and Slusarcick (1992) study showed that aggressive behavior in the lower grades, poor academic performance, and individual characteristics led to dropping out in high school. Both males and female students who did well during their first grade were more likely to graduate than those who did not perform well. A student's decision to complete school is influenced not only by the student's background characteristics but also by the student's achievement level and perceptions of the quality of school life. Lower ability/motivation is a specific trait of dropouts that affects their propensity to graduate (Eckstein and Wolpin 1999, Ainley, Foreman and Sheret 1992).

ii. Family Characteristics

Family structure is one of the important family characteristics that affect a child's educational attainment. Other family characteristics include parental education, family size and family environment. Studies analyzing family structure tend to compare various family structures with a traditional family. These structures may be a step-family, single parent family, or other family structure.

Parental education is an important determinant of whether a student graduates from high school. The higher a parent's education the less likely it is that a student will dropout of school. The level of mother's education is important in determining whether a child will graduate from high school (Garasky 1995, Hill 1979, Duncan 1994). Altonji and Dunn (1996) have mixed results as to whether parental education augments the returns to education. Parental characteristics though may have considerable impact on the wage level. Parent educational level and involvement in school activities, especially in the higher grades, increases the likelihood of a student graduating (Ensminger and Slusarcick 1992). Welfare policies affecting parents' earnings and family income impact children differently depending on the child's age. The positive impact on children's achievements is due to liberal financial incentives. A student with younger siblings is likely to dropout of school to care for them when the parent starts working (Clark-Kauffman, Duncan and Morris 2003, Gennetian et al. 2004).

Changes in parental marital status may lead to familial instability and ultimately affect children's educational attainment. Living with both original parents increases the likelihood of graduation compared to a parent and stepparent or a single parent. Growing

up with a stepparent has the same adverse results as that of a single parent family. Adolescents who experience changes in family structure are less likely to graduate from high school (Astone and McLanahan 1991, Sandefur, McLanahan and Wojtkiewicz 1992). Living in a single parent family during early childhood increases the probability that the individual does not attain A level certification (Ermisch and Francesconi 2001). Boggess (1998) also finds that living in a nontraditional family increases the likelihood of not completing high school. He finds gender and race differences in high school completion due to family structure and economic status.

The timing of the changes in family structure is also has differential effect on a child's development. The effect on schooling of the type of family structure differs with age and to whether the biological mother or father resided with the child. A changing family structure also affects a child differently depending on the childhood period during which the structure changes (Garasky 1995). Family disruption during early childhood has more effect on early adult outcomes than if the disruption occurred during late years (Ermisch and Francesconi 2001). A parent's absence leads to negative consequences for educational attainment. Having at least one parent absent are increases the likelihood that an individual dropouts out of school (Cameron and Heckman 1994, McLanahan 1997).

Parenting styles are more permissive in dropout student families. This increases the likelihood of dropout students making their own decisions regarding schooling. Negative sanctions and emotional reactions to student grades were more likely from parents in dropout families rather than positive reinforcement. Parents in dropout families are reported to be less involved in their children's schooling (Rumberger et al.

1990). Policy measures to solve the dropout problem may need to focus on providing social support, academic encouragement and academic assistance. There is also a need to supplement parental influences and strengthen parental involvement for students who are at risk for dropping out.

In another study Rumberger (1983) examines the differences in dropout individuals based on sex, race, and family background. He finds that women are more likely to dropout of school due to pregnancy or marriage. Men were more likely to dropout of school in search of employment. The lower the social class a student came from the more likely that the student would dropout of school. This is in part due to family characteristics like the parents' education, the amount of time spent with parents, and income. Differences that arise in racial dropout rates are largely accounted for by family background influences.

Student mobility as evidenced by changing schools and/or residence has a negative impact on high school graduation. There is evidence of a high prevalence of student mobility, especially among low SES students. Student mobility is both an indicator of school detachment and an important risk factor in determining non-completion of high school (Rumberger and Larson 1998). Non intact families and step families are more likely to have a high incidence of residential mobility and this in turn may increase the probability of dropping out of high school (Astone and McLanahan 1994).

iii. Neighborhood Characteristics

The neighborhoods of residence and peer influences are also cited as factors determining educational attainment. Brooks-Gunn, Duncan et al. (1993) hypothesize that neighborhoods will have more effects on developmental outcomes during adolescence. The effect is stronger during adolescence than when an individual is younger. Affluent neighborhoods have a positive effect on developmental outcomes of both children and adolescents. While low-income neighbors do not negatively influence youth, affluent neighbors exert positive influence. Male students from advantaged neighborhoods and low level of unemployed males are more likely to graduate from high school. There are differences in neighborhood influence on black adolescents compared to white adolescents. Black males are more affected by the level of unemployed males in their neighborhood (Connell and Halpern-Felsher 1997, Duncan 1994, Halpern-Felsher et al. 1997). Black males appear to gain from racial integration. Low-income neighbors influenced college attendance of black males, while affluent neighbors influenced white males. Though there are strong neighborhood factors that influence the outcomes of disadvantaged youth, family factors are also significant (Case and Katz 1991).

Comparison between blacks and whites by Datcher (1982) showed that black men were from a more disadvantaged background. She finds that neighborhood factors are as significant as family factors in determining the differences in black and white outcomes. 40% of the racial difference is due to the poorer black neighborhoods.

Differences exist in how neighborhood conditions affect the outcomes for Black and White youth. For Blacks, the neighborhood conditions affect the probability that they

will drop out of high school but not whether they will graduate from college. They are more likely to dropout of high school in a low-quality neighborhood then in a relatively high-quality neighborhood. White students are more likely to graduate from college in a high-quality neighborhood, but there is no effect on their high school attainment Neighborhood conditions affect a disadvantaged black youth more than on an advantaged one. For the white youth, the effects are more important for those from affluent neighborhoods (Vartanian and Gleason 1999).

Reducing economic inequalities across neighborhoods may assist in increasing high school completion. Poverty during adolescence negatively affects high school completion and college attendance (Teachman et al. 1997, Vartanian and Gleason 1999). Other studies though find that neighborhood factors are limited in explaining differences in educational outcomes (Solon, Page and Duncan 2000).

iv. School Characteristics and Teenage Employment

Students are often encouraged to work while in high school in order to gain experience. The link between employment opportunities and the dropout rate has also been studied. Students who work while in school are more likely to earn higher wages and have better job prospects than those who do not. Working while in high school though may also affect academic performance. Both the job type and intensity affect dropping out. The effect of work intensity and time spent working on the decision to leave school before graduation has been analyzed. Given similar background characteristics, Blacks are less likely to dropout of school when compared with Whites,

while older Hispanics are more likely to graduate. Increasing work hours increases the likelihood of dropping out (Eckstein and Wolpin 1999, Tienda and Ahituv 1996, McNeal 1997, Ruhm 1997).

The presence of jobs in the community may entice students away from school and into the labor force. Flaherty's (1991) results show that the unemployment rate for 16 to 19 year olds is positively related to the local dropout rate. He also finds that dropout rates rise with the expansion of blue-collar employment opportunities implying that the labor market tends to attract potential dropouts from secondary schools. He thus concludes that while employment opportunities may attract dropouts, the existence of teenage specific unemployment would encourage them to complete their education.

The lack of employment opportunities discourages students from dropping out of school in search of a job. When unskilled labor market opportunities improve, dropping-out increases and GED acquisition decreases. Racial differences exist in the response to changes in the unemployment rate. Black students are more likely to leave school in response to a worsening economic situation. Blacks who enter the labor market however do not fare well compared to their White counterparts. This outcome is partly explained by the fewer employment opportunities available to Blacks. Employment opportunities and family background affect the student's decision to remain in school. There is support for current policies that try to provide support services to enable a student mother to remain in school. (Cameron and Heckman 1994, Kain 1992, Rivkin 1995, Olsen and Farkas 1989, Rees and Mocan (1997)

School factors may also be important in determining educational attainment. School environment and policies are important in keeping students in school. Disciplinary problems and lack of support may contribute to the dropout problem (Wehlage and Rutter 1986). Though the primary pupil-teacher ratio has no effect on educational attainment or on earnings at age 33, the secondary level pupil-teacher ratio has some impact on women's earnings at age 33. The type of school is an important determinant of educational attainment and earnings of men at age 33 (Dearden, Ferri and Meghir 2002). Increasing expenditures on schools positively affects educational attainment and future incomes of an individual (Wilson 2001).

Schools may affect labor market outcomes for those high school graduates who enter the labor market directly after leaving school. Asians have higher earnings than either whites or blacks. Schools make a difference in the labor market outcomes of graduates who enter the market directly (Crawford, Johnson and Summers 1997). Students from Catholic schools are more likely to graduate from high school and go to college than those from public schools. Catholic schools greatly influence the outcomes for urban students (Evans and Schwab 1995).

Policies designed to keep students in school may actually be putting the focus on dropping out. Compulsory laws, for instance, are put in place with the aim of keeping students in school until they reach a particular age. They may act as signals or milestones for students to cross thus encouraging students to dropout of school at that particular age. Students born in certain months are compelled to remain longer in school as a result of school age entry requirements and compulsory schooling laws. Compared to students

born later in the year, students born earlier in the year tend to have a lower average educational level. Angrist and Krueger (1991) find that compulsory schooling laws lead to an increase in educational attainment by those required to remain in school and ultimately higher earnings. The efficacy of the compulsory schooling laws is due in part to child labor laws that limit youth employment. It is also due to enforcement and policing efforts on the part of the schools and school administration (Angrist and Krueger 1991).

B. At-Risk Status and Factors Affecting Post Secondary Educational Attainment

The likelihood of disadvantaged youth entering college is less compared to those more advantaged. The negative effect of pessimistic parental assessment is lessened if the child attends a school in an advantaged neighborhood. The linkage is thus partly explained by attitudes and parental behaviors (Crosnoe, Mistry, and Elder 2002).

Van Ophem and Jonker (1997) study the duration of higher education. Their results show that African-Americans and Hispanics require more time to graduate and are more likely to quit college than Whites. Younger students require less time to complete their studies and are less likely to quit compared to older persons. The more educated a father is, the more likely a student graduates, perhaps indicating more financial support for the student. Having a scholarship reduces the time to graduation and increases the time until the student quits.

The main factors affecting college destinations are test scores, high-school grades, academic track, extra curricular activities and educational aspirations. Socioeconomic

factors tend to affect students' decisions. Differences in college enrollments of students with similar ability, expectations and accomplishments persist due to differences in socio-economic status especially income levels. Financial incentives increase the likelihood of enrolling in college, especially grants and scholarships. Blacks respond to higher rates of return to college education and increase their enrollments unlike Whites. Blacks are more responsive to local market conditions and to financial. Ability, income and parental education are significant predictors of college attendance (Averett, McLennan, and Young 2000, Hearn 1991, Catsiapis 1987).

High school dropouts may decide to complete high school by some type of educational credentials. One method is by obtaining their General Education Development certificate (GED). This certificate may be used to obtain further post-secondary education and training. Those factors that determine high school graduation differ from those that determine taking the GED examination. Parental education is an important determinant for school attendance and completion but only the father's education is important for the GED decision. Dropouts, who leave school with weak cognitive skills and later obtain a GED, have higher earnings than those who did not obtain GED certification. They are able to raise their earnings to levels similar to dropouts and GED recipients who left with higher skills. GED recipients are able to undertake post-secondary education and benefit from it (Cameron and Heckman 1994, Murnane, Willet and Tyler 2000).

High school diploma recipients complete PSE and training programs at a higher rate than those with a GED. While a GED may be used to obtain PSE, GED holders are

not as successful in completing their programs as compared to high school graduates. Black and Hispanic high school graduates are more likely to go to college even though they are less likely to graduate. The impact of family income is mainly through ability formation and preparing children for college. Policy makers may wish to focus on high school completion in order to provide students with the necessary skills and motivation for college success. (Cameron and Heckman 1994, 2001) In another study Murnane, Willet and Boudett (1997) found that obtaining a GED increased the likelihood that the dropout attended college, especially for females. Having a GED also increased the probability of participating in training and military service.

It is seen from the above studies, that high school dropouts benefit from obtaining a GED. The GED serves as a signal to employers of the potentials that the dropout had since the individual did not graduate from high school. It also allows the individual to benefit from PSE and training opportunities.

C. The Link Between At-Risk Status and Labor Market Outcomes

Education is a significant human capital investment. Youth make rational educational decisions based on economic incentives. The earnings of educated persons in the United States have risen over the past few decades. Having an increased level of education raises a person's income level.[1] Human Capital theory assumes that education increases a person's earnings and productivity. Other characteristics influence educational choice by altering the individual's utility from schooling. Therefore it is to

[1] Ashenfelter and Krueger (1994) show that each additional year of schooling augments earnings by 12-16 percent

an individual's benefit to remain in school and complete his/her education (Becker 1993, Card 1995, Wilson 2001). Endogenous schooling accounts for differences in ability and tastes between individuals. Differences in discount rates across individuals may account for the variation in educational attainment. Therefore the implication is that students with higher marginal returns to education will have low levels of education (Card 1995).

Public policy aims at reducing the dropout rate in order to increase labor market success of an individual and reduce the social and economic costs of dropping out. A comparison of the labor market experience of teenagers who have completed high school with those who have not suggests that employers are not using the diploma to discriminate on the basis of observable characteristics, like gender, rather they may be doing so based on unobserved characteristics. In situations of ample labor supply of high school graduates, it may be more profitable in terms of the hiring process, for employers to screen out those without diplomas. The high school diploma may be signaling additional productivity or ability traits to the prospective employer. Therefore, it is to the advantage of a student to complete high school as this improves employment opportunities and earnings. Additional years of schooling would not only increase the effective labor supply but also may allow the student to acquire productive characteristics through completion of high school.

The benefits of additional schooling cannot be overemphasized. Over time both the wage rate and work hours have increased with the level of schooling. The effect of additional schooling is to reduce the incidence of unemployment spells. Work experience reduces the length of unemployment spells among the unemployed.

Investment in education relaxes the constraints on choice faced in the labor market (Ashenfelter & Ham 1979). Despite the increased benefits of additional schooling, dropouts may have some advantage in the labor market. They demonstrate higher skills in jobs that do not require a high school diploma. Thus they appear to have comparative advantage in jobs that are done by non-graduates (Eckstein and Wolpin 1999).

Some researchers have advanced other theories that include the signaling model, spatial mismatch model, and the theory of discrimination explain how this individual fares in the labor market. All have shown to some degree that an individual may be at a disadvantage in the labor market, and in turn face increased unemployment and lower earnings. The signaling model shows that the signaling part differs with the kind of education. Jaeger and Page (1996) estimate diploma effects on the returns to education and find that there are diploma effects for all PSE, signifying considerable credentialing effect. Employers may make inferences regarding potential employee pre-college educational abilities by studying their educational credentials. Thus the credentials act as an ability signal to employers. They signal human capital characteristics (Arkes 1999). Analyzing the racial differences in education and earnings, Polutnik (1994) finds the quality of the diploma matters. Overtime the amount of schooling between races has become similar but school performance, earnings and employment has continued to differ. There is evidence of sheepskin effects to the returns to education (Hungerford and Solon 1987).

The question in this study is whether the high school diploma is acting as a signal to potential employers. This is important for all students as employers may be assessing

their educational credentials. This study will show whether the human capital theory or signaling theory is more important and at what stage.

D. Contribution to Existing Literature

What the above-mentioned studies show is that there are many factors that affect high school completion. Some factors may have more impact than others, while others still may be correlated. The factors that may influence academic failure include individual, family, neighborhood, school, and the labor market activity. Other authors have typically focused on one of the above risk factors as being the primary dependent variable of interest linked to some aspect of school and labor market outcomes.

What these studies indicate is that a part of the population may not achieve a certain level of academic proficiency. Therefore, the previous studies serve as a starting point for this study in indicating potential factors that place a child at-risk for school failure. This study adds to the literature by looking at the effect of at-risk designation and whether it increases the risk for academic failure and poor labor market outcomes.

This dissertation adds to the literature by showing whether at-risk status is a persistent process or whether the conditions are mitigated over time in the labor market. The labor market outcomes only of high school graduates over two time periods are compared to see whether the impact of at-risk status is mitigated over time. Pervious studies have only looked at labor market outcomes at a particular point in time but have not compared labor market outcomes in this manner. Others have focused on dropouts or those with GEDs and compared their outcomes with high school graduates. In this study

the focus is only on high school graduates so as differentiate the effects of dropping out, from those of at-risk in both the PSE selection and labor market outcomes.

Comparison of labor market coefficients over time ascertains whether there are any changes in the coefficients between at-risk and non at-risk students. If there is any disadvantage faced by the at-risk group this may be evident after the comparison of the coefficients. This will allow for programs geared towards eliminating the disadvantage. As a further measure, wage decompositions of the wage differentials allows for the determination as to whether the wage difference is more attributable to the characteristics of the at-risk group or to the valuation of those characteristics in the labor market. This will aid policy makers in identifying ways to assist at-risk individuals in the labor market by identifying those human capital traits that put them at a disadvantage in the labor market.

CHAPTER III

DATA AND MODEL DESCRIPTION

The data and models that are used in this study are described in this chapter. Section A covers the data description. The data is from the National Education Longitudinal Study of 1988 (NELS). A theoretical framework for analyzing schooling behavior and labor market outcomes is then developed in section B. This is mainly based on the human capital model. Section C describes the models used in the estimation of academic and labor market outcomes.

A. Data Description

This study uses data from the National Education Longitudinal Study of 1988 (NELS) dataset. It contains information on a cohort of students who were in the eighth grade in spring of 1988. The students were surveyed for four years, from entry in the ninth grade until they dropped out or graduated, and after high school. The students were interviewed initially in 1988 and then follow-ups were done in 1990, 1992, 1994, and 2000. The focus of this study is on a sample of students who were initially surveyed during the base year and who were surveyed during the follow-up surveys.

During the base year (1988) survey, a nationally representative sample was drawn of eighth grade students. Students answered a questionnaire providing background and other information. They also took tests in reading, math, science and social studies. The surveys were carried out during the spring term, in 1988. One parent (per student), teachers and principals were also surveyed during the base year. Thus family, teacher and school characteristics were obtained.

Subsequent follow-ups were done to track down the students' progress in and out of school. The first follow-up survey was carried out in spring of 1990, sampling students in the 10th grade during the 1989-1990 school year and those who had dropped out. The students answered a wide range of questions concerning their home and school and took a cognitive test.

The second follow-up survey was undertaken when the majority of the students were in the 12th grade during the 1991-1992 school year. In addition to filling out the questionnaire, the students were further tested to determine academic achievement and growth since 1988. Dropouts completed a questionnaire answering a wide range of questions from reasons for dropping out, to school experiences and employment.

The third follow-up survey followed the students' post-secondary educational experiences and employment experiences. This was done during the spring of the 1993 - 1994 school year, two years after the expected graduation date for the cohort. The fourth follow-up survey was during 2000 when the average age of the cohort was 26 years old. Many changes had taken place since the students' graduation. These included career and employment changes, PSE endeavors, family commitments, and residence changes.

Only those students who were interviewed during the base year and subsequent surveys are selected for this study, so as to follow the student throughout the survey years. Further checks were done to ensure that basic demographic information was available leaving the dataset with 9364 observations.

Table B1 describes the variables used in this study. The variables are categorized by risk status, demographic information, schooling, PSE outcomes, labor market information, and neighborhood variables. Table B2 shows the descriptive statistics of all students, regardless of at-risk status. The sample has 72% White, 12% Hispanic, about 9% African-American and 7% other races. There is an over-sampling of Hispanics in this dataset. Women make up 53% of the sample.

The average family size did not change much between 1988 and 1992, averaging four persons per household. During the base year, the traditional two-parent family made up about 71% of the sample, followed by mother only family (about 13%) and step family 11%. The traditional two-parent family declined in 1990 to about 62%, declining further to 57% in 1992. Other family structure grew from four percent in 1988, to about 14% in 1990, increasing further still to about 17% of the sample in 1992.

In 1988 the majority of the sample had parents who were working, 88% of the mothers and 88% of the fathers. Most of the mothers were employed in the technical, sales and administration occupations (16%), while 27% were in managerial and professional occupations and 20% were in service occupations. Most of the fathers (27%) were in operators, fabricators, and laborers occupations, 23% were in technical, sales and administration, and 14% in precision, craft and repair occupations.

About 35% of the students came from the Southern States in 1988, while 29% come from the North Central region. The distribution of students by state did not change much by the time the individuals were in 12th grade. 43% attended a suburban school, 33% a rural school and 24% an urban school in 1988 compared to 40%, 32%, 26%, respectively in 1992.

By 2000, the majority in the sample (89%) had completed high school and obtained a high school diploma. Only 18% of the sample did not pursue any PSE opportunity, while 31% obtained a Bachelor's degree, 14% had either an Associate degree or a certificate, and about 29% had some PSE. A few, four percent, went on to get a post-graduate degree.

A secondary source of data used was the Census Bureau summary data files. 1990 Census data was used to provide neighborhood variables for the students when in the 10th grade. The 2000 Census data was used to provide labor market variables and neighborhood variables for the labor market regressions.

B. Empirical Models

This study separates a student's experiences into two distinct periods, the academic period and labor market period. The first step is to identify those factors that place an individual at-risk for not completing high school. Once the dominant factors are identified, students are classified as at-risk or non at-risk based on having one or more of the at-risk factors. While a combination of risks may leave a person more inclined to dropout of school, having even just one factor puts the individual at risk for dropping out.

Therefore, the aim is not to look at the level of risk but rather identify those individuals who may be at any risk of dropping out of school. The premise here is that just being at risk for dropping out puts a student at a disadvantage compared to those not at risk for dropping out, thus having at least one of these risk factors may be sufficient to form a risk indicator variable.

A student's initial decision is to graduate or drop out of school. For both groups of students, at-risk and not at-risk, conditional on graduating, the student undertakes post-secondary education (PSE) or not (see Figure 1). Conditional on dropping out the student obtains a GED or not. The student may then decide to pursue PSE or not. The focus here is to model graduation behavior and PSE selection. The decision process of dropouts' selection of GED and PSE choice is not modeled here.

In the labor market, the focus is only on those students who completed high school. This is done in order to isolate the impact of at-risk factors in the labor market and not confound them with the lack of high school diploma. Other studies have already focused on dropouts and those with GEDs and have shown that those students without a high school diploma are at a disadvantage in the labor market (Stern et al. 1989, Murnane, Willet and Tyler, 2000). Therefore this segment of the population is not included in this analysis as the focus is to discern whether the disadvantages of at-risk status persist in the labor market over time. One model is specified to explore labor market outcomes at two time periods based on earnings. Comparison is made between at-risk and non at-risk students to see whether earning differentials exist.

i. Academic Outcomes

High School Completion

The first stage of the analysis is to identify those factors that place an individual at-risk for academic failure. Academic failure in this study is defined as dropping out of high school without obtaining a diploma. Previous studies have shown that certain factors increase the probability that a student drops out of high school, while other factors lower the chances of dropping out of school. One cannot state a priori whether the effects of the factors would be similar or different for both at-risk and not at-risk groups. For example, a mother's education level may have the same impact on graduation probability across at-risk status, but current labor market conditions may have a differential impact across at-risk status.

As seen from the literature review, there is currently no consensus as to what factors have a greater influence on a student's decision to drop out of high school. Prior research has focused on the direct effect of certain factors on academic and labor market outcomes. In this study dropout behavior is initially modeled as a function of the pre-high school variables that have some influence on dropout behavior in order to ascertain which factors have the greatest influence on dropout behavior. These factors will then form the basis of the at-risk characteristics with which to identify at-risk students. This allows for the comparison of academic outcomes of at-risk individuals and those not at-risk as well as labor market outcomes.

An individual is considered to have dropped out of high school if s/he left school, and did not return, without attaining a high school diploma. Some students may take

longer than four years to graduate from high school. High school completion in this study is defined as obtaining a high school diploma. This study recognizes the fact that obtaining a GED may be considered as completing high school. Since this is usually done after a student has dropped out of school, these individuals will be regarded as dropouts in the initial estimations, in order to separate those who complete school by obtaining a diploma and those who do not.

The initial model includes all students whether at-risk or not. A probit estimation is used to estimate the probability that a student graduates from high school as a function of 8th grade variables. The aim here is to determine which factors are important determinants in the student's dropout decision. Eighth grade variables are used in order to determine pre-existing conditions. Subsequent estimations will be a function of factors existing while the student is in high school.

The high school completion model is specified as follows;

$$y_i = \alpha_{0i} + \alpha_{1i}' X \quad + \varepsilon_i \tag{1}$$

y_i is the probability of completing high school

$Y_i = 1$ if the individual completes high school implying $y_i > 0$

$Y_i = 0$ if the individual drops out, implying $y_i \leq 0$

Where, X is the vector of individual and socio-economic characteristics measured in the 8th grade expected to influence the graduation probability.

$$\text{Prob } (Y_i = 1) = P(\varepsilon_i > -(\alpha_{0i} + \alpha_{1i}' X_i)) \tag{2}$$

$$= F(-\alpha_{0i} - \alpha_{1i}' X_i) \tag{3}$$

is the probability that an individual completes high school. Implying that the probability of non-completion will be,

$$\text{Prob } (Y_i = 0) = P(\varepsilon_i \leq -(\alpha_{0i} + \alpha_{1i}' X_i)) \tag{4}$$

$$= 1 - F(-\alpha_{0i} - \alpha_{1i}' X_i) \tag{5}$$

The log likelihood function becomes;

$$\log L_i = \sum_{i=1}^{n} \left\{ y_i \log F(-\alpha_{0i} - \alpha_{1i}' X_i) + (1 - y_i) \log[1 - F(-\alpha_{0i} - \alpha_{1i}' X_i)] \right\} \tag{6}$$

Assuming the error terms are uncorrelated results in the normal distribution with zero mean and unit variance, i.e., $F \sim N(0,1)$.

Once the risk factors are identified, they are used to create an indicator function *A* to determine the at-risk population and those not at-risk. The most important factors are used in the analyses that follow to designate at-risk status. These are selected based on the higher level of significance and the size of impact on the graduation outcome. A student is considered to be at-risk if s/he has at least one of the risk factors. The probit model (equation 6) is then re-estimated with the risk indicator A, and then for the identified at-risk group and those not at-risk, as a function of high school variables. This is done to show whether at-risk status is a factor during high school. It will also allow for comparisons between the at-risk group and non at-risk group. Therefore the log likelihood function for the second stage estimation becomes,

$$\log L_i = \sum_{i=1}^{n} \left\{ y_i \log F(-\alpha_{0i} - \alpha_{1i}' X_i - \alpha_{2i}' A_i) + (1 - y_i) \log[1 - F(-\alpha_{0i} - \alpha_{1i}' X_i - \alpha_{2i}' A_i)] \right\} \tag{7}$$

Post-Secondary Education Attainment

Eight years after graduation (2000) students were interviewed about their post-secondary experiences. In this section a model of how at-risk youth classification affects post-secondary education choices is estimated. The aim is to analyze what factors increase the likelihood that an at-risk youth obtains post-secondary education and the level of education that s/he would pursue. Their post-secondary education outcomes are compared with those students who are not at-risk. This section includes only students who have obtained a high school diploma. Those with GED qualifications will not be included here. Previous studies (Cameron and Heckman, 1994, Cameron and Heckman, 1993, Murnane, Willet and Tyler 2000) have shown that those with GED's are not similar to those individuals without and therefore it would be erroneous to combine them here. Separate estimations will be done for both at-risk and not at-risk students and the coefficients compared.

Youth have five different post-secondary education choices; no-PSE, Some PSE, Certificate or Associate degree, Bachelor's degree, and Post Graduate degree. Here the assumption is made of discrete outcomes. While it is possible that a student selects lower levels of PSE before continuing on to a higher level, this level of progression is not observed. The order of choice for each individual is not known, only the final outcome. Therefore, in line with Greene (2001) and Maddala (1983), an ordered probit model is estimated to compare the PSE choices made.

Let Prob ($PSE_i = j$) be the probability that a person pursues PSE. Then the model is,

$$PSE_i = j^* = \beta_1' X_i + \beta_2' A_i + u_i \quad (8)$$

$d_i = 0 \quad \text{if } d_i^* \le 0 \quad (9)$

$d_i = 1 \quad \text{if } 0 < d_i^* \le \mu_1 \quad (10)$

$d_i = 2 \quad \text{if } \mu_1 < d_i^* \le \mu_2 \quad (11)$

$d_i = 3 \quad \text{if } \mu_2 < d_i^* \le \mu_3 \quad (12)$

$d_i = 4 \quad \text{if } \mu_3 < d_i^* \quad (13)$

d_i represents the PSE outcomes for individuals

j=0, . . , J are the different PSE levels (including no PSE)

i=1, . . , n are the individuals

Xs are the socio-economic factors affecting the outcomes

A is the at-risk indicator variable, where at-risk = 1

μ s are the unknown parameters to be estimated.

Thus the probabilities are;

$$\text{Prob } (d = 0) = \Phi(-\beta_1' X - \beta_2' A) \quad (14)$$

$$\text{Prob } (d = 1) = \Phi(\mu_1 - \beta_1' X - \beta_2' A) - \Phi(-\beta_1' X - \beta_2' A) \quad (15)$$

$$\text{Prob } (d = 2) = \Phi(\mu_2 - \beta_1' X - \beta_2' A) - \Phi(\mu_1 - \beta_1' X - \beta_2' A) \quad (16)$$

$$\text{Prob } (d = 3) = \Phi(\mu_3 - \beta_1' X - \beta_2' A) - \Phi(\mu_2 - \beta_1' X - \beta_2' A) \quad (17)$$

$$\text{Prob } (d = 4) = 1 - \Phi(\mu_3 - \beta_1' X - \beta_2' A) \quad (18)$$

where Φ is the standard normal cumulative function

and $0 < \mu_1 < \mu_2 < \mu_3 < \mu_4$

The log-likelihood function then becomes;

$$L^* = \sum\sum D_{ij} \log[\Phi(\mu_j - \beta_1' X_i - \beta_2' A_i) - \Phi(\mu_{j-1} - \beta_1' X_i - \beta_2' A_i)] \qquad (19)$$

ii. Labor Market Outcomes

In this section the earnings of at-risk youth who have completed high school are explored and compared with the earnings of non at-risk youth who have completed high school. Previous studies have already shown that individuals without a high school diploma are at a disadvantage compared to graduates (e.g. Polutnik 1994, Cameron and Heckman 1994). Thus this analysis is limited to high school graduates in order to focus on the impact of at-risk status for graduates rather than the impact of dropping out.

Students in the survey were interviewed initially after their expected graduation date (i.e. in 1994) and then again eight years after their expected graduation date (i.e. 2000). This allows for the comparison of short-term labor market outcomes with long-term outcomes. The goal is to see whether the impact of at-risk factors is mitigated over time. Here the wage differential between at-risk and not at-risk high school graduates is estimated. A standard log-wage equation is estimated with log weekly wages specified as a function of the at-risk indicator variable, socio-economic factors, demographic factors, and occupational factors in the short-term and long-term. The following relationship is estimated both for 1993 and six years later in 1999, for person i.

$$LnW_{it} = \delta_{0t} + \delta_{1t} X_{it} + \delta_{2t} A_i + \upsilon_{it} \qquad (20)$$

Where, W_{it} = weekly wages for individual i at time t

X_{it} = the socio-economic, demographic factors and other employment factors at time t

A_i = Risk indicator, where at-risk = 1

i = 0, 1, . . , n are the individuals

t = 1993, 1999

Wages are only observed for those individuals who are employed. Self-selection is controlled for in order for the results to be applicable to all high school graduates, whether employed or not employed. To account for this potential selection bias a two-step model is estimated following Heckman's (1979) procedure. The first step is to estimate a probit equation for the probability of employment. The probability of being observed with earnings in time period t is described by

$$I_{it}^{*} = \gamma_{0it} + \gamma_{1t} Z_{it} + \gamma_{2t} X_{it} + \gamma_{3t} A_i + u_{it} \qquad (21)$$

Where, I_{it}^{*} = 1 if person i is employed $(I_{it}^{*} > 0)$, and 0 otherwise

Z_{it} = factors affecting employment but not wages, this includes having children and being female with a child under six

X_{it} = are the socio-economic and demographic factors

A_i = Risk indicator, where at-risk = 1

The parameter estimates γ obtained from the probit are used to construct the inverse Mills ratio, which is then included in the wage equation.

The wage equation becomes,

$$LnW_{it} = \delta_{0t} + \delta_{1t} X_{it} + \delta_{2t} A_i + \delta_{3t} \hat{\lambda}_{it} + \upsilon_{it} \qquad (22)$$

Where, $\hat{\lambda}_{it} = \frac{\varphi(Z_{it}\hat{\gamma})}{\Theta(Z_{it}\hat{\gamma})}$, and the other variables as previously defined. The wage equation is estimated using OLS. The coefficients in the wage equations will be compared across time, especially the at-risk indicator coefficient. The wage equation is then estimated for the two risk groups (without the at-risk variable).

The above analysis will show the differences in labor market outcomes for those considered at-risk and those not at-risk. Comparing the coefficients of the wage equations over time, will show whether there are any significant differences in the size of the various determinants. It is not known, however, the role the differences between coefficients have in explaining any wage gap that may exist between the two groups. By decomposing the wage differential between at-risk and not at-risk workers, it will be possible to determine whether the wage difference is more attributable to the characteristics of the at-risk groups, or to the valuation of those characteristics in the labor market. Decompositions of the wage differential in the two time periods will aid policy makers in identifying those human capital traits that limit earnings for at-risk individuals. It will assist in formulating an educational policy to increase the human capital of at-risk individuals to be at par with those individuals who are not at risk and increase their competitiveness in the labor market. This may be done with the Oaxaca (1973) wage decomposition method

$$D = \frac{\overline{W}_{NR} / \overline{W}_{R} - (MP_{NR} / MP_{R})}{(MP_{NR} / MP_{R})} \tag{23}$$

Where, D = the difference in outcomes between at-risk and non at-risk groups

R = the at-risk group

NR = group not at risk

$\overline{W}_R, \overline{W}_{NR}$ average observed wages for both groups

MP_R, MP_{NR} marginal products for both groups

Applying logarithms to equation (23) the observed difference in wages becomes;

$$\overline{\ln W_{NR}} - \overline{\ln W_R} = \ln MP_{NR} - \ln MP_R + \ln(D+1) \tag{24}$$

The earnings function of both groups is estimated as shown above. Using the log wage equation (22) corrected for sample selection bias produces,

$$\overline{\ln W_{NR}} - \overline{\ln W_R} = \hat{\delta}_{1NR}\,\overline{X}_{NR} + \hat{\delta}_{3NR}\,\overline{\hat{\lambda}}_{NR} - \hat{\delta}_{1R}\,\overline{X}_R - \hat{\delta}_{3R}\,\overline{\hat{\lambda}}_R \tag{25}$$

$$\overline{\ln W_{NR}} - \overline{\ln W_R} = \left(\overline{X}_{NR} - \overline{X}_R\right)\hat{\delta}_{1NR} + \overline{X}_R(\hat{\delta}_{1NR} - \hat{\delta}_{1R}) + (\hat{\delta}_{3NR}\,\overline{\hat{\lambda}}_{NR} - \hat{\delta}_{3R}\,\overline{\hat{\lambda}}_R) \tag{26}$$

The first part of the equation (26) on the right-hand side measures skill difference. This is the gap in earnings due to differences in the average characteristics between the two groups. The second part measures differences due to at-risk status. The third part is the difference the wage offers faced by the two groups and is measured by the selectivity bias (Reimers 1983).

In the absence of any differences, between the groups, both the at-risk group and the non at-risk group would receive the same earnings as they would be perfect substitutes in the labor market. Any differences existing would be due to differences in human capital characteristics. Thus the same earnings structure should be expected for both groups, $\delta_R = \delta_{NR} = \delta^*$. If either group was overpaid or underpaid then some

unobservables would exist in the labor market and bring about this difference. The differential treatment leads to the over valuation of one group and under valuation of another. In a traditional wage decomposition this difference is looked upon as discrimination in favor of the advantaged group or against the disadvantaged group (Cotton 1988, Oaxaca and Ransom 1994). In order to allow for the decomposition of the earnings differential, a 'pooled' or weighted sample is typically used to obtain a non discriminatory wage structure.

In this study the at-risk indicator is developed based on factors existing in the 8th grade. Employers in the labor market cannot observe the at-risk indicator that allows for the identification of an at-risk individual. They are unable to make any decisions based on the risk indicator. While an employer may discriminate on the basis of past educational reports, race, gender or other characteristics correlated with at-risk status, one cannot assume that any form of discrimination based on at-risk status exists in the labor market. However there may be some unobservables existing in the labor market that may put an at-risk individual at a disadvantage in the labor market compared to non at-risk individuals. Therefore the decomposition of the wage differences allows for the distinction between those differences due to average characteristics and any unobservables. No weighting mechanism or pooled sample is used to further break down the differences. The wage decompositions are estimated for both 1993 and 1999, allowing for the observation of any changes in labor market outcomes over time by comparing the results from 1993 with those of 1999.

CHAPTER IV

EMPIRICAL RESULTS

This chapter covers the empirical results obtained from estimating the various models developed in Chapter III. Section A examines the academic outcomes. The first step is the identification of who is at-risk for dropping out of high school. Next follows the comparison of high school completion outcomes and post secondary education choices. Section B covers the labor market outcomes. An analysis of the labor market outcomes for 1993 and 1999 is followed by an analysis of the labor market decompositions.

A. Academic Outcomes

i. Identification of At-Risk Students

The initial step in this study was to determine those factors that may be used to identify which individuals are at-risk. In the NELS dataset, students were identified as being at-risk if they satisfied one or more of the following conditions;

1. single-parent family
2. parents who did not finish high school
3. have an older sibling who had dropped out of school
4. at home without adult supervision for more than three hours a day

5. limited proficiency in English
6. low income family i.e. less than $15,000 per annum

(Green 1995, p.2)

Therefore there already exists an at-risk identifier in the dataset. However these variables may not be a good predictor for at-risk status. These variables are used as a starting point in this analysis and are included in the initial estimation with other factors existing while the student was in the 8th grade. The aim is to determine pre-existing at-risk factors before the individual enters high school.

The dependent variable in the regression is high school graduation. The independent variables are socio-demographic factors as well as at-risk indicators previously identified from the base year questionnaire when the individual was in the eighth grade. The independent variables include gender, race, number of siblings, having an older sibling, family size, type of family, different levels of father's and mother's education. School variables include test scores, percent eligible for free lunch in the school, and the student-teacher ratio. Location and regional variables and the parents' employment status and occupational types were also included.

It is expected that all the at-risk variables will have negative coefficients indicating that they exert a negative influence on high school completion. Coming from a single parent family may increase the likelihood that the individual does not complete high school. Parent education may indicate the assistance and support an individual gets in completing high school. It may also reflect the aspirations parents may have for their children. Therefore students with parents having a low educational level may be less

likely to complete high school and therefore a negative coefficient for the variable may be expected. Having an older sibling who has dropped out of high school may influence a younger sibling to also drop out of high school. When an individual is home alone for three or more hours, s/he is not adequately supervised. The individual is more likely to engage in disruptive behavior and not focus on educational requirements. This individual is more likely to drop out of school, leading to a negative coefficient.

The results from the probit model in table 1 show some of the pre-identified at-risk factors are significant and negatively influencing high school completion. These factors are having parents who did not complete high school, having a sibling who has already dropped out of school, staying at home alone for three hours or more and coming from a low-income family. This shows that some of the pre-identified factors have some influence in determining whether an individual completes high school in line with other studies. Another variable that was highly significant is step family structure. (Ribar 1994 finds non-intact family and mother's education affected graduation)

The other significant factors (at the 99% level) that increased the likelihood that an individual completed high school are being Black, having a mother who worked, math test scores, the student-teacher ratio, and having a father who worked in the technical, sales and administrative occupations. These results are consistent with other studies where African-Americans were more likely than Whites to complete high school (see Rivkin 1995). At the 95% significance level, other family structure, family income between 15,000 and 35,000, and a south location also reduced the likelihood of graduation, while a rural location increased the probability of graduation.

Table 1. The Probability a Student Completes High School Given 8th Grade Conditions

Variable	Coefficient	Std. Error	Marginal Effect	Std. Error
Constant	-0.8130***	0.2733		
Single parent family	-0.2180	0.1587	-0.0272	0.0221
Low parent education	-0.1945***	0.0696	-0.0244**	0.0099
Sibling dropout	-0.4591***	0.0557	-0.0682***	0.0107
Home alone 3 or more hours	-0.1752***	0.0542	-0.0215***	0.0074
Limited English proficiency	0.1113	0.1154	0.0113	0.0107
Female	0.0805**	0.0409	0.0090**	0.0046
Black	0.3353***	0.0730	0.0297***	0.0051
Hispanic	0.1203*	0.0634	0.0124**	0.0061
Other race	0.2213***	0.0978	0.0210***	0.0079
Father's education -high school	0.0787	0.0549	0.0085	0.0058
Father's education -college	0.2448***	0.0847	0.0250***	0.0079
Father's education -other	0.2360***	0.0678	0.0234***	0.0061
Mother's education -high school	0.0767	0.0605	0.0083	0.0065
Mother's education -college	0.0501	0.0903	0.0054	0.0096
Mother's education -other	0.0897	0.0718	0.0096	0.0074
Mother works - 8th grade	0.1718***	0.0559	0.0211***	0.0076
Father works - 8th grade	-0.0302	0.0601	-0.0033	0.0064
Suburban location - 8th grade	0.0471	0.0543	0.0052	0.0060
Rural location - 8th grade	0.1358**	0.0562	0.0145**	0.0058
North Central location - 8th grade	-0.0409	0.0678	-0.0046	0.0077
South location - 8th grade	-0.1573**	0.0641	-0.0181**	0.0077
West location - 8th grade	-0.1425*	0.0772	-0.0169*	0.0098
Family size - 8th grade	-0.0344**	0.0146	-0.0038**	0.0016
Step family - 8th grade	-0.3927***	0.0581	-0.0552***	0.0101
Mother only family - 8th grade	-0.0233	0.1758	-0.0026	0.0200
Other family - 8th grade	-0.2664**	0.1168	-0.0357*	0.0186
Reading scores - 8th grade	0.0063**	0.0030	0.0007**	0.0003
Math scores - 8th grade	0.0386***	0.0034	0.0043***	0.0004
% Eligible for free lunch in school - 8th grade	-0.0022**	0.0010	-0.0002**	0.0001
Student-teacher ratio - 8th grade	0.0149***	0.0050	0.0017***	0.0006

Table 1. – Continued

Variable	Coefficient	Std. Error	Marginal Effect	Std. Error
Mother: tech, sales, admin - 8th grade	0.1295	0.0833	0.0134*	0.0080
Mother: managerial, professional - 8th grade	0.0921	0.0605	0.0099	0.0063
Mother: precision, craft & repair - 8th grade	-0.0791	0.1390	-0.0093	0.0173
Mother: ops, fabricators & laborers - 8th grade	-0.1067	0.0670	-0.0127	0.0085
Mother: other occupation - 8th grade	0.0209	0.0563	0.0023	0.0061
Father: tech, sales, admin - 8th grade	0.2646***	0.0936	0.0261***	0.0082
Father: managerial, professional - 8th grade	0.0786	0.0880	0.0083	0.0089
Father: precision, craft & repair - 8th grade	0.0509	0.0768	0.0055	0.0080
Father: ops, fabricators & laborers - 8th grade	0.0467	0.0688	0.0051	0.0074
Father: other occupation - 8th grade	0.0606	0.0753	0.0065	0.0078
Low family income <$15000	-0.5714***	0.1838	-0.0845**	0.0345
Family income $15000-<$35000	-0.3694**	0.1789	-0.0444*	0.0232
Family income $35000-<$50000	-0.3149*	0.1806	-0.0403	0.0263
Family income $50000-<$100000	-0.1698	0.1847	-0.0205	0.0242

Log likelihood = -2439.9437

*** significant at 99% ** significant at 95% * significant at 90%

The probit estimation was an important first step in determining those factors that affect high school completion while the student is in the eighth grade. It enabled the determination of those existing factors that negatively influence high completion. The

results were used to identify the factors that increase the likelihood of an individual dropping out of high school. All factors that were highly significant and negatively influenced graduation were selected. These are individual characteristics that policy makers may use in tailoring programs that assist at-risk individuals. Their marginal effect results were then ranked to see which factors had the most negative effect on graduation (see Table 1 for marginal effects).

Five factors were then chosen to identify at-risk individuals and create an at-risk indicator variable. These factors are; low parent education, sibling dropout, home alone, low family income, and step family. All these factors reduced the probability of high school completion. Any individual who had at least one of these factors was considered as at-risk for not completing high school. This gives us 3924 at-risk individuals or 42 percent of our sample. A total of 5440 individuals made up the non at-risk group.

Table 2 shows the number of students experiencing the risk factors. In the at-risk group, 2623 had only one risk factor with the breakdown as follows; 259 had low parent education, 294 sibling dropout, 668 home alone, 776 low family income, and 626 step family. A total of 976 students (10 % of the sample) had a combination of 2 factors, while 325 had a combination of 3 or more risk factors (less than four percent). Therefore 14 percent of the sample experienced a combination of risk factors. The majority of the at-risk students (67 %) experienced only one risk factor. Table 3 shows the breakdown of at-risk students by risk factor. The highest percentage of at-risk students had a low family income (18%), followed by those who were home alone 3 or more hours (12%).

Table 2. Number of At-Risk Students

	All At-Risk Students	% of Total Students	% of At-Risk Students
Students experiencing at least 1 risk factor	3924	41.9	100.0
Students experiencing only 1 risk factor	2623	28.0	66.8
Students experiencing 2 risk factors	976	10.4	24.9
Students experiencing 3 risk factors	286	3.1	7.3
Students experiencing more than 3 risk factors	39	0.4	1.0

Table 3. Breakdown of At-Risk Students by Risk Factor

	Low Parent Education	Sibling Dropout	Home Alone 3 Or More Hours	Low Family Income <$15000	Step Family - 8th Grade
% Of all students with this risk factor	9.8	8.7	12.3	17.9	11.1
% With risk factor experiencing only 1 risk factor	28.3	36.2	58.1	46.4	60.1
% With risk factor experiencing 1 more risk factor	45.4	37.3	27.9	36.2	29.6
% With risk factor experiencing 2 more risk factors	22.3	22.5	11.2	15.2	8.5
% With risk factor experiencing more than 2 risk factors	3.9	4.1	2.8	2.3	1.8

These factors provide a starting point in policy formulation as areas where policy makers may wish to target programs to assist at-risk individuals. They allow for the identification of at-risk individuals prior to entering high school, and for a point of departure for policy or programs targeted towards those at-risk.

ii. High School Completion

The regression estimates for high school completion are shown in tables 4, 5 and 6. The first regression was run that included all the students. It also included the at-risk indicator A, but did not include any of the identified at-risk factors as they were dropped due to collinearity. The regression was run based on some of the individual initial characteristics and 10^{th} and 12^{th} grade factors. The at-risk indicator variable in the pooled sample was significant at the 99% interval as expected. It indicates that given the high school conditions, a student identified as at-risk is three percentage points less likely to graduate from high school when compared with a student who is not identified as at-risk. This implies that the risk indicator is able to identify those students who are at-risk of not completing high school.

Family characteristics that affect high school graduation for all the students include race and family structure. Blacks were more likely to graduate than White students. These results were similar for the at-risk group where Blacks have a higher probability of graduation of nine percentage points compared to White students but only one percent for the non at-risk group. Compared to a traditional family, coming from an Other Family structure in the 10 grade reduced the probability of graduation for at-risk

students by about two percentage points. The level of parents' education is an important factor. If the father was a college graduate or had other education level, an individual

Table 4. The Probability that a Student Graduates Given High School Conditions

Variable	Coefficient	Std. Error	Marginal Effect	Std. Error
At-Risk	-0.3181***	0.0575	-0.0275***	0.0054
Female	0.107188	0.0483	0.0087**	0.004
Black	0.5962***	0.1028	0.0315***	0.0037
Hispanic	0.0578	0.0742	0.0045	0.0055
Other race	0.1052	0.1165	0.0078	0.008
Family size - 12th grade	-0.0006	0.0164	0.000	0.0013
Father's education -high school	0.0696	0.0631	0.0055	0.0049
Father's education - college	0.2777***	0.0977	0.0204***	0.0065
Father's education - other	0.2105***	0.0781	0.0153***	0.0051
Mother's education - high school	0.1658***	0.0643	0.0128***	0.0048
Mother's education - college	0.1165	0.0988	0.0089	0.0072
Mother's education - other	0.2159***	0.0789	0.0158***	0.0053
Mother works - 12th grade	0.1636**	0.0659	0.0148**	0.0067
Father works - 12th grade	-0.0339	0.0701	-0.0027	0.0054
Reading scores - 10th grade	0.0017	0.0037	0.0001	0.0003
Math scores - 10th grade	0.0516***	0.004	0.0042***	0.0003
Suburban location - 12th grade	0.3295***	0.0633	0.0253***	0.0048
Rural location - 12th grade	0.3463***	0.0677	0.0255***	0.0047
Midwest location - 12th grade	0.2006***	0.0727	0.0151***	0.0052
South location - 12thgrade	0.2281***	0.0707	0.0173***	0.0051
West location - 12thgrade	0.1631**	0.0821	0.0120**	0.0055
Step family - 12th grade	-0.0528	0.0885	-0.0044	0.0077
Step family - 10th grade	-0.1222	0.0914	-0.0107	0.0087
Mother only family - 10^{th} grade	-0.2017	0.2313	-0.0194	0.0261
Other family - 10th grade	-0.2250***	0.0842	-0.0209**	0.009
Mother only family - 12^{th} grade	-0.1682	0.2115	-0.0157	0.0226
Other family - 12th grade	-0.0871	0.0803	-0.0074	0.0072
Mother: tech, sales, admin - 12th grade	0.1495	0.0978	0.0111*	0.0066
Mother: managerial, professional - 12th grade	0.0669	0.07	0.0053	0.0054

Table 4. -- Continued

Variable	Coefficient	Std. Error	Marginal Effect	Std. Error
Mother: precision, craft & repair - 12th grade	-0.1376	0.169	-0.0125	0.0171
Mother: ops, fabricators & laborers - 12th grade	-0.1749**	0.0794	-0.0161*	0.0083
Mother: other occupation - 12th grade	-0.0554	0.0667	-0.0046	0.0057
Father: tech, sales, admin - 12th grade	0.2868***	0.1106	0.0203***	0.0068
Father: managerial, professional - 12th grade	0.0463	0.1025	0.0036	0.0078
Father: precision, craft & repair - 12th grade	0.0457	0.0912	0.0036	0.0069
Father: ops, fabricators & laborers - 12th grade	0.0605	0.0825	0.0048	0.0063
Father: other occupation - 12th grade	0.0382	0.0898	0.003	0.0069
% African - American in neighborhood - 1990	-0.0051***	0.0018	-0.0004***	0.0002
% public assistance in neighborhood - 1990	0.0103	0.0067	0.0008	0.0005
% unemployed in neighborhood - 1990	-0.1638**	0.0749	-0.0132**	0.0061
Average income in neighborhood - 1990	0.0100**	0.0043	0.0008**	0.0003
% low education in neighborhood - 1990	0.004	0.0056	0.0003	0.0005
% tech, sales, admin - 1990	-0.0062	0.0119	-0.0005	0.001
% managerial, professional - 1990	0.0052	0.0097	0.0004	0.0008
% precision, craft & repair - 1990	-0.0282*	0.0177	-0.0023*	0.0014
% operators, fabricators & laborers - 1990	0.0048	0.0108	0.0004	0.0009

Log likelihood = -1753.0542

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 5. Comparison of the Probability that a Student Graduates Given High School Conditions

	AT-RISK		NON AT-RISK	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
Constant	-2.5003***	0.2942	-1.9194***	0.3994
Female	0.1041*	0.0623	0.1265	0.0796
Black	0.6898***	0.1234	0.4147**	0.1927
Hispanic	0.1072	0.0925	-0.0351	0.1284
Other race	0.1941	0.1478	-0.0168	0.1885
Family size - 12th grade	-0.0041	0.0202	-0.0086	0.0296
Father's education -high school	0.0984	0.0772	0.0326	0.1195
Father's education –college	0.3391**	0.1393	0.2334	0.1513
Father's education –other	0.2066**	0.1017	0.2016	0.1338
Mother's education -high school	0.1451*	0.077	0.2392*	0.1255
Mother's education -college	-0.0274	0.1312	0.3110*	0.1657
Mother's education –other	0.2274**	0.1011	0.2577*	0.1396
Mother works - 12th grade	0.1902**	0.0787	0.1044	0.1245
Father works - 12th grade	-0.0326	0.0805	-0.0783	0.1509
Reading scores - 10th grade	0.0037	0.0049	-0.0023	0.0059
Math scores - 10th grade	0.0519***	0.0053	0.0520***	0.0065
Suburban location - 12th grade	0.3691***	0.0831	0.2890***	0.1005
Rural location - 12th grade	0.3792***	0.086	0.3493***	0.1153
Midwest location - 12th grade	0.0949	0.096	0.3130***	0.1151
South location - 12thgrade	0.1942**	0.0924	0.2396**	0.1137
West location - 12thgrade	0.085	0.1058	0.2723**	0.1359
Step family - 12th grade	-0.0033	0.1052	-0.0887	0.1727
Step family - 10th grade	-0.0694	0.1044	-0.297	0.2072
Mother only family - 10^{th} grade	-0.3951	0.2761	0.4612	0.4948
Other family - 10th grade	-0.1948*	0.1006	-0.3232**	0.1612
Mother only family - 12^{th} grade	0.1391	0.2624	-0.8593**	0.3758
Other family - 12th grade	-0.0792	0.0972	-0.0829	0.1493
Mother: tech, sales, admin - 12th grade	0.2308*	0.1381	0.0339	0.1467
Mother: managerial, professional - 12th grade	0.0021	0.0924	0.1166	0.115
Mother: precision, craft & repair - 12th grade	0.2288	0.2525	-0.5263**	0.2306
Mother: ops, fabricators & laborers - 12th grade	-0.1408	0.0975	-0.3060**	0.1399

Table 5. – Continued

Variable	AT-RISK Coefficient	AT-RISK Std. Error	NON AT-RISK Coefficient	NON AT-RISK Std. Error
Mother: other occupation - 12th grade	-0.0616	0.0819	-0.0902	0.1204
Father: tech, sales, admin - 12th grade	0.3371**	0.1602	0.268	0.1707
Father: managerial, professional - 12th grade	-0.1018	0.1334	0.2065	0.1714
Father: precision, craft & repair - 12th grade	0.0452	0.1132	0.0462	0.1594
Father: ops, fabricators & laborers - 12th grade	0.0478	0.1	0.0728	0.1512
Father: other occupation - 12th grade	-0.0418	0.1078	0.1837	0.1717
% African-American in neighborhood - 1990	-0.0070***	0.0022	-0.0006	0.0035
% public assistance in neighborhood - 1990	0.0171**	0.0082	-0.0056	0.0119
% unemployed in neighborhood - 1990	-0.1885**	0.0933	-0.1189	0.1291
Average income in neighborhood - 1990	0.0140**	0.0059	0.004	0.0063
% low education in neighborhood - 1990	0.0041	0.0068	0.0032	0.0101
% tech, sales, admin - 1990	-0.0245	0.0155	0.0195	0.0197
% managerial, professional - 1990	0.0116	0.0123	-0.0059	0.0163
% precision, craft & repair - 1990	-0.0425*	0.0223	0.0016	0.0305
% operators, fabricators & laborers - 1990	0.0011	0.0133	0.0129	0.0195

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 6. Comparison of the Marginal Effects of the Probability that a Student Graduates Given High School Conditions

Variable	AT-RISK Marginal Effect	AT-RISK Std. Error	NON AT-RISK Marginal Effect	NON AT-RISK Std. Error
Female	0.0196*	0.0118	0.0047	0.003
Black	0.0939***	0.0128	0.0105***	0.0033
Hispanic	0.0191	0.0158	-0.0013	0.0051
Other race	0.0325	0.0221	-0.0006	0.0072
Family size - 12th grade	-0.0008	0.0038	-0.0003	0.0011
Father's education -high school	0.0179	0.0137	0.0012	0.0043
Father's education –college	0.0544***	0.019	0.0083	0.0052
Father's education –other	0.0354**	0.016	0.0067*	0.004
Mother's education -high school	0.0264*	0.0137	0.0083*	0.0042
Mother's education -college	-0.0052	0.0251	0.0105**	0.0052
Mother's education –other	0.0390**	0.0158	0.0085**	0.0042
Mother works - 12th grade	0.0384**	0.0172	0.0043	0.0056
Father works - 12th grade	-0.006	0.0147	-0.0027	0.0048
Reading scores - 10th grade	0.0007	0.0009	-0.0001	0.0002
Math scores - 10th grade	0.0097***	0.001	0.0019***	0.0003
Suburban location - 12th grade	0.0643***	0.0138	0.0104***	0.0037
Rural location - 12th grade	0.0671***	0.0147	0.0114***	0.0035
Midwest location - 12th grade	0.0172	0.017	0.0104***	0.0036
South location - 12thgrade	0.0352**	0.0162	0.0082**	0.0036
West location - 12thgrade	0.0153	0.0185	0.0084**	0.0035
Step family - 12th grade	-0.0006	0.0197	-0.0036	0.0076
Step family - 10th grade	-0.0132	0.0206	-0.0151	0.0138
Mother only family - 10^{th} grade	-0.0919	0.0773	0.0106*	0.0063
Other family - 10th grade	-0.0387*	0.0217	-0.0162	0.0105
Mother only family - 12^{th} grade	0.0239	0.0412	-0.0783	0.0621
Other family - 12th grade	-0.0151	0.0187	-0.0033	0.0064
Mother: tech, sales, admin - 12th grade	0.0384*	0.0206	0.0012	0.0052
Mother: managerial, professional - 12th grade	0.0004	0.0172	0.0041	0.0039

Table 6. -- Continued

Variable	AT-RISK Marginal Effect	AT-RISK Std. Error	NON AT-RISK Marginal Effect	NON AT-RISK Std. Error
Mother: precision, craft & repair - 12th grade	0.0371	0.0353	-0.0339	0.0228
Mother: ops, fabricators & laborers - 12th grade	-0.028	0.0205	-0.0153*	0.0092
Mother: other occupation - 12th grade	-0.0117	0.0158	-0.0036	0.005
Father: tech, sales, admin - 12th grade	0.0535**	0.0211	0.009	0.0053
Father: managerial, professional - 12th grade	-0.02	0.0275	0.0066	0.0048
Father: precision, craft & repair - 12th grade	0.0083	0.0203	0.0017	0.0055
Father: ops, fabricators & laborers - 12th grade	0.0088	0.0183	0.0026	0.0051
Father: other occupation - 12th grade	-0.0079	0.0208	0.0059	0.0047
% African-American in neighborhood - 1990	-0.0013***	0.0004	0.0000	0.0001
% public assistance in neighborhood - 1990	0.0032**	0.0015	-0.0002	0.0004
% unemployed in neighborhood - 1990	-0.0352**	0.0174	-0.0044	0.0048
Average income in neighborhood - 1990	0.0026**	0.0011	0.0001	0.0002
% low education in neighborhood - 1990	0.0008	0.0013	0.0001	0.0004
% tech, sales, admin - 1990	-0.0046	0.0029	0.0007	0.0007
% managerial, professional - 1990	0.0022	0.0023	-0.0002	0.0006
% precision, craft & repair - 1990	-0.0079*	0.0042	0.0001	0.0011
% operators, fabricators & laborers - 1990	0.0002	0.0025	0.0005	0.0007

*** significant at 99% level ** significant at 95% level * significant at 90% level

was more likely to graduate from high school by an average of two percentage points for all students and four percentage points for the at-risk group. This reflects the influence a father may have through his own higher education level. Having a mother with a high school diploma increased the likelihood that an individual would graduate in all groups.

The only neighborhood variable that was significant was the percent unemployed in the neighborhood at the 95% level. An increase in the percent unemployed in the neighborhood reduced the likelihood of high school graduation for all groups by one percentage point for the all students group and by three percentage points. Rees and Mocan (1997) find that the lack of employment opportunities in New York State discourages students from dropping out of school in search of a job. Loss of family income, though, due to unemployment may encourage a student to drop out in search of employment. Therefore what may be occurring in this sample is compensation for reduction of family income.

Living in the suburbs or rural area increased the likelihood of high school completion, across all groups, compared to living in the urban area. The probability of high school graduation for those students residing in the suburbs or rural areas compared to those residing in an urban area increased for all students by about two percentage points. It increased by six percentage points for at-risk students, and one percentage point for non at-risk students. This shows that at-risk students are more responsive to suburban and rural schools, and are more likely to graduate there than in urban schools, when compared with non at-risk students. This may indicate a need to improve urban schools. Results from the other neighborhood variables may indicate that their influence,

while the individual is in high school, is limited and supports the findings from Solon, Page and Duncan (2000). These findings are contrary to other studies that show the importance of neighborhood variables (Teachman et al. 1997, Vartanian and Gleason 1999).

Overall the results from the high school regression were as expected for all groups. Only a few variables though were significant at any level for the non at-risk group. This limits us in making comparisons between the two sub-groups. The marginal effects were larger for the at-risk group for those variables that were significant. This may indicate that at-risk students are more sensitive to existing factors while they are in high school.

iii. Post Secondary Education Choices

This section analyzes the PSE choices high school graduates make. The students take different paths in their PSE choices. The path an individual took in obtaining his/her educational choice cannot be ascertained, limiting analysis to the final selection eight years after the expected graduation date. Thus there are five educational choices: no PSE, some PSE, certificate or associate degree, a bachelor's degree and postgraduate degree. The base category for comparison is no PSE. The focus is only on the choices that high school graduates make. While some students in the sample may have continued with post secondary education after obtaining a GED, they are not included in the analysis as they are considered as high school dropouts (see figure 1 and Cameron and Heckman 1994).

Table 7 shows the results from the ordered probit model of PSE choices for all three groups. The marginal effects from the estimation of the ordered probit model for the pooled sample of 8032 individuals are shown in table 8. Tables 9 and 10 show the marginal effects for the at-risk group and non at-risk group respectively. They were calculated at the means of the variables. The at-risk variable has a negative coefficient indicating that at-risk individuals are more likely to select lower levels of PSE than those individuals not at-risk. Being at-risk increases the probability of choosing no PSE by three percentage points. At-risk status decreases the probability of selecting a bachelor's degree by five percentage points. This would imply that most at-risk individuals are less likely to select any PSE higher than some PSE level. Alternatively it may suggest that those who are designated as at-risk are limited in some manner to their lower PSE choices.

Other important family variables included are being female, father's different levels of education, race, and family structure. Females are more likely to select higher levels of PSE than male individuals in all groups. Blacks, Hispanics and Other race individuals are more likely to undertake higher levels of PSE than White individuals in the pooled sample and in the at-risk group. Being Black or Hispanic decreased the probability of selecting no PSE. Blacks in the at-risk group are 10 percentage points more likely to select a bachelor's degree. Though this is surprising compared to other studies, it may indicate that Black graduates face problems in the labor market which force them to seek further education on order to overcome those problems (see Kain 1992). Blacks in the non at-risk group were also more likely to select a bachelor's degree

Table 7. Ordered Probit Estimates of Post Secondary Educational Outcomes

	ALL STUDENTS		AT-RISK		NON AT-RISK	
Variable	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
ATRISK	-0.1553***	0.0290				
FEMALE	0.2344***	0.0248	0.2094***	0.0401	0.2530***	0.0317
BLACK	0.2604***	0.0475	0.3758***	0.0641	0.1126	0.0723
HISPANIC	0.1618***	0.0416	0.2358***	0.0591	0.0883	0.0603
RACEOTH	0.2237***	0.0498	0.4024***	0.0824	0.1224*	0.0629
FEDHSG	0.0733*	0.0378	0.1326***	0.0506	0.0339	0.0605
FEDCG	0.6132***	0.0417	0.6653***	0.0658	0.5805***	0.0611
FEDOTH	0.2903***	0.0407	0.2886***	0.0584	0.2866***	0.0623
MWORK12	0.1183***	0.0416	0.1129**	0.0576	0.1417**	0.0606
FWORK12	0.0108	0.0421	0.0313	0.0531	0.0081	0.0702
READSC10	0.0127***	0.0019	0.0094***	0.0031	0.0148***	0.0025
MATHSC10	0.0386***	0.0020	0.0364***	0.0032	0.0399***	0.0026
SUBURB12	-0.0881***	0.0310	-0.0825*	0.0513	-0.0799**	0.0393
RURAL12	-0.1363***	0.0336	-0.1887***	0.0532	-0.0891**	0.0438
MIDWEST12	-0.0994***	0.0367	-0.1429**	0.0626	-0.0759*	0.0456
SOUTH12	-0.0580*	0.0362	-0.0934	0.0601	-0.0329	0.0459
WEST12	-0.1449***	0.0413	-0.1194*	0.0675	-0.1722***	0.0527
TFAM12	0.1588***	0.0274	0.0898**	0.0411	0.2002***	0.0373
AVINC	0.0050***	0.0008	0.0038***	0.0014	0.0057***	0.0010
Mu(1)	2.0110	0.1061	1.8481	0.1525	2.2647	0.1469
Mu(2)	3.1456	0.1080	2.9433	0.1552	3.4368	0.1497
Mu(3)	3.6282	0.1091	3.5713	0.1577	3.8375	0.1508
Mu(4)	5.4109	0.1162	5.1165	0.1729	5.7136	0.1592
Log Likelihood	-10073.916		-3971.0975		-6034.9447	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 8. Marginal Effects for Post Secondary Schooling Outcomes for All Students

	NO PSE		SOME PSE		CERT/ASSOC		BACHELOR		POST GRAD	
Variable	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
ATRISK	0.0262***	0.0051	0.0347***	0.0064	-0.0019***	0.0006	-0.0520***	0.0097	-0.0070***	0.0013
FEMALE	-0.0391***	0.0043	-0.0526***	0.0056	0.0023***	0.0007	0.0784***	0.0083	0.0109***	0.0013
BLACK	-0.0370***	0.0058	-0.0620***	0.0117	-0.0031*	0.0016	0.0867***	0.0155	0.0153***	0.0035
HISPANIC	-0.0245***	0.0058	-0.0379***	0.0100	-0.0005	0.0007	0.0542***	0.0139	0.0086***	0.0026
RACEOTH	-0.0323***	0.0063	-0.0530***	0.0122	-0.0021	0.0015	0.0747***	0.0164	0.0128***	0.0035
FEDHSG	-0.0118**	0.0060	-0.0168*	0.0087	0.0004*	0.0002	0.0246*	0.0127	0.0036*	0.0019
FEDCG	-0.0872***	0.0055	-0.1425***	0.0099	-0.0079***	0.0021	0.1995***	0.0128	0.0380***	0.0038
FEDOTH	-0.0428***	0.0054	-0.0682***	0.0099	-0.0020*	0.0012	0.0968***	0.0133	0.0163***	0.0028
MWORK12	-0.0207***	0.0078	-0.0259***	0.0088	0.0020*	0.0011	0.0396***	0.0139	0.0050***	0.0016
FWORK12	-0.0018	0.0070	-0.0024	0.0095	0.0001	0.0004	0.0036	0.0141	0.0005	0.0019
READSC10	-0.0021***	0.0003	-0.0029***	0.0004	0.0001***	0.0000	0.0043***	0.0007	0.0006***	0.0001
MATHSC10	-0.0064***	0.0004	-0.0087***	0.0005	0.0003***	0.0001	0.0130***	0.0007	0.0018***	0.0001
SUBURB12	0.0147***	0.0052	0.0199***	0.0070	-0.0009**	0.0004	-0.0296***	0.0104	-0.0041***	0.0014
RURAL12	0.0232***	0.0059	0.0304***	0.0074	-0.0017***	0.0007	-0.0457***	0.0112	-0.0061***	0.0015
MWEST12	0.0168***	0.0064	0.0222***	0.0081	-0.0012*	0.0006	-0.0333***	0.0123	-0.0045***	0.0016
SOUTH12	0.0097	0.0061	0.0131	0.0081	-0.0006	0.0005	-0.0195*	0.0122	-0.0027*	0.0016
WEST12	0.0254***	0.0077	0.0318***	0.0087	-0.0025**	0.0011	-0.0485***	0.0137	-0.0062***	0.0016
TFAM12	-0.0268***	0.0048	-0.0355***	0.0061	0.0019***	0.0006	0.0532***	0.0092	0.0072***	0.0013
AVINC	-0.0008***	0.0001	-0.0011***	0.0002	0.0000***	0.0000	0.0017***	0.0003	0.0002***	0.0000

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 9. Marginal Effects for Post Secondary Schooling Outcomes for At-Risk Students

	NO PSE		SOME PSE		CERT/ASSOC		BACHELOR		POST GRAD	
Variable	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
FEMALE	-0.0545***	0.0106	-0.0276***	0.0054	0.0215***	0.0044	0.0552***	0.0105	0.0054***	0.0012
BLACK	-0.0843***	0.0124	-0.0647***	0.0132	0.0280***	0.0036	0.1072***	0.0193	0.0138***	0.0035
HISPANIC	-0.0564***	0.0131	-0.0371***	0.0106	0.0206***	0.0045	0.0655***	0.0171	0.0074***	0.0024
RACEOTH	-0.0870***	0.0146	-0.0725***	0.0179	0.0271***	0.0033	0.1164***	0.0253	0.0160***	0.0049
FEDHSG	-0.0334***	0.0124	-0.0190**	0.0077	0.0128***	0.0047	0.0358***	0.0139	0.0037**	0.0016
FEDCG	-0.1359***	0.0108	-0.1241***	0.0151	0.0361***	0.0035	0.1932***	0.0202	0.0307***	0.0057
FEDOTH	-0.0680***	0.0126	-0.0464***	0.0109	0.0243***	0.0042	0.0807***	0.0171	0.0095***	0.0026
MWORK12	-0.0302	0.0160	-0.0139**	0.0064	0.0122*	0.0066	0.0292**	0.0145	0.0027**	0.0013
FWORK12	-0.0082	0.0139	-0.0042	0.0069	0.0032	0.0056	0.0083	0.0140	0.0008	0.0013
READSC10	-0.0024***	0.0008	-0.0013***	0.0004	0.0010***	0.0003	0.0025***	0.0008	0.0002***	0.0001
MATHSC10	-0.0094***	0.0008	-0.0049***	0.0005	0.0037***	0.0004	0.0097***	0.0009	0.0010***	0.0001
SUBURB12	0.0215	0.0135	0.0109*	0.0067	-0.0085	0.0054	-0.0218*	0.0135	-0.0021*	0.0013
RURAL12	0.0498***	0.0144	0.0242***	0.0065	-0.0198***	0.0059	-0.0494***	0.0137	-0.0047***	0.0014
MWEST12	0.0380**	0.0171	0.0180**	0.0073	-0.0152**	0.0070	-0.0372***	0.0159	-0.0035**	0.0015
SOUTH12	0.0244	0.0158	0.0124*	0.0077	-0.0097	0.0064	-0.0247	0.0157	-0.0024	0.0015
WEST12	0.0318	0.0186	0.0149*	0.0077	-0.0128*	0.0076	-0.0310*	0.0171	-0.0029*	0.0015
TFAM12	-0.0229**	0.0104	-0.0125**	0.0059	0.0089**	0.0040	0.0240**	0.0111	0.0024**	0.0012
AVINC	-0.0010***	0.0004	-0.0005***	0.0002	0.0004***	0.0002	0.0010***	0.0004	0.0001**	0.0000

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 10. Marginal Effects for Post Secondary Schooling Outcomes for Non At-Risk Students

	NO PSE		SOME PSE		CERT/ASSOC		BACHELOR		POST GRAD	
Variable	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error	Marginal Effect	Std. Error
FEMALE	-0.0293***	0.0039	-0.0635***	0.0081	-0.0078***	0.0012	0.0831***	0.0105	0.0175***	0.0024
BLACK	-0.0119*	0.0070	-0.0285	0.0183	-0.0044	0.0033	0.0362*	0.0226	0.0086	0.0061
HISPANIC	-0.0095	0.0061	-0.0224	0.0153	-0.0033	0.0026	0.0286	0.0192	0.0066	0.0048
RACEOTH	-0.0129**	0.0061	-0.0310*	0.0159	-0.0048*	0.0030	0.0393**	0.0196	0.0094*	0.0053
FEDHSG	-0.0038	0.0068	-0.0086	0.0153	-0.0011	0.0021	0.0111	0.0198	0.0024	0.0043
FEDCG	-0.0620***	0.0066	-0.1436***	0.0148	-0.0224***	0.0032	0.1816***	0.0180	0.0464***	0.0061
FEDOTH	-0.0292***	0.0057	-0.0722***	0.0156	-0.0121***	0.0034	0.0904***	0.0186	0.0231***	0.0059
MWORK12	-0.0178**	0.0084	-0.0353**	0.0149	-0.0032***	0.0009	0.0476**	0.0207	0.0088***	0.0034
FWORK12	-0.0009	0.0081	-0.0021	0.0177	-0.0003	0.0022	0.0027	0.0232	0.0006	0.0048
READSC10	-0.0017***	0.0003	-0.0037***	0.0006	-0.0005***	0.0001	0.0049***	0.0008	0.0010***	0.0002
MATHSC10	-0.0046***	0.0003	-0.0101***	0.0007	-0.0013***	0.0001	0.0131***	0.0009	0.0028***	0.0002
SUBURB12	0.0092**	0.0046	0.0202**	0.0099	0.0025**	0.0012	-0.0264**	0.0130	-0.0055**	0.0027
RURAL12	0.0105**	0.0053	0.0224**	0.0110	0.0026**	0.0012	-0.0295**	0.0146	-0.0060**	0.0029
MIDWEST12	0.0089*	0.0055	0.0191*	0.0115	0.0023*	0.0013	-0.0251*	0.0152	-0.0051*	0.0030
SOUTH12	0.0038	0.0054	0.0083	0.0116	0.0010	0.0014	-0.0108	0.0152	-0.0023	0.0031
WEST12	0.0216***	0.0072	0.0429***	0.0129	0.0040***	0.0009	-0.0577***	0.0179	-0.0108***	0.0030
TFAM12	-0.0249***	0.0051	-0.0500***	0.0094	-0.0048***	0.0008	0.0670***	0.0127	0.0127***	0.0023
AVINC	-0.0006***	0.0001	-0.0014***	0.0002	-0.0002***	0.0000	0.0019***	0.0003	0.0004***	0.0001

*** significant at 99% level ** significant at 95% level * significant at 90% level

(3%), but this was significant only at the 90% level. This supports Rivkin's (1995) study that showed that Blacks are more likely than Whites to go to college. Being of the Other race also decreased the probability of selecting no PSE and increased the probability of a bachelor's degree by seven percentage points in the all students group and by 11% in the at-risk group.

Being in a traditional family in the 12th grade was positive and highly significant in the non at-risk group and the all students group. A student from a traditional family in the at-risk group is two percentage points more likely to select a bachelor's degree. Having a father with a high school diploma or higher educational qualifications increased the probability that an individual from the pooled sample or the at-risk group would select a higher level of education. Having a father with a college degree or other qualifications increased the likelihood of individuals from all groups selecting a higher level of education. For all groups having a father with a college education level increased the likelihood that an individual pursued a bachelor's degree by an average of 18%. This indicates the importance of encouraging an individual to undertake college education as it may increase the likelihood that their child(ren) would also select to go to college. These results are similar to other studies, (Hearn 1991, van Ophem and Jonker 1997) which show that parents' education and ability (measured by test scores) are good predictors of college attendance.

The effect of a higher reading score and a higher math score in the 10th grade reduces the probability of selecting no PSE and increases the probability of selecting a bachelor's degree. Students residing in the Midwest and west were less likely to select

higher levels of PSE as compared to those residing in the north in all three groups. As the average neighborhood income increased an individual was more likely to select a bachelor's degree and less likely to select a lower level of PSE. This may suggest the impact of peers and family resource and expectations. Students may be selecting lower levels of PSE due to financial considerations, home responsibilities, and lack of positive role models. These variables though significant had a small or negligible marginal effect on PSE selection.

Though at-risk individuals are less likely to select a Bachelor's degree, having a father who has a college degree has a greater impact on positively influencing a student's decision to undertake a Bachelor's degree. The marginal effect of this variable is much larger than the other variables. This may suggest that individuals are more responsive to paternal educational level in their decision to undertake a Bachelor's degree. Race and gender also have a positive effect in influencing an individual's Bachelor's degree selection. What these factors indicate is that programs based on minorities and gender may mitigate the effects of at-risk status.

As the main interest is comparing at-risk individual PSE choices with those non at-risk individuals, the next step is to predict whether the PSE outcomes will differ for at-risk status holding other characteristics constant. Table 11 shows the predicted educational choices for the two groups before and after adjusting for individual, family, school and other characteristics. The unadjusted columns show the distribution of the two groups into the PSE choices. Though a large percentage (35.5%) of the at-risk students in the sample chose some PSE, after adjustment the majority choose to have a

Bachelor's degree, 37.8%. The distribution of the at-risk group more closely resembles that of the non at-risk group. Actually a greater percentage of at-risk students would choose to get a college degree and post-graduate studies than non at-risk students. This may indicate that given similar circumstances, at-risk PSE choices would be similar to those who are not at risk.

Table 11. Comparison of PSE Outcomes

	Unadjusted		Adjusted	
	At-Risk	Non At-Risk	At-Risk	Non At-Risk
NO PSE	21.1	10.0	12.3	16.0
SOME PSE	35.5	27.6	29.1	31.8
CERT/ASSOC	19.3	12.7	15.7	15.5
BACHELOR	21.7	43.7	37.8	33.2
POST GRAD	2.3	6.1	5.0	3.5
Total	100	100	100	100

Comparison of PSE outcomes in table 11 shows that compared to a comparable non at-risk student, an at-risk individual will select a Bachelor's degree and not a lower level of education. Factors that influence PSE choice impact them as well as those not at-risk, but they are more likely to actually end in the lower level of PSE. At-risk students are at a disadvantage based on their human capital endowments. A starting point would be to focus on males who are more likely to select lower levels of education than females. This will ultimately affect their children's PSE choices.

B. Labor Market Outcomes

In this section the analysis is of labor market outcomes for two distinct periods, 1993 and 1999. The main focus is to see whether at-risk individuals are at a disadvantage in the labor market when compared to non at-risk individuals, and whether the disadvantages, if any exist six years after graduation.

Table C1 shows the descriptive statistics of the labor market variables for 1993 and 1999 for those individuals who had graduated from high school. Thirty-seven percent of the sample was at-risk individuals in both years. In 1993, seven percent were married and this figure had risen to 41 percent in 1999. A quarter of the sample had no PSE in 1993, but this number had fallen to 13 % in 1999. The number of children had increased.

The inclusion of hours worked in the wage estimation may lead to problems of endogeneity or other specification problems. In order to correct for this an Instrumental Variable approach is used. A Heckman Two-step Sample Selection model is initially estimated for the hours worked. Then the predicted hours obtained after this estimation are used in the Heckman Two-step Sample Selection earnings model. (The results from the hours estimation are included in Appendix C) Comparison is then made between the risk groups of all students, those with no PSE in 1993 and 1999, and between graduates with a Bachelor's degree in 1999. Decomposition of the wage differences follows in order to discern whether these differences arise due to human capital and other characteristics or to differences in how those characteristics are valued in the labor market.

i. Labor Market Outcomes in 1993

The results from the Heckman Two-step Sample Selection model are shown in tables 12 and 13. Surprisingly, the at-risk coefficient in the labor market participation equation was not at all significant. This indicates that at-risk status is not a determinant in influencing labor market participation, or that the at-risk designation may be highly correlated with other factors in the equation. Being female with a small child reduced the likelihood that an individual joined the labor market. This is consistent with other studies, as it has been shown that women are less likely to enter the labor market. A single parent was more likely to enter the labor market. Race is a limiting factor as Blacks and other races were less likely to enter the labor market in 1993. Students from all groups were less likely to enter the labor market. The higher the other income one had, the less likely an individual entered the labor market. These results were similar across the risk groups.

In the earnings equation the at-risk indicator variable is marginally significant at the 90% level. The λ variable is significant and negative for the pooled sample and the other sub-groups. This indicates that there is negative self-selection in all the groups. Individuals may delay entering the labor force due to some unforeseen circumstances. This may also be due to omitted characteristics in both the earnings and labor market participation equations. The more predicted hours an individual worked the higher the wages earned in all groups. Weekly earnings are higher in all other industries compared to the service industry for those individuals in the all students and non at-risk groups. The other race received higher earnings than whites as has been shown in other studies (see Crawford, Johnson and Summers 1997).

Table 12. Labor Market Outcomes for All Students

	1993		1999	
	Coefficient	Std. Err	Coefficient	Std. Err.
Log Weekly Pay				
At Risk	0.102*	0.062	-0.078***	0.020
Predicted Hours	0.079**	0.035	0.026**	0.012
Work Experience	0.076***	0.008	0.007***	0.001
Work Experience Squared	-0.001***	0.000	0.000***	0.000
Female	0.075	0.126	-0.119*	0.066
Black	0.001	0.125	-0.123***	0.034
Hispanic	0.161	0.101	-0.006	0.028
Other Race	0.345**	0.165	0.087**	0.036
No PSE	0.061	0.090	-0.183***	0.025
Student	0.212	0.144	-0.015	0.076
Technical, Sales, Admin	-0.077	0.205	0.057**	0.028
Managerial, professional	-0.245	0.364	0.147***	0.041
Precision, craft & repair	-0.568	0.414	0.077	0.057
Ops, fabricators & laborers	-0.549	0.370	-0.011	0.038
Other Occupation	-1.501*	0.811	-0.150	0.134
Government Employee	-0.064	0.164	0.009	0.027
Other Employee	0.302	0.336	0.003	0.070
Agriculture Industry	0.833***	0.255	0.191**	0.078
Mining and Construction	0.537**	0.218	0.134***	0.042
Trans, Comm, Utilities	0.625***	0.236	0.214***	0.068
Wholesale and Retail Trade	0.271***	0.093	-0.051*	0.026
Financial Industry	0.403***	0.143	0.122***	0.026
Manufacturing	0.702***	0.142	0.121***	0.029
Public Industry	0.789***	0.214	-0.080**	0.040
Constant	1.531	1.197	5.246***	0.557
Lambda	-1.680***	0.440	-0.538	0.248
Selection Equation				
At Risk	-0.068	0.049	-0.087**	0.043
Marital Status	0.032	0.100	0.254***	0.053
Number of children	-0.009	0.114	-0.108***	0.032
Female	-0.059	0.047	-0.022	0.044
Single Parent	0.148**	0.058	0.180**	0.084
Female with Small Child	-0.708***	0.155	-0.065	0.073
Student	-0.253***	0.051	-0.018	0.051
Black	-0.357***	0.078	0.034	0.078
Hispanic	-0.103	0.073	0.048	0.065
Other Race	-0.528***	0.075	-0.044	0.079
Other Income	-0.012***	0.004	-0.001	0.001
Constant	1.106***	0.055	1.091***	0.039

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 13. Comparison of Labor Market Outcomes in 1993

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Log Weekly Pay				
Predicted Hours	0.140**	0.068	0.089*	0.054
Work Experience	0.073***	0.016	0.074***	0.007
Work Experience Squared	-0.001***	0.000	-0.001***	0.000
Female	0.274	0.264	0.103	0.164
Black	0.005	0.210	0.106	0.150
Hispanic	0.223	0.181	0.213	0.133
Other Race	0.752**	0.382	0.270	0.169
No PSE	0.071	0.173	0.075	0.092
Student	0.458	0.315	0.212	0.167
Technical, Sales, Admin	-0.435	0.378	-0.108	0.310
Managerial, professional	-0.841	0.725	-0.383	0.536
Precision, craft & repair	-1.435	0.923	-0.629	0.521
Ops, fabricators & laborers	-1.070	0.727	-0.760	0.551
Other Occupation	-2.776*	1.474	-1.845	1.284
Government Employee	-0.239	0.289	0.136	0.180
Other Employee	-0.349	0.809	0.473	0.304
Agriculture Industry	0.764	0.528	0.879***	0.247
Mining and Construction	0.242	0.407	0.729***	0.230
Trans, Comm, Utilities	0.542	0.421	0.754***	0.255
Wholesale and Retail Trade	0.140	0.177	0.345***	0.096
Financial Industry	0.211	0.274	0.522***	0.147
Manufacturing	0.479*	0.263	0.866***	0.150
Public Industry	0.744*	0.381	0.740***	0.234
Constant	-0.203	2.300	1.053	1.871
Lambda	-2.146***	0.718	-1.257***	0.390
Selection Equation				
Marital Status	-0.005	0.131	0.059	0.158
Number of children	0.060	0.139	-0.069	0.203
Female	0.033	0.078	-0.118**	0.059
Female with Small Child	-0.785***	0.198	-0.649**	0.261
Student	-0.207***	0.077	-0.285***	0.069
Single Parent	-0.004	0.085	0.280***	0.082
Black	-0.303***	0.107	-0.439***	0.115
Hispanic	-0.154	0.099	-0.031	0.109
Other Race	-0.501***	0.125	-0.541***	0.094
Other Income	-0.025***	0.008	-0.008**	0.004
Constant	1.056***	0.084	1.125***	0.069
No of Observations	1132		1960	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Surprisingly, at-risk status does not negatively affect earnings. The results indicate that at-risk individuals, on average, ceteris paribus, have higher earnings than non at-risk individuals in 1993. Therefore, as a group, at-risk individuals may not be at a disadvantage compared to non at-risk individuals. As the group of high school graduates is not homogeneous there may be some human capital characteristics that are not captured. It is expected that with a more homogeneous group of individuals, those who are designated as at-risk will be at a disadvantage. In order to account for the differences existing within risk groups additional estimations are run for those individuals with no PSE and college graduates in order to have more homogeneous groups for comparison. In order to account for this selection, the models for individuals without PSE and college graduates are estimated and the results compared across all groups and years.

ii. Labor Market Outcomes in 1999

The Heckman Two-step Sample Selection model was run using data from 1999. A similar model to the 1993 estimation was run and the results are shown in tables 12 and 14. At-risk status now affects labor market participation. At-risk individuals are less likely to enter the labor market. The coefficients on the λ's are either marginally significant or insignificant. As the number of children increased the likelihood of participating in the labor market decreased for all groups indicating the need to support oneself and one's children. Married persons in the all groups are more likely to enter the labor market than unmarried persons.

Table 14. Comparison of Labor Market Outcomes in 1999

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Log Weekly Pay				
Predicted Hours	-0.077	0.059	0.037***	0.010
Work Experience	0.005***	0.001	0.008***	0.001
Work Experience Squared	0.000***	0.000	0.000***	0.000
Female	-0.693**	0.307	-0.036	0.057
Black	-0.045	0.053	-0.184***	0.050
Hispanic	-0.011	0.041	0.036	0.041
Other Race	0.073	0.066	0.071*	0.042
No PSE	-0.200***	0.037	-0.164***	0.036
Student	-0.590*	0.345	0.040	0.067
Technical, Sales, Admin	0.023	0.048	0.048	0.036
Managerial, professional	0.396***	0.153	0.123***	0.042
Precision, craft & repair	0.105	0.090	0.077	0.073
Ops, fabricators & laborers	0.142	0.099	-0.025	0.047
Other Occupation	0.398	0.380	-0.235*	0.141
Government Employee	0.031	0.048	-0.001	0.032
Other Employee	0.023	0.120	-0.014	0.087
Agriculture Industry	0.181	0.120	0.206**	0.102
Mining and Construction	0.166**	0.066	0.089*	0.054
Trans, Comm, Utilities	0.204	0.111	0.230***	0.086
Wholesale and Retail Trade	-0.094	0.042	-0.021	0.033
Financial Industry	0.155***	0.046	0.103***	0.031
Manufacturing	0.102**	0.049	0.130***	0.035
Public Industry	-0.056	0.077	-0.091**	0.046
Constant	9.761***	2.622	4.698***	0.472
Lambda	-0.585*	0.329	-0.430	0.325
Selection Equation				
Marital Status	0.320***	0.087	0.220***	0.067
Number of children	-0.097**	0.044	-0.138***	0.047
Female	0.027	0.072	-0.058	0.056
Female with Small Child	-0.161	0.104	0.034	0.105
Single Parent	0.243**	0.117	0.131	0.123
Student	0.026	0.083	-0.038	0.064
Black	0.046	0.103	0.002	0.120
Hispanic	0.010	0.085	0.107	0.102
Other Race	-0.066	0.128	-0.037	0.101
Other Income	0.000	0.002	-0.001	0.001
Constant	0.941***	0.064	1.130***	0.046
No of Observations	1950		3318	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Unlike in 1993, at-risk status now negatively affects earnings. A person designated as at-risk will earn less in the labor market than one who is not at-risk. Black individuals earn less then whites for the aggregate and the non at-risk group. The more predicted hours an individual works the higher the weekly earnings for the aggregate group and the non at-risk group. Work experience and experience squared are also significant but are too small to make any meaningful interpretation.

Many of the industry variables are significant for all groups in 1999. Mining and construction industry, manufacturing industry and the financial industry had higher earnings than the service sector for all groups. Of the occupational variables, only the managerial and professional occupations variable was significant for all groups. It indicated that those working in this occupation have higher earnings than those in the service sector. Those working in the technical, sales and administration and craft occupations from the aggregate group earned higher wages than individuals in the service occupation group. Individuals who only had a high school diploma earned less weekly wages in all groups.

iii. Comparison of Labor Market Outcomes for Individuals with no PSE

The number of individuals without PSE was 756 in 1993. By 1999, this number had fallen to 703, with the majority of individuals who obtained PSE coming from the non at-risk group. The results from the Heckman Two-step Selection models are shown in tables 15, 16 and 17. The labor market outcomes for the pooled group were compared across years, then between the at-risk groups for both years.

Table 15. Labor Market Outcomes of Students With No PSE

	1993		1999	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Log Weekly Pay				
At Risk	0.106	0.066	-0.041	0.084
Predicted Hours	-0.101**	0.048	-0.219**	0.099
Work Experience	0.063***	0.010	0.002	0.003
Work Experience Squared	-0.001***	0.000	0.000	0.000
Female	-0.548***	0.209	-1.920**	0.768
Black	-0.157	0.106	0.012	0.137
Hispanic	-0.108	0.096	0.372**	0.168
Other Race	0.205	0.154	0.188	0.191
Technical, Sales, Admin	0.086	0.093	0.181*	0.103
Managerial, professional	0.850***	0.243	0.995***	0.357
Precision, craft & repair	0.835***	0.327	-0.008	0.170
Ops, fabricators & laborers	0.662***	0.253	0.558***	0.173
Other Occupation	2.200***	0.929	1.822**	0.780
Government Employee	-0.234	0.152	-0.020	0.150
Other Employee	0.367	0.286	-0.086	0.370
Agriculture Industry	0.643***	0.206	-0.019	0.251
Mining and Construction	0.436**	0.185	0.160	0.125
Trans, Comm, Utilities	0.740***	0.198	0.136	0.225
Wholesale and Retail Trade	0.167	0.105	-0.036	0.090
Financial Industry	0.516***	0.132	0.086	0.114
Manufacturing	0.714***	0.129	-0.008	0.095
Public Industry	0.893***	0.183	0.052	0.274
Constant	8.352***	1.842	15.755***	4.269
Lambda	-0.045	0.391	-0.944	0.715
Selection Equation				
At Risk	-0.257**	0.107	0.025	0.117
Marital Status	0.008	0.142	-0.047	0.170
Number of children	-0.043	0.145	-0.134**	0.065
Female	-0.092	0.124	-0.351***	0.134
Single Parent	-0.008	0.118	0.070	0.199
Female with Small Child	-0.845***	0.215	0.077	0.171
Black	-0.267*	0.158	-0.035	0.209
Hispanic	-0.152	0.151	0.124	0.177
Other Race	-0.573***	0.201	0.073	0.290
Other Income	-0.056***	0.013	0.003	0.004
Constant	1.509***	0.115	1.362***	0.132
No of Observations	756		703	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 16. Comparison of Labor Market Outcomes of Students With No PSE in 1993

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Log Weekly Pay				
Predicted Hours	-0.197***	0.059	0.082	0.097
Work Experience	0.061***	0.014	0.075**	0.031
Work Experience Squared	-0.001***	0.000	-0.002*	0.001
Female	-0.741***	0.198	0.336	0.558
Black	-0.162	0.137	-0.155	0.345
Hispanic	0.004	0.123	-0.324	0.327
Other Race	-0.133	0.244	-0.397	0.579
Technical, Sales, Admin	0.176	0.122	0.240	0.276
Managerial, professional	1.684***	0.359	-0.090	0.431
Precision, craft & repair	2.067***	0.530	-0.354	0.491
Ops, fabricators & laborers	1.272***	0.334	-0.320	0.529
Other Occupation	3.921***	1.107	-1.407	1.893
Government Employee	-0.416**	0.188	0.171	0.431
Other Employee	0.165	0.553	0.460	0.586
Agriculture Industry	0.347	0.319	0.800*	0.483
Mining and Construction	-0.035	0.260	0.901*	0.462
Trans, Comm, Utilities	0.409	0.273	1.134**	0.517
Wholesale and Retail Trade	-0.066	0.152	0.356	0.249
Financial Industry	0.347*	0.198	0.649**	0.306
Manufacturing	0.340*	0.183	1.039***	0.323
Public Industry	0.787***	0.237	0.661	0.498
Constant	12.232***	2.250	1.008	3.885
Lambda	0.604	0.477	-1.639	1.172
Selection Equation				
Marital Status	0.001	0.177	0.054	0.242
Number of children	0.031	0.177	-0.211	0.257
Female	-0.100	0.158	-0.066	0.203
Female with Small Child	-0.871***	0.271	-0.816**	0.359
Single Parent	0.003	0.152	-0.003	0.192
Black	-0.266	0.189	-0.291	0.289
Hispanic	-0.175	0.177	-0.102	0.297
Other Race	-0.695***	0.252	-0.369	0.343
Other Income	-0.062***	0.019	-0.052***	0.019
Constant	1.256***	0.145	1.508***	0.153
No of Observations	396		360	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 17. Comparison of Labor Market Outcomes of Students With No PSE in 1999

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Log Weekly Pay				
Predicted Hours	-0.206**	0.094	-0.202	0.219
Work Experience	0.002	0.003	0.003	0.009
Work Experience Squared	0.000	0.000	0.000	0.000
Female	-1.882***	0.691	-2.038	1.937
Black	-0.101	0.127	0.945	0.978
Hispanic	0.626***	0.235	0.457	0.472
Other Race	0.339*	0.201	0.526	0.775
Technical, Sales, Admin	0.254**	0.115	0.140	0.281
Managerial, professional	0.810***	0.277	1.127	0.981
Precision, craft & repair	-0.022	0.216	0.026	0.383
Ops, fabricators & laborers	0.658***	0.198	0.337	0.321
Other Occupation	-1.001	0.697	3.060	3.079
Government Employee	-0.151	0.152	0.276	0.482
Other Employee	0.618	0.426	-0.782	0.952
Agriculture Industry	0.014	0.355	-0.024	0.555
Mining and Construction	0.147	0.144	0.147	0.323
Trans, Comm, Utilities	0.128	0.280	0.122	0.542
Wholesale and Retail Trade	-0.077	0.100	0.007	0.244
Financial Industry	0.092	0.130	0.054	0.301
Manufacturing	-0.015	0.103	-0.021	0.265
Public Industry	-0.652**	0.325	0.706	0.685
Constant	14.429***	3.952	15.518	9.823
Lambda	0.587	0.677	-1.618	1.802
Selection Equation				
Marital Status	-0.162	0.232	0.091	0.260
Number of children	-0.116	0.081	-0.164	0.111
Female	-0.421	0.178	-0.259	0.210
Female with Small Child	0.070	0.215	0.210	0.296
Single Parent	0.083	0.264	-0.042	0.315
Black	0.097	0.265	-0.302	0.347
Hispanic	0.319	0.219	-0.262	0.305
Other Race	0.199	0.402	-0.074	0.428
Other Income	0.004	0.005	0.001	0.006
Constant	1.400***	0.183	1.365***	0.167
No of Observations	397		306	

*** significant at 99% level ** significant at 95% level * significant at 90% level

In 1993, the at-risk coefficient in the labor market participation equation for the pooled group is significant and negative. At-risk individuals without PSE were less likely to join the labor market. Females with small children were less likely to join the labor market across all groups. Also having other income reduced the likelihood of labor market participation across all groups.

In the earnings equation, the at-risk indicator variable was not significant. Increasing predicted hours lowered weekly earnings for the pooled group and the at-risk group. This is counter to what was expected and to the results for the individuals, with and without PSE. Increasing work experience increased earnings for both groups, but was too small for any meaningful interpretation.

In 1999, the at-risk coefficient was insignificant in the labor market participation equation, unlike 1993. Females were less likely to enter the labor market compared to males in the pooled group. As the number of children increased, individuals were less likely to enter the labor market in the pooled group. Results from the at-risk group and non at-risk group were insignificant.

The at-risk indicator variable was not significant in the earnings equation. An increase in the predicted hours worked lowered the weekly earnings for the aggregate group and the at-risk group, similar to 1993. Hispanics without PSE have higher earnings compared to Whites in the aggregate and at-risk group. Females continue to earn lower weekly wages compared to men in the aggregate and at-risk groups. Managerial and professional occupations and operators, fabricators and laborers occupations had higher

earnings than those in service occupations in the aggregate and at-risk group. None of the variables in the earnings equation for the non at-risk group were significant.

In 1993, it appears that the occupation and or industry an individual is in, is important in the determination of higher wages. By 1999, gender and race appear to be important especially for at-risk individuals.

iv. Comparison of Labor Market Outcomes of Graduates with only a Bachelor's Degree in 1999

The labor market models were re-estimated for only those individuals (1934) who were college graduates with a Bachelor's degree and the results are shown in tables 18 and 19. Few variables were significant for the at-risk group. The at-risk indicator variable in the selection equation was not significant for the aggregate group. Married individuals with a bachelor's degree were more likely to enter the labor market then single individuals for the non at-risk group and the aggregate group.

The results for the earnings equation were similar for the aggregate group and the non at-risk group. In the aggregate group earnings equation at-risk status was marginally significant at the 90% level. At-risk college graduates earned less than those individuals who were not at risk. Female graduates earned less than their male counterparts. Government employees earned less than private employees. In the occupational groups, technical, sales and administration and managerial and professional groups earned more wages than the service occupation. The workers in the financial and manufacturing industries earned more than those in the service industry.

Table 18. Labor Market Outcomes of Graduates with only a Bachelor's Degree in 1999

	Coefficient	Std. Error
Log Weekly Pay		
At Risk	-0.083*	0.044
Predicted Hours	-0.029	0.023
Work Experience	0.013***	0.002
Work Experience Squared	0.000***	0.000
Female	-0.269**	0.105
Black	-0.104	0.084
Hispanic	0.100	0.067
Other Race	-0.010	0.073
Technical, Sales, Admin	0.201**	0.092
Managerial, professional	0.259***	0.092
Precision, craft & repair	0.293	0.241
Ops, fabricators & laborers	-0.084	0.124
Other Occupation	0.195	0.286
Government Employee	-0.118***	0.042
Other Employee	0.221	0.146
Agriculture Industry	-0.032	0.160
Mining and Construction	0.127	0.096
Trans, Comm, Utilities	0.142	0.159
Wholesale and Retail Trade	-0.001	0.055
Financial Industry	0.143***	0.042
Manufacturing	0.166***	0.054
Public Industry	-0.121**	0.058
Constant	7.229***	0.904
Lambda	0.752	0.510
Selection Equation		
At Risk	0.019	0.085
Marital Status	0.240***	0.088
Number of children	0.015	0.112
Female	0.021	0.072
Single Parent	0.354	0.287
Female with Small Child	-0.200	0.211
Black	-0.146	0.147
Hispanic	0.037	0.139
Other Race	-0.041	0.121
Other Income	-0.002	0.001
Constant	1.106***	0.059
No of Observations	1934	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Table 19. Comparison of Labor Market Outcomes of Graduates with only a Bachelor's Degree in 1999

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Log Weekly Pay				
Predicted Hours	0.045	0.053	-0.019	0.016
Work Experience	0.011**	0.005	0.014***	0.002
Work Experience Squared	0.000*	0.000	0.000***	0.000
Female	0.088	0.232	-0.246***	0.077
Black	0.016	0.192	-0.065	0.076
Hispanic	0.150	0.133	0.102*	0.064
Other Race	0.096	0.241	0.039	0.056
Technical, Sales, Admin	-0.094	0.195	0.197***	0.076
Managerial, professional	-0.096	0.223	0.250***	0.070
Precision, craft & repair	-0.731	0.966	0.336	0.199
Ops, fabricators & laborers	-0.132	0.293	-0.084	0.118
Other Occupation	-0.611	0.532	0.156	0.233
Government Employee	-0.107	0.103	-0.119***	0.040
Other Employee	0.131	0.335	0.240*	0.140
Agriculture Industry	-0.026	0.349	-0.028	0.159
Mining and Construction	0.162	0.237	0.092	0.090
Trans, Comm, Utilities	-0.148	0.726	0.149	0.133
Wholesale and Retail Trade	-0.064	0.141	0.020	0.051
Financial Industry	0.196*	0.107	0.130***	0.039
Manufacturing	0.194	0.140	0.163***	0.050
Public Industry	-0.035	0.138	-0.150***	0.055
Constant	4.367**	2.032	6.982***	0.638
Lambda	0.908	1.124	0.261	0.375
Selection Equation				
Marital Status	0.040	0.176	0.310***	0.104
Number of children	0.071	0.180	-0.029	0.146
Female	0.075	0.154	0.010	0.082
Female with Small Child	-0.447	0.349	-0.070	0.274
Single Parent	0.430	0.432	0.271	0.402
Black	-0.296	0.219	-0.065	0.204
Hispanic	-0.040	0.221	0.060	0.181
Other Race	-0.320	0.217	0.067	0.148
Other Income	-0.001	0.002	-0.002	0.002
Constant	1.229***	0.132	1.082***	0.064
No of Observations	455		1479	

*** significant at 99% level ** significant at 95% level * significant at 90% level

Few factors were significant for the at-risk group. Only the work experience factor and the financial industry variable were significant in the at-risk earnings equation at 95 % and 90 % level of significance respectively. The next section decomposes the differences in earnings across groups into differences in characteristics, differences in coefficients, and selection differences.

v. Labor Market Decompositions of Earnings Differential between At-Risk and Non At-Risk Individuals

In this section the differences in the earnings between the two groups is decomposed to separate the reasons for the earnings differences according to equation (26). The first step is to compare the earnings differentials between the aggregate groups in 1993 and 1999. Then the earnings differences were compared for those individuals who had no PSE in 1993 and 1999. Finally a comparison of the earnings differences is done for those college graduates with only a Bachelor's degree in 1999. The earning differences may be due to differences in human capital characteristics, selection effect or unobservables. The difference between the average log weekly earnings was calculated for both 1993 and 1999.

For the aggregate group, the log weekly earnings difference was negative in 1993 (-0.2783) but positive in 1999 (0.1496). This is somewhat surprising as it indicates that at-risk individuals, on average, had higher earnings than those non at-risk individuals in 1993. By 1999, the earnings difference had changed in favor of non at-risk individuals. The tables 20, C10 and C11 show the results from the wage decompositions for all students in 1993 and 1999.

Table 20. Wage Decomposition for All Students

All Students	1993	1999
Observed Earnings Difference	-0.2783	0.1496
Selection Effect	0.3942	0.0558
Earnings Difference Corrected for Selection Bias	-0.6725	0.0938
Explained part	-0.2157	0.0511
Unexplained part	-0.4568	0.0427

The selectivity effect is positive in both years though it fell dramatically by 1999. After correcting for the selection effect, the earnings differential increases in 1993 but decreases in 1999. The earnings difference corrected for selection bias was -0.6725 in 1993, indicating that the average earnings offered to non at-risk individuals were at least 67% less than those for at-risk individuals. A differential of 45% is due to the advantage at-risk individuals appear to have in the labor market. Working more predicted hours on average tends to increase the wage differential in favor of at-risk individuals. If non at-risk individuals worked the same number of predicted hours as at-risk individuals the wage differential would be 56% instead of 67%.

By 1999, the earnings offer differential had changed in favor of non at-risk individuals indicating that their earnings were nine percent higher than those for at-risk individuals. A wage differential of four percent is due to the disadvantage at-risk individuals face in the labor market. Having on average, a greater work experience than non at-risk individuals reduces the wage differential for between the two groups. If at-risk individuals had the same work experience as non at-risk individuals, the wage differential would increase to 12%. The results from the earnings differential imply that

at-risk individuals are at a disadvantage in the labor market due to unobservables in the labor market. Therefore in the long run at-risk individuals face a disadvantage in the labor market.

The tables 21, C12, C13 and C14, show the wage decompositions for individuals with no PSE in 1993 and 1999 and college graduates in 1999. These wage decompositions were done in order to have comparisons across more homogeneous groups based on educational attainment. Only those individuals with similar educational experience are included in this analysis. Due to the small sample size in1999 for the non at-risk group the coefficients are less precise and thus the decomposition analysis for those without PSE is less certain. The small sample size of the at-risk group college graduates presented a similar problem.

Table 21. Wage Decompositions for Students with No PSE and College Graduates

	Students with No PSE		College Graduates
	1993	1999	1999
Observed Earnings Difference	0.0958	0.1722	0.0732
Selection Effect	-0.5666	-0.5201	-0.1428
Earnings Difference Corrected for Selection Bias	0.6624	0.6923	0.2159
Explained part	0.0102	-0.6106	-0.0582
Unexplained part	0.6522	1.3030	0.2741

For students without PSE the results show that the selectivity effect is negative in both years. This indicates that at-risk individuals with unusually high wage opportunity are at an advantage outside the labor force and are less likely to be incorporated in our sample of wage earners. After correcting for the selection effect, the earnings differential

increases for both years. The earnings difference corrected for selection bias was 0.6624 in 1993, indicating that the average earnings offered to at-risk individuals were at least 66% less than those for non at-risk individuals. A wage differential of 65% was largely due to the disadvantage at-risk individuals' face in the labor market. Eight percent of the differential is due to working less predicted hours than non at-risk individuals. If at-risk individuals were to work more hours it would eliminate the wage differential by eight percent.

By 1999, the earnings offer differential, for those without PSE, had increased slightly to 69%, in favor of non at-risk individuals, indicating that their earnings were 69% higher than those for at-risk individuals. If at-risk individuals worked the same number of predicted hours as non at-risk individuals the wage differential would be much larger. The lower wages received by females with no PSE accounts for 14% of the wage differential.

The observed earnings differential for college graduates is seven percent. The selectivity effect is negative for college graduates in 1999. After correcting for the selection effect, the earnings differential increases to 22 %. This indicates that the average earnings offered to at-risk individuals were at least 22% less than those for non at-risk individuals. At-risk individuals faced a wage differential of 27% due to disadvantage in the labor market. The skills difference (five percent) in favor of at-risk individuals actually lowered the earnings differential. This is largely attributed to the predicted hours and work experience which tend to lower the wage differential. If at-risk individuals worked the same predicted hours and had the same work experience, the

earnings differential would be much higher, 33%. Comparing college graduates in 1999 with those individuals with no PSE in 1999, one finds that the earnings differential between at-risk and non at-risk individuals was much smaller for college graduates. This indicates that at-risk individuals continue to be disadvantaged despite in creasing their educational attainment.

C. Summary and Conclusions

Five eighth grade factors were shown to be influential in increasing the risk of dropping out of high school. These factors are coming from a low-income family, having a sibling who dropped out, having parents with low education, being home alone after school for 3 hours or more, or coming from a step-family. Students were separated into at-risk or non at-risk status based on these five factors, which formed an indicator variable.

At-risk students were found to be less likely than non at-risk students to graduate from high school. Factors that may increase the likelihood of graduation include improving urban schools, higher levels of parental education, race and family structure. Some factors that have been used in previous studies were left out of this analysis due to the potential problem of endogeneity. These factors include ever held back, attending a Catholic or private school, curriculum, and taking a college entrance exam. There was insufficient data or information to instrument for these variables. Leaving out these variables implies that the results may suffer from specification bias.

Initial PSE results suggest that at-risk students may be constrained in their PSE choices. They are more likely to select just some PSE rather than a bachelor's degree. The results also indicate females, Blacks, Hispanics, and other races are more likely to select higher levels of PSE. Having a father with a college degree increased the likelihood of an individual going to college, indicating the importance of promoting college education given its intergenerational benefits. When the PSE choices are adjusted for individual family, and school characteristics, the choices at-risk individuals make more closely resemble those of non at-risk individuals. This indicates that there may be human capital endowments that place at-risk students at a disadvantage in their selection of PSE.

A number of important variables were left out of the labor market analysis. These include the curriculum, taking a college entrance exam, and neighborhood variables. Neighborhood variables are only available for 1999. Including them in the analysis makes comparison across years difficult as there is no neighborhood variable information available for 1993. Therefore they were left out of the analysis.

The previous analysis has shown that at-risk individuals do face some level of disadvantage in the labor market. This disadvantage though, is not uniform. As a whole group, at-risk individuals appeared to be better off in the labor market in 1993, but by 1999 they were at a disadvantage. They were facing lower wage offers than individuals in the non at-risk group. Comparing only those without PSE, shows that at-risk individuals were actually at a disadvantage in 1993. At-risk college graduates were also

at a disadvantage compared to non at-risk college graduates, but their earnings differential was much smaller.

The wage decompositions indicate that at-risk individuals are at a disadvantage in the labor market and this disadvantage increases overtime. There appear to be some unobservables in the labor market that places an at-risk individual at a disadvantage. Differences in human capital characteristics account for a small part of the wage differential between at-risk and non at-risk individuals. Comparison of similarly educated individuals with no PSE and those with just a Bachelor's degree shows that at-risk individuals were at a disadvantage in the labor market. As there is no visible basis for any discrimination on the part of the employer due to at-risk status, this may indicate that there is no signal put out by the individuals in the labor market. Though the employer may discriminate against at-risk individuals based on correlated factors, this analysis provides some support for the human capital theory and not the signaling theory.

The academic and labor market outcomes indicate that at-risk individuals are at a disadvantage when compared to non at-risk individuals. This disadvantage may be addressed through policies or programs aimed at assisting the individual in high school and in his or her PSE choices and ultimately in the labor market. The following chapter addresses some of these issues.

CHAPTER V

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

The objective of improving academic outcomes has always been an important federal government policy issue as evidenced by the various policy statements from time to time including the No Child Left Behind act (NCLB). This act raises accountability standards for states and local agencies. Different academic outcomes are listed for achievement in the act. An important and noticeable outcome is improving the academic achievement of the disadvantaged. This includes prevention and intervention programs for at-risk children and youth, and school dropout prevention. The NCLB act and previous ones raise an important question as to how do policy makers identify the target population. Various terms are used to identify the target population in the NCLB act. These include, at-risk, disadvantaged, or underachievers. Different characteristics are used to identify the groups.

This study has established a set of characteristics that may be used to identify an individual who would then be regarded as at-risk for dropping out of high school. These socio-economic characteristics are based on factors existing while the student was in the eighth grade. The aim here was to separate high school factors from pre-existing ones. Identification of these factors will also help in policy planning and enable policy makers make the necessary changes required to ensure high school success. The factors

identified in this study as having the most impact on dropping out are having a parent with a low education level, having a sibling who has dropped out of school, being home alone for more than 3 hours, having parents with low income, and coming from a step family. Based on these factors a student was identified as being at-risk to dropping out of high school if he or she had any one or more of the identified factors.

This study has shown that at-risk status affects high school completion, PSE choices and has an effect in the labor force, especially in the long-term. At-risk students are at a disadvantage when compared to non at-risk students. This apparent disadvantage does not disappear with high school completion or when the individual enters the labor market but affects PSE undertakings and long-term earnings. The question that arises now is how to design and/or implement programs that will positively influence academic and labor market outcomes. While one may not be able to change the conditions that put this student at risk, programs may be implemented that mitigate the impact of being in at-risk status.

Policymakers may wish to construct programs that address these issues in order to lower the dropout rate and assist at-risk individuals. The programs may focus on addressing those factors that place an individual at-risk. These may include early intervention programs to identify at-risk students. Programs addressing these risk factors may be an initial step in assisting at-risk students. These programs may include mentoring, tutoring, counseling, and after school academic and recreational programs. To encourage student participation, schools may wish to provide transportation for their after school programs.

There is support for increasing after school programs as they lower the amount of time an at-risk student is at home alone. These may be recreational or educational, school based or non school based. There already exist dropout prevention programs that include an after school component. These programs may be expanded to include all students. This is important in terms of equity and to avoid stigmatizing at-risk students. The programs may also include the provision of educational support to parents. While we may not succeed in raising parental education levels, ensuring children's educational success will positively impact the next generation's outcomes given the generational effect of education. Schargel and Smink (2001) outline strategies that may assist in improving educational outcomes.

The results presented in this study suggest that there may be a role for a universal family allowance in reducing the prevalence of at-risk designation. The current child tax credit and earned income tax credit provide some relief for families with children. Not all families though are able to take advantage of these credits. Lindsey (2004) argues for a universal family allowance rather than the current welfare system which has some stigma attached to it. Children allowance programs are already found in a number of Western European countries and Canada.

This study found that math test scores are important for high school completion and PSE selection. The results support the requirement by the federal government that states and schools raise math scores among other scores. Students with higher math scores are more likely to complete high school and go on to obtain a bachelor's degree.

Programs to raise test scores may prove beneficial to students. These may include tutoring and be linked with other after school programs.

In order to increase the likelihood that an individual selects to go to college, academic advisement and a mentoring program to encourage college attendance may be advantageous to all students. An out-reach program encouraging and assisting at-risk students to continue with PSE may need to be implemented. Having a father with a college degree increased the likelihood of an at-risk individual graduating from high school and also going to college. This signifies the importance of promoting college education given its intergenerational benefits.

Family structure is also an important consideration. Parental marital status has an impact on PSE choices. Individuals from a traditional family structure were more likely to select a Bachelor's degree. This may allude to the harmful effect of the dissolution of the traditional family structure. While we cannot interfere with family structure, we may be able to mitigate the harmful effects of family dissolution. This may be through the provision of counseling and financial assistance to the individuals. Thus schools may wish to emphasize a college track curriculum, focus on raising test scores, counseling and increased access to financial aid.

An important neighborhood variable in this study was the school location. Students in suburban and rural schools were more likely to graduate then those in urban schools. Other factors include the average neighborhood income and the percent unemployed in the neighborhood. This indicates that individuals residing in

impoverished neighborhoods may need additional resources to overcome the negative effects of their neighborhood.

The NCLB act allows for dropout prevention programs that focus on the school and classroom. While these are important areas, policy makers may wish to expand them to include counseling and mentoring programs for at-risk students. The Comprehensive School Reform Program allows for local initiatives to enable all children to meet higher educational standards. Programs that are already in existence and may help students include the YMCA after-school programs, the Boys and Girls Clubs, Big Brothers/ Big Sisters and others that are more localized. Other programs that have been implemented include the Coca-Cola Valued Youth Program, Voyager Expanded Learning and Hands On Science Outreach (Schargel and Smink 2001). These programs provide services that may include mentoring, tutoring, and academic or recreational after-school programs.

In the labor market there appear to be mixed signals. Right after high school graduation, at-risk students appear to have an advantage and earn higher weekly earnings. Six years after graduation at-risk students have lower average weekly earnings. Wage decompositions comparing individuals with the same level of education show that at-risk individuals are at a disadvantage in the labor market and this disadvantage increases overtime. At-risk individuals without any PSE received average wages that were at least 66% lower than non at-risk individuals. College graduates in the at-risk group were also at a disadvantage when compared to non at-risk individuals, as their average wages were 21% lower. This shows that at-risk status has a long-term impact in the labor market, which is evidenced by the lower earnings at-risk individuals receive. This suggests that a

policy of encouraging PSE attendance may help reduce any long-term disadvantage at-risk individuals face in the labor market. This will lessen the long-term human capital impact of at-risk status as the wage differential between college graduates is smaller than that between those without PSE. Additional policies will be necessary to lessen the wage differential between college graduates and ultimately the long-tern impact of at-risk status.

At-risk status is shown in this study to place individuals at a disadvantage compared to non at-risk individuals. At-risk status is a continuous process that affects individuals not only in high school, but also in their post secondary schooling choices. This disadvantage continues into the labor market and appears to be long-term despite efforts to increase the educational attainment of at-risk individuals. What this indicates is that there are human capital traits that may be linked to these at-risk indicators that place an individual at a disadvantage. Efforts to address these risk factors may help mitigate the effects of at-risk status.

This study has identified those factors that put an individual at-risk for dropping out of high school. It has also identified factors that may assist policy makers in designing a program of assistance for at-risk students. This study did not look at the interaction of the different factors that make up the indicator variable, and whether having more than one factor was more detrimental to a student. The study did not attempt to identify which characteristics had a greater impact on an individual. The question of transitory risk factors was not addressed nor the effect of unexpected events. Further research may wish to address these issues.

One may wish to look at the labor market outcomes using more detailed panel data. This may help in the identification and better understanding of when the advantages the at-risk group enjoy in the labor market begin to change to disadvantages. Also, a longer panel for labor market outcomes may help us understand whether the at-risk group continues to be at a disadvantage or if there is any reversal.

APPENDIX A

Supplement to Chapter II

Table A1. Summary of Related Studies

Study	Data	Methodology	Outcome of Interest	Factors Affecting Outcome
Ainley, Foreman and Sheret (1992)	New South Wales, Australia government high school students	Multiple regressions	School completion beyond compulsory years	Student background characteristics and school factors
Alwin & Thornton (1984)	White family sample from Detroit, Michigan	Structural equation model	School achievement outcomes	Parental education, occupation, economic level, family size
Angrist and Krueger (1991)	Three decennial Censuses	2 Stage Least Squares	educational attainment and earnings	Season of birth, compulsory schooling laws
Astone and McLanahan (1994)	High School and Beyond Study	Multinomial logit and single-equation logistic regression model	Residential mobility and high school achievement,	Dropout status, family structure, family socioeconomic status, residential mobility
Astone and McLanahan (1991)	High School and Beyond Study	OLS and Probit	educational aspirations, attendance, attitude toward school, grades, never dropped out, and high school completion/GED	Parenting practices, family structure
Boggess (1998)	Panel Study of Income Dynamics	Logistic regression models	high school graduation	Family structure and economic status
Brooks-Gunn, Duncan et al. (1993)	the Infant Health and Development Program and the Panel Study of Income Dynamics	Logistic regression	Developmental outcomes including dropping out of high school	Neighborhood conditions, family-level measures

Table A1. – Continued

Study	Data	Methodology	Outcome of Interest	Factors Affecting Outcome
Cameron and Heckman (2001)	NLSY	Multinomial logit	Educational attainment	Family income, college tuition costs, labor market opportunities, cognitive ability
Cameron and Heckman (1994)	NLSY men	Probit	High school dropout, graduation and GED certification	Family income and structure, parents' education, labor market opportunities
Case and Katz (1991)	1989 NBER survey of youth from low-income Boston neighborhoods	Multivariate and probit models	Labor force status, criminal activity, and church attendance.	Neighborhood and family
Clark-Kauffman, Duncan and Morris (2003)	14 different welfare and work programs	Ordinary least squares	School achievement, earnings and family income	Welfare reform strategies
Crawford, Johnson and Summers (1997)	High School and Beyond data	Linear regression model	Earnings	School characteristics
Datcher (1982)	the University of Michigan Panel Study of Income Dynamics		Education and earnings	Parents' education, family income, number of siblings, size of place and region of origin percentage white in the neighborhood and average neighborhood income
Dearden, Ferri and Meghir (2002)	British National Child Development Survey	Ordered probit	Educational attainment and wages	Type of school and teacher-pupil ratio

Table A1. – Continued

Study	Data	Methodology	Outcome of Interest	Factors Affecting Outcome
DesJardins, Ahlburg and McCall (1999)	University of Minnesota New High School students	Duration models	College stopout and dropout	
Duncan (1994)	Panel Study of Income Dynamics		School outcomes	Family and neighborhood characteristics
Ekstrom et al. (1986		Path analysis	High school dropout	Behavioral problems, poor grades, family and demographic variables
Ermisch and Marco (2001)	British Household Panel Survey data	Logit	Educational attainment, economic inactivity, early childbearing, distress and smoking	Family structure
Ensminger and Slusarcick (1992)			Poor academic performance	Individual characteristics Parent educational level and involvement in school activities
Evans and Schwab (1995)	High School and Beyond data	Bivariate probit	Graduation, starting college	Catholic school, family structure, parents' education, higher incomes, gender, and age
Garasky (1995)	NLSY	Probit	Educational attainment	Family structure, mother's education
Gennetian et al. (2004)	16 welfare or employment programs	Meta-analysis	Adolescent schooling	Siblings, maternal employment

Table A1. – Continued

Study	Data	Methodology	Outcome of Interest	Factors Affecting Outcome
Ginther (2000)		Probit, OLS	Graduation, years of schooling, teen non-marital childbearing	
Haveman, Wilson and Wolfe (1998)	Panel Study of Income Dynamics, U.S. Census	Probit and tobit	Educational attainment	Gender, race, family structure, parents education, mobility, neighborhood factors
Hearn (1991)	High School and Beyond data, Higher Education Research Institute	Multiple regression	College destinations	Test scores, high-school grades, academic track, extra curricular activities, educational aspirations, socio-economic
Hill (1979)	NLSY young men	System of equations	Dropping out	Parent's education, number of siblings, IQ scores, labor market knowledge, the state of the labor market, high school curriculum
Jordan, Lara and McPartland (1996)	National Education Longitudinal Study of 1988	Multiple regression	Dropping out	Family-related reasons, school-related reasons, work-related reasons, safety concerns, suspensions, mobility and peer influences

Table A1. – Continued

Study	Data	Methodology	Outcome of Interest	Factors Affecting Outcome
McNeal (1997)	Sophomore component of High School and Beyond data	Logistic regression	Dropping out	Employment intensity and job type
Olsen and Farkas (1988)	Youth Incentive Entitlements Pilot Project	Duration models	Dropping out and childbearing	Labor market opportunities, family background and childbearing
Ribar (1994)	NLSY women	Bivariate probit model	Dropping out, teen pregnancy	Welfare payments, siblings, family, unemployment rate, religion, school funding, mother's education
Rivkin (1995)	High School and Beyond data, U.S. Census, FBI Crime Statistics	Multinomial logit	Educational attainment and employment	Academic preparation, labor market opportunities and nonmarket income alternatives
Rumberger et al. (1990)	surveys done in 1985 of schools and families in California	Bivariate Equations		The family unit
Rumberger and Larson (1998)	NELS:88	Recursive models	High school dropout	Demographic, family and school factors

Table A1. – Continued

Study	Data	Methodology	Outcome of Interest	Factors Affecting Outcome
Sandefur, McLanahan and Wojtkiewicz (1992)	the National Longitudinal Survey of Youth	Probit	Receiving a high school diploma, GED, college attendance	Family structure, changes in family structure, individual characteristics,
Teachman et al. (1997)	NLSY	Bivariate models	Educational attainment	Poverty during adolescence, neighborhoods and schools
Tienda and Ahituv (1996)	NLSY	Multivariate analysis	School enrollment	Employment
Vartanian (1999)	Panel Study of Income Dynamics, U.S. Census	OLS, 2-stage selection, tobit	Labor market and economic outcomes	Neighborhood and family conditions
Vartanian and Gleason (1999)	Panel Study of Income Dynamics, U.S. Census	Logistic regression	High school dropout, college graduation	Neighborhood conditions
Velez (1989)	High School and Beyond data	Logit model	High school dropout	Confrontational factors, family characteristics, SES, demographic factors
Wilson (2001)	Panel Study of Income Dynamics, Census, Common Core data	Tobit and probit	Educational attainment	Poverty during adolescence, neighborhood characteristics and schools

APPENDIX B

Supplement to Chapter III

Figure 1. Potential Academic Outcomes for High School Students

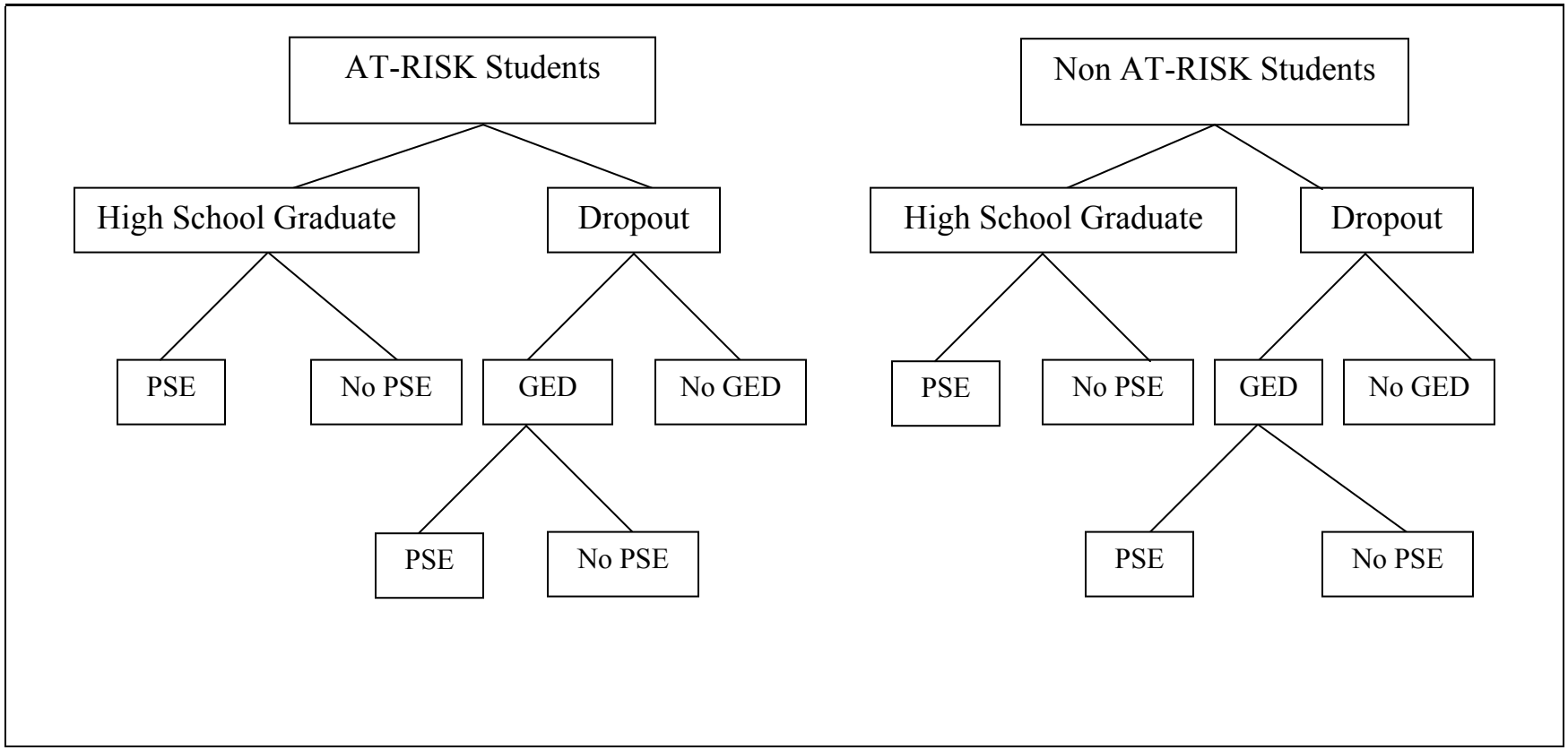

Table B1. Definition of Variables

	Risk status	These indicators were identified from the Base year questionnaire when the individual was in the eighth grade
ATRISK1	Single Parent Family	Student comes from a single parent family
ATRISK2	Low Parent Ed.	1 if neither parent finished high school, 0 if otherwise
ATRISK3	Sibling Dropout	1 if one or more siblings dropped out of high school, 0 if otherwise
ATRISK4	Home Alone	1 if the individual spent 3 or more hours at home after school without adult supervision
ATRISK5	Limited English	1 if the individual has limited English proficiency, 0 if otherwise
ATRISK6	Low Family Income	1 if the individual's family income was less than $15,000 in 1987
ATRISK	At-Risk Status	1 if identified as At-Risk, 0 otherwise
	Demographic Variables	
FEMALE	Female	1 if Female, 0 if otherwise
WHITE	White	1 if White, 0 if otherwise
HISPANIC	Hispanic	1 if Hispanic, 0 if otherwise
BLACK	Black	1 if African-American, 0 if otherwise
RACEOTH	Other Race	1 if Asian or Pacific Islander, American Indian or Alaska Native, 0 if otherwise
OLDSIBS	Older Siblings	Number of older siblings
TFAM	Traditional Family	1 if from a traditional family, 0 if otherwise
SFAM	Step Family	1 if from a step family, 0 if otherwise
MFAM	Mother Only Family	1 if from a mother only family, 0 if otherwise
OTHFAM	Other Family	1 if from other family structure, 0 if otherwise
FEDLHS	Father's education-less than high school	1 if education in 1988 is less than high school, 0 otherwise
FEDHSG	Father's education -high school	1 if has high school education in 1988, 0 otherwise

Table B1. – Continued

FEDCG	Father's education – college	1 if college graduate in 1988, 0 otherwise
FEDOTH	Father's education –other	1 if has other educational level in 1988, 0 otherwise
MEDLHS	Mother's education-less than high school	1 if education in 1988 is less than high school, 0 otherwise
MEDHSG	Mother's education -high school	1 if has high school education in 1988, 0 otherwise
MEDCG	Mother's education – college	1 if college graduate in 1988, 0 otherwise
MEDOTH	Mother's education - other	1 if has other educational level in 1988, 0 otherwise
MWORK8	Mother Works	1 if mother is employed, 0 if otherwise
FWORK8	Father Works	1 if father is employed, 0 if otherwise
FSIZE8	Family Size in 1988	Individual's estimated family size during the Base year
FSIZE12	Family Size in 1992	Individual's estimated family size during the second follow-up
MAR	Marital Status	1 if Married, 0 if otherwise
SPARENT	Single Parent	1 if Single Parent, 0 if otherwise
INC1535	Family income $15000-<$35000	1 if the Family income in 1987 is $15000-<$35000, 0 otherwise
INC3550	Family income $35000-<$50000	1 if the Family income in 1987 is $35000-<$50000, 0 otherwise
INC50100	Family income $50000-<$100000	1 if the Family income in 1987 is $50000-<$100000, 0 otherwise
INC100	Family income >$100000	if the Family income in 1987 is >$100000, 0 otherwise
	School Variables	
READSC	Reading Scores	Reading test scores
MATHSC	Math Scores	Math test scores
RATIO8	Student–Teacher Ratio	Student-Teacher Ratio in individual's school
LUNCH8	% School Lunch	% eligible for free lunch in school
GRADS	Graduate	1 if the individual completed high school, 0 if otherwise

Table B1. – Continued

	Post-Secondary Education Variables	
NOPSE	No PSE	1 if no PSE, 0 if otherwise
SOMEPSE	Some PSE	1 if some PSE, 0 if otherwise
CERT/ASSOC	Certificate or Associate Degree	1 if has a certificate or Associate degree, 0 if otherwise
BACH	Bachelor Degree	1 if has a Bachelor degree, 0 if otherwise
POSTGRAD	Post Graduate Degree	1 if has a post graduate degree, 0 if otherwise
	Labor Market Variables	
EMP	Employed	1 if employed, 0 if otherwise
TSADM	Technical, Sales, Admin	1 if tech, sales, admin occupation, 0 if otherwise
MPROF	Managerial, professional	1 if managerial, professional occupation, 0 if otherwise
SERVICE	Service	1 if service occupation, 0 if otherwise
CRAFT	Precision, craft & repair	1 if precision, craft & repair occupation, 0 if otherwise
LAB	Operators, fabricators & laborers	1 if operators, fabricators & laborers occupation, 0 if otherwise
OTHOCC	Other Occupation	1 if other occupation, 0 if otherwise
AGIND	Agriculture Industry	1 if in Agriculture Industry, 0 if otherwise
MCIND	Mining and Construction	1 if in Mining and Construction, 0 if otherwise
MAIND	Manufacturing	1 if in Manufacturing, 0 if otherwise
TCUIND	Transportation, Communication, Utilities	1 if in Transportation, Communication, Utilities, 0 if otherwise
TRDIND	Wholesale and Retail Trade	1 if in Wholesale and Retail Trade, 0 if otherwise
FININD	Financial Industry	1 if in Financial Industry, 0 if otherwise
SERVIND	Service Industry	1 if in Service Industry, 0 if otherwise
PUBIND	Public Industry	1 if in Public Industry, 0 if otherwise

Table B1. – Continued

UNEMPRATE	Unemployment Rate	Unemployment Rate in MSA or State
EARN	Earnings rate	Earnings rate in MSA or State
	Neighborhood Variables	
URBAN	Urban location	1 if Urban location, 0 if otherwise
SUBURB	Suburban location	1 if Suburban location, 0 if otherwise
RURAL	Rural location	1 if Rural location, 0 if otherwise
NEAST	Northeast Region	1 if Northeast, 0 if otherwise
WEST	West Region	1 if West, 0 if otherwise
SOUTH	South Region	1 if South, 0 if otherwise
MWEST	Midwest Region	1 if Midwest, 0 if otherwise
PWHITE	%White	% White in neighborhood
PBLACK	%African-Americans	% African-Americans in neighborhood
PASST	% on Assistance	% on public assistance in neighborhood
PUNEMP	% Unemployed	% unemployed in neighborhood
AVINC	Average income	Average income in neighborhood
PLOWED	%lowed	% low education in neighborhood
PLAB1	% tech, sales, admin	% technical, sales, admin occupation, 16+
PLAB2	% managerial, professional	% managerial, professional occupation, 16+
PLAB3	% service	% service occupation, 16+
PLAB4	% precision, craft & repair	% precision, craft & repair occupation, 16+
PLAB5	% operators, fabricators & laborers	% operators, fabricators & laborers occupation, 16+

Table B2. Descriptive Statistics

Variable Description	Mean	Std. Dev.	Min	Max	Obs
High School Graduate	0.8968	0.3042	0	1	9364
At-Risk	0.4191	0.4934	0	1	9364
Single parent family	0.1589	0.3656	0	1	9364
Low parent education	0.0976	0.2968	0	1	9364
Sibling dropout	0.0868	0.2816	0	1	9364
Home alone 3 or more hours	0.1228	0.3282	0	1	9364
Limited English proficiency	0.0213	0.1442	0	1	9364
Low family income <$15000	0.1787	0.3831	0	1	9364
Family income $15000-<$35000	0.3723	0.4834	0	1	9364
Family income $35000-<$50000	0.2147	0.4106	0	1	9364
Family income $50000-<$100000	0.1817	0.3856	0	1	9364
Family income >$100000	0.0528	0.2236	0	1	9364
Female	0.5337	0.4989	0	1	9364
White	0.7195	0.4493	0	1	9364
Black	0.0865	0.2811	0	1	9364
Hispanic	0.1243	0.3299	0	1	9364
Other race	0.0697	0.2547	0	1	9364
Have older siblings	1.2592	1.4722	0	6	9289
Family size - 8th grade	4.6098	1.3745	2	11	9364
Family size - 12th grade	4.2600	1.4299	1	10	8278
Father's education - less than high school	0.1703	0.3759	0	1	9364
Father's education -high school	0.2916	0.4545	0	1	9364
Father's education - college	0.2840	0.4509	0	1	9364
Father's education - other	0.2046	0.4034	0	1	9364
Mother's education - less than high school	0.1660	0.3721	0	1	9364
Mother's education - high school	0.3510	0.4773	0	1	9364
Mother's education - college	0.2381	0.4260	0	1	9364
Mother's education - other	0.2362	0.4248	0	1	9364
Mother works - 8th grade	0.8888	0.3144	0	1	9364
Father works - 8th grade	0.8809	0.3239	0	1	9364
Mother works - 12th grade	0.8888	0.3144	0	1	9364
Father works - 12th grade	0.8809	0.3239	0	1	9364
Urban location - 8th grade	0.2427	0.4288	0	1	9364
Suburban location - 8th grade	0.4301	0.4951	0	1	9364
Rural location - 8th grade	0.3272	0.4692	0	1	9364
Urban location - 12th grade	0.2588	0.4380	0	1	9364

Table B2. – Continued

Variable Description	Mean	Std. Dev.	Min	Max	Obs
Suburban location - 12th grade	0.3952	0.4889	0	1	9364
Rural location - 12th grade	0.3222	0.4673	0	1	9364
North East location - 8th grade	0.1747	0.3797	0	1	9364
North Central location – 8th grade	0.2879	0.4528	0	1	9364
South location – 8th grade	0.3472	0.4761	0	1	9364
West location - 8th grade	0.1902	0.3925	0	1	9364
North East location - 12th grade	0.1709	0.3764	0	1	9364
Midwest location - 12th grade	0.2832	0.4506	0	1	9364
South location - 12thgrade	0.3370	0.4727	0	1	9364
West location - 12thgrade	0.1855	0.3887	0	1	9364
Traditional family - 8th grade	0.7089	0.4543	0	1	9364
Step family - 8th grade	0.1112	0.3144	0	1	9364
Mother only family - 8th grade	0.1373	0.3442	0	1	9364
Other family - 8th grade	0.0426	0.2020	0	1	9364
Traditional family - 10th grade	0.6518	0.4764	0	1	9364
Step family - 10th grade	0.1044	0.3059	0	1	9364
Mother only family - 10th grade	0.0077	0.0874	0	1	9364
Other family - 10th grade	0.1463	0.3534	0	1	9364
Traditional family - 12th grade	0.5813	0.4934	0	1	9364
Step family - 12th grade	0.1102	0.3132	0	1	9364
Mother only family - 12th grade	0.0091	0.0948	0	1	9364
Other family - 12th grade	0.1634	0.3697	0	1	9364
Reading scores - 8th grade	51.6784	10.0489	31.92	70.55	9364
Math scores - 8th grade	51.8676	10.2303	34.24	77.20	9364
Reading scores - 10th grade	51.5669	9.8253	30.60	68.91	8915
Math scores - 10th grade	51.8086	9.9983	31.66	71.93	8908
% School lunch- 8th grade	22.1341	22.1684	0	100	9364
Student-teacher ratio - 8th grade	17.6162	4.9456	6	50	9364
Mother: tech, sales, admin - 8th grade	0.1641	0.3704	0	1	9364
Mother: managerial, professional - 8th grade	0.2683	0.4431	0	1	9364
Mother: service - 8th grade	0.2089	0.4065	0	1	9364
Mother: precision, craft & repair - 8th grade	0.0209	0.1432	0	1	9364
Mother: ops, fabricators & laborers - 8th grade	0.0917	0.2887	0	1	9364
Mother: other occupation - 8th grade	0.2357	0.4245	0	1	9364

Table B2. -- Continued

Variable Description	Mean	Std. Dev.	Min	Max	Obs
Father: tech, sales, admin - 8th grade	0.2257	0.4180	0	1	9364
Father: managerial, professional - 8th grade	0.1325	0.3391	0	1	9364
Father: service - 8th grade	0.0612	0.2397	0	1	9364
Father: precision, craft & repair - 8th grade	0.1447	0.3518	0	1	9364
Father: ops, fabricators & laborers - 8th grade	0.2656	0.4417	0	1	9364
Father: other occupation - 8th grade	0.1333	0.3399	0	1	9364
Mother: tech, sales, admin - 12th grade	0.1641	0.3704	0	1	9364
Mother: managerial, professional - 12th grade	0.2683	0.4431	0	1	9364
Mother: service - 12th grade	0.2089	0.4065	0	1	9364
Mother: precision, craft & repair - 12th grade	0.0209	0.1432	0	1	9364
Mother: ops, fabricators & laborers - 12th grade	0.0917	0.2887	0	1	9364
Mother: other occupation - 12th grade	0.2391	0.4266	0	1	9364
Father: tech, sales, admin - 12th grade	0.2257	0.4180	0	1	9364
Father: managerial, professional - 12th grade	0.1325	0.3391	0	1	9364
Father: service - 12th grade	0.0612	0.2397	0	1	9364
Father: precision, craft & repair - 12th grade	0.1447	0.3518	0	1	9364
Father: ops, fabricators & laborers - 12th grade	0.2656	0.4417	0	1	9364
Father: other occupation - 12th grade	0.1373	0.3442	0	1	9364
% White in neighborhood - 1990	76.4434	28.1648	0	100	9364
% African-American in neighborhood - 1990	9.0694	17.0679	0	99.39	9364
% public assistance in neighborhood - 1990	7.3984	5.8609	0	49.97	9364

Table B2. -- Continued

Variable Description	Mean	Std. Dev.	Min	Max	Obs
% unemployed in neighborhood - 1990	0.4805	0.3107	0	5.45	9364
Average income in neighborhood - 1990	37.1363	17.4956	0	206.69	9364
% low education in neighborhood - 1990	15.5965	8.1502	0	66.51	9364
% tech, sales, admin - 1990	11.4682	6.2803	0	45.17	9364
% managerial, professional - 1990	13.9801	4.8030	0	33.12	9364
% service – 1990	5.8304	1.8803	0	16.81	9364
% precision, craft & repair - 1990	5.3135	2.0366	0	15.35	9364
% operators, fabricators & laborers - 1990	7.1780	3.5141	0	25.07	9364
Some PSE	0.2956	0.4563	0	1	9364
Certificate/Associate degree	0.1485	0.3557	0	1	9364
Bachelor's degree	0.3150	0.4646	0	1	9364
Post graduate degree	0.0413	0.1991	0	1	9364
No PSE	0.1899	0.3922	0	1	9364

APPENDIX C

Supplement to Chapter IV

Table C1. Descriptive Statistics for the Labor Market

Variable	1993		1999	
	Mean	Std. Dev.	Mean	Std. Dev.
At-Risk	0.3660	0.4818	0.3702	0.4829
Female	0.4919	0.5000	0.5116	0.4999
White	0.7443	0.4363	0.7377	0.4399
Black	0.0759	0.2649	0.0767	0.2661
Hispanic	0.1116	0.3149	0.1186	0.3234
Other Race	0.0681	0.2520	0.0670	0.2501
Marital Status	0.0714	0.2575	0.4100	0.4919
Single Parent	0.3011	0.4588	0.0919	0.2889
Number of children	0.0840	0.3116	0.4320	0.7683
Small Child	0.0620	0.2411	0.2158	0.4114
Female with Small Child	0.0454	0.2083	0.1167	0.3211
Other Income (thousands)	2.2660	5.5876	15.5018	23.8133
No PSE	0.2450	0.4301	0.1334	0.3401
Student	0.6171	0.4862	0.1991	0.3994
Technical, Sales, Admin	0.1616	0.3681	0.1868	0.3898
Managerial, professional	0.0513	0.2206	0.4991	0.5000
Service	0.0737	0.2612	0.1234	0.3289
Precision, craft & repair	0.0380	0.1911	0.0290	0.1679
Ops, fabricators & laborers	0.0733	0.2607	0.0997	0.2996
Other Occupation	0.0295	0.1693	0.0180	0.1331
Agriculture Industry	0.0120	0.1089	0.0135	0.1153
Mining and Construction	0.0165	0.1276	0.0511	0.2201
Trans, Comm, Utilities	0.0120	0.1089	0.0142	0.1185
Manufacturing	0.0587	0.2352	0.1135	0.3173
Wholesale and Retail Trade	0.1700	0.3757	0.1348	0.3415
Financial Industry	0.0412	0.1988	0.1336	0.3403
Service Industry	0.0681	0.2520	0.2644	0.4411
Public Industry	0.0493	0.2166	0.0685	0.2527

Table C1. -- Continued

Variable	1993		1999	
	Mean	Std. Dev.	Mean	Std. Dev.
Private Employee	0.3527	0.4779	0.7836	0.4118
Government Employee	0.0675	0.2509	0.1139	0.3177
Other Employee	0.0052	0.0719	0.0251	0.1563
Work Experience	4.4760	5.7171	17.7227	23.2184
Work Experience Squared	52.7096	217.1393	853.0830	1870.4810
Log Weekly Pay	4.3420	1.0421	6.2505	0.6132
Predicted Hours	36.4750	6.3434	42.3943	3.9517
No of Observations.	3092		5268	

Table C2. Hours Worked by All Students

	1993		1999	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
At-Risk	0.254	0.449	-0.112	0.307
Female	-3.098***	0.431	-5.034***	0.277
Black	0.533	1.095	0.579	0.499
Hispanic	-0.940	0.728	-0.229	0.415
Small Child	4.119***	1.307	-0.363	0.517
Other Race	-0.404	1.488	-1.680***	0.315
Other Income	-0.016	0.043	-0.004	0.006
Student	-2.296***	0.605	-6.048***	0.338
Technical, Sales, Admin	5.186***	0.547	0.553	0.413
Managerial, professional	9.736***	0.879	2.710***	0.351
Precision, craft & repair	10.869***	1.126	1.156	0.799
Operators, fabricators & laborers	9.794***	0.737	1.326***	0.498
Other Occupation	22.486***	1.277	8.717***	1.027
Constant	36.064***	0.933	44.741***	1.229
Lambda	-15.522***	5.095	-5.770	5.632
Selection Equation				
At-Risk	-0.045	0.043	-0.078*	0.040
Marital Status	0.055	0.089	0.204***	0.050
Number of children	-0.072	0.104	-0.069**	0.029
Female	0.008	0.042	0.015	0.041
Single Parent	0.156***	0.051	0.120	0.078
Female with Small Child	-0.715***	0.141	0.001	0.068
Student	-0.212***	0.045	0.089*	0.047
Black	-0.387***	0.068	0.013	0.073
Hispanic	-0.151**	0.064	0.021	0.061
Other Race	-0.595***	0.067	-0.022	0.074
Other Income	-0.008**	0.003	-0.001	0.001
Constant	1.370***	0.049	1.199***	0.038

Table C3. Hours Worked by All Students in 1993

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
Female	-3.550***	0.576	-2.868***	0.546
Black	0.145	1.206	-0.630	1.615
Hispanic	-0.746	0.861	-1.697*	1.031
Other Race	-2.488	1.887	-1.036	1.856
Small Child	3.649**	1.612	2.332	1.753
Student	-3.116***	0.697	-2.322***	0.820
Other Income	-0.025	0.075	-0.036	0.048
Technical, Sales, Admin	4.954***	0.710	5.380***	0.784
Managerial, professional	10.178***	1.120	9.574***	1.262
Precision, craft & repair	12.775***	1.377	9.091***	1.653
Operators, fabricators & laborers	9.853***	0.900	9.924***	1.096
Other Occupation	20.457***	1.764	23.699***	1.717
Constant	35.527***	1.225	35.288***	1.129
Lambda	-9.235	6.241	-11.678*	6.287
Selection Equation				
Marital Status	0.031	0.115	0.084	0.142
Number of children	-0.028	0.127	-0.112	0.185
Female	0.058	0.069	-0.024	0.052
Female with Small Child	-0.720***	0.180	-0.727***	0.234
Single Parent	0.029	0.075	0.268***	0.072
Student	-0.152**	0.068	-0.258***	0.061
Black	-0.349***	0.094	-0.444***	0.101
Hispanic	-0.201**	0.087	-0.087	0.098
Other Race	-0.608***	0.112	-0.586***	0.083
Other Income	-0.016**	0.007	-0.006	0.004
Constant	1.337***	0.074	1.391***	0.062

Table C4. Hours Worked by All Students in 1999

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
Female	-5.122***	0.459	-4.985***	0.347
Black	0.410	0.640	0.942	0.781
Hispanic	0.146	0.556	-0.651	0.638
Other Race	-0.421	0.861	-0.363	0.639
Small Child	-0.527	0.458	-2.597***	0.427
Other Income	-0.004	0.010	-0.004	0.007
Student	-5.837***	0.536	-6.147***	0.435
Technical, Sales, Admin	-0.329	0.631	1.125**	0.543
Managerial, professional	2.483***	0.553	2.839***	0.455
Precision, craft & repair	0.302	1.215	1.713*	1.055
Ops, fabricators & laborers	1.441**	0.708	1.029	0.700
Other Occupation	5.907***	1.774	10.088***	1.263
Constant	44.508***	1.707	44.556***	1.730
Lambda	-5.467	6.749	-4.864	8.180
Selection Equation				
Marital Status	0.266***	0.083	0.167***	0.063
Number of children	-0.072*	0.041	-0.079*	0.043
Female	0.067	0.068	-0.023	0.053
Female with Small Child	-0.075	0.096	0.072	0.097
Single Parent	0.184*	0.110	0.063	0.114
Student	0.094	0.076	0.090	0.059
Black	0.024	0.096	-0.014	0.113
Hispanic	-0.024	0.080	0.089	0.096
Other Race	-0.064	0.120	0.001	0.094
Other Income	0.000	0.002	-0.001	0.001
Constant	1.073***	0.061	1.230***	0.044

Table C5. Hours Worked by Students With No PSE

	1993		1999	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
At-Risk	0.932	0.840	0.455	0.647
Female	-3.592***	0.894	-7.426***	0.945
Black	0.300	1.532	0.306	1.180
Hispanic	0.780	1.228	1.292	0.983
Small Child	2.428	1.676	0.883	1.592
Other Race	2.246	2.207	-0.003	0.635
Other Income	0.263**	0.116	-0.022	0.020
Technical, Sales, Admin	-0.451	1.006	0.083	1.027
Managerial, professional	4.358***	1.322	3.472***	0.939
Precision, craft & repair	6.317***	1.429	-0.953	1.342
Ops, fabricators & laborers	4.687***	1.133	1.414	0.934
Other Occupation	19.226***	1.610	7.090***	2.442
Constant	39.256***	1.109	43.372***	1.863
Lambda	-10.782*	5.798	-1.000	9.156
Selection Equation				
At-Risk	-0.244**	0.096	0.004	0.109
Marital Status	0.039	0.127	-0.088	0.159
Number of children	-0.110	0.134	-0.086	0.059
Female	-0.037	0.111	-0.276**	0.126
Single Parent	0.015	0.107	-0.013	0.187
Female with Small Child	-0.783***	0.199	0.171	0.154
Black	-0.365**	0.145	-0.048	0.195
Hispanic	-0.194	0.137	0.078	0.168
Other Race	-0.652***	0.182	0.016	0.278
Other Income	-0.030***	0.010	0.004	0.004
Constant	1.697***	0.104	1.465***	0.126

Table C6. Hours Worked by Students With No PSE in 1993

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
Female	-2.263*	1.207	-4.899***	1.538
Black	0.379	1.824	0.664	3.109
Hispanic	0.854	1.472	0.626	2.517
Other Race	0.239	3.205	5.057	3.454
Small Child	1.957	1.961	4.634	3.385
Other Income	0.330*	0.184	0.266	0.174
Technical, Sales, Admin	0.298	1.259	-1.546	1.750
Managerial, professional	5.433***	1.708	2.942	2.240
Precision, craft & repair	8.529***	1.737	3.475	2.595
Ops, fabricators & laborers	4.784***	1.398	4.639**	2.007
Other Occupation	17.860***	2.248	19.486***	2.592
Constant	39.142***	1.473	41.028***	1.998
Lambda	-11.215	7.277	-16.524	10.606
Selection Equation				
Marital Status	0.035	0.157	0.104	0.223
Number of children	-0.047	0.163	-0.268	0.242
Female	-0.095	0.142	0.056	0.181
Female with Small Child	-0.745***	0.251	-0.860***	0.334
Single Parent	0.030	0.137	0.025	0.175
Black	-0.374**	0.173	-0.370	0.270
Hispanic	-0.242	0.162	-0.113	0.269
Other Race	-0.790***	0.232	-0.436	0.307
Other Income	-0.043***	0.015	-0.023*	0.013
Constant	1.493***	0.129	1.661***	0.137

Table C7. Hours Worked by Students with No PSE in 1999

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
Female	-7.061***	1.218	-8.446***	1.427
Black	-0.041	1.436	3.955	3.177
Hispanic	2.141	1.344	1.193	2.801
Other Race	0.857	2.126	3.003	3.179
Small Child	-0.073	0.827	-0.061	1.108
Other Income	-0.024	0.026	-0.026	0.034
Technical, Sales, Admin	0.126	1.291	0.015	1.628
Managerial, professional	2.682**	1.209	4.375***	1.440
Precision, craft & repair	-1.447	1.923	-0.675	1.931
Ops, fabricators & laborers	1.689	1.153	0.824	1.531
Other Occupation	-5.772	3.829	13.736***	3.286
Constant	42.160***	2.127	45.241***	2.866
Lambda	7.674	9.529	-11.004	14.527
Selection Equation				
Marital Status	-0.213	0.216	0.057	0.243
Number of children	-0.083	0.075	-0.092	0.101
Female	-0.333**	0.167	-0.201	0.198
Female with Small Child	0.134	0.195	0.319	0.262
Single Parent	0.009	0.247	-0.131	0.295
Black	0.100	0.245	-0.385	0.334
Hispanic	0.286	0.208	-0.335	0.289
Other Race	0.185	0.381	-0.204	0.418
Other Income	0.005	0.005	0.002	0.005
Constant	1.511***	0.172	1.444***	0.160

Table C8. Hours Worked by Graduates with only a Bachelor's Degree in 1999

	Coefficient	Std. Err.
Hours Worked		
At-Risk	-0.744	0.594
Female	-4.251***	0.539
Black	-0.919	1.158
Hispanic	-0.734	0.956
Other Race	-1.871**	0.852
Small Child	-2.348***	0.860
Other Income	-0.006	0.010
Technical, Sales, Admin	3.017***	0.854
Managerial, professional	3.267***	0.726
Precision, craft & repair	4.865	3.273
Ops, fabricators & laborers	1.387	1.697
Other Occupation	10.434***	1.812
Constant	39.666***	2.247
Lambda	11.543	10.596
Selection Equation		
At-Risk	0.007	0.080
Marital Status	0.200**	0.085
Number of children	0.004	0.106
Female	0.057	0.069
Female with Small Child	-0.097	0.196
Single Parent	0.322	0.267
Black	-0.121	0.138
Hispanic	0.067	0.131
Other Race	0.005	0.113
Other Income	-0.002	0.001
Constant	1.234***	0.056

Table C9. Comparison of Hours Worked by Graduates with only a Bachelor's Degree in 1999

	At Risk		Non At Risk	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Hours Worked				
Female	-4.081**	1.606	-4.369***	0.547
Black	-1.726	2.919	-0.394	1.364
Hispanic	-0.946	2.135	-1.057	1.121
Other Race	-3.401	3.481	-1.758*	0.928
Small Child	-2.309	2.325	-2.614***	0.962
Other Income	0.011	0.027	-0.018*	0.011
Technical, Sales, Admin	2.182	2.472	3.254***	0.966
Managerial, professional	3.361	2.127	3.233***	0.821
Precision, craft & repair	10.740	16.596	4.399	3.430
Ops, fabricators & laborers	-0.621	4.619	1.966	1.959
Other Occupation	7.476	5.189	11.278***	2.054
Constant	37.936***	5.222	41.545***	2.220
Lambda	17.570	29.022	2.891	9.821
Selection Equation				
Marital Status	0.040	0.169	0.252**	0.099
Number of children	0.038	0.178	-0.021	0.134
Female	0.103	0.147	0.049	0.078
Female with Small Child	-0.361	0.328	0.019	0.250
Single Parent	0.390	0.410	0.275	0.369
Black	-0.262	0.204	-0.050	0.191
Hispanic	-0.042	0.210	0.114	0.169
Other Race	-0.311	0.206	0.121	0.137
Other Income	-0.002	0.002	-0.002	0.002
Constant	1.356***	0.126	1.207***	0.061

Table C10. Decomposition of Earnings Offer Differential for All Students in 1993

	Effects of differences in Characteristics	Explained part	Effects of Unobservables	Unexplained part
Earnings Offer Differential	-0.6725	100%	-0.6725	100%
Constant			1.2560	-187%
Predicted Hours	-0.1156	17%	-1.8340	273%
Work Experience	-0.0540	8%	0.0050	-1%
Work Experience Squared	0.0096	-1%	0.0064	-1%
Female	-0.0050	1%	-0.0893	13%
Black	-0.0078	1%	0.0124	-2%
Hispanic	-0.0200	3%	-0.0017	0%
Other Race	-0.0012	0%	-0.0340	5%
No PSE	-0.0125	2%	0.0011	0%
Student	0.0366	-5%	-0.1246	19%
Technical, Sales, Admin	0.0095	-1%	0.0707	-11%
Managerial, professional	0.0075	-1%	0.0292	-4%
Precision, craft & repair	0.0121	-2%	0.0406	-6%
Ops, fabricators & laborers	0.0342	-5%	0.0316	-5%
Other Occupation	-0.0008	0%	0.0272	-4%
Government Employee	-0.0045	1%	0.0332	-5%
Other Employee	0.0012	0%	0.0029	0%
Agriculture Industry	-0.0005	0%	0.0014	0%
Mining and Construction	-0.0044	1%	0.0099	-1%
Trans, Comm, Utilities	-0.0057	1%	0.0036	-1%
Wholesale and Retail Trade	-0.0350	5%	0.0480	-7%
Financial Industry	-0.0047	1%	0.0145	-2%
Manufacturing	-0.0383	6%	0.0336	-5%
Public Industry	-0.0165	2%	-0.0003	0%
Total	-0.2157	32%	-0.4568	68%

Table C11. Decomposition of Earnings Offer Differential for All Students in 1999

	Effects of differences in Characteristics	Explained part	Effects of Unobservables	Unexplained part
Earnings Offer Differential	0.0938	100%	0.0938	100%
Constant			-5.0624	-5397%
Predicted Hours	0.0175	19%	4.7738	5089%
Work Experience	-0.0302	-32%	0.0512	55%
Work Experience Squared	0.0227	24%	-0.0379	-40%
Female	0.0008	1%	0.3444	367%
Black	0.0144	15%	-0.0174	-19%
Hispanic	-0.0039	-4%	0.0088	9%
Other Race	0.0001	0%	-0.0001	0%
No PSE	0.0183	19%	0.0073	8%
Student	0.0003	0%	0.1221	130%
Technical, Sales, Admin	-0.0006	-1%	0.0047	5%
Managerial, professional	0.0142	15%	-0.1163	-124%
Precision, craft & repair	-0.0005	0%	-0.0009	-1%
Ops, fabricators & laborers	0.0017	2%	-0.0237	-25%
Other Occupation	-0.0014	-1%	-0.0091	-10%
Government Employee	0.0000	0%	-0.0032	-3%
Other Employee	0.0001	0%	-0.0011	-1%
Agriculture Industry	-0.0005	0%	0.0004	0%
Mining and Construction	-0.0013	-1%	-0.0046	-5%
Trans, Comm, Utilities	-0.0006	-1%	0.0004	0%
Wholesale and Retail Trade	0.0007	1%	0.0112	12%
Financial Industry	0.0024	3%	-0.0061	-6%
Manufacturing	-0.0020	-2%	0.0035	4%
Public Industry	-0.0011	-1%	-0.0021	-2%
Total	0.0511	54%	0.0427	48%

Table C12. Decomposition of Earnings Offer Differential for Students with No PSE in 1993

	Effects of differences in Characteristics	Explained part	Effects of Unobservables	Unexplained part
Earnings Offer Differential	0.6625	100%	0.6625	100%
Constant			-11.2240	-1694%
Predicted Hours	0.0838	13%	11.9929	1810%
Work Experience	0.0036	1%	0.0804	12%
Work Experience Squared	0.0233	4%	-0.0479	-7%
Female	-0.0369	-6%	0.5221	79%
Black	0.0100	2%	0.0010	0%
Hispanic	0.0297	4%	-0.0547	-8%
Other Race	0.0025	0%	-0.0127	-2%
Technical, Sales, Admin	-0.0123	-2%	0.0226	3%
Managerial, professional	-0.0022	0%	-0.1837	-28%
Precision, craft & repair	0.0035	1%	-0.2996	-45%
Ops, fabricators & laborers	0.0102	2%	-0.3336	-50%
Other Occupation	-0.0860	-13%	-0.2960	-45%
Government Employee	0.0036	1%	0.1067	16%
Other Employee	0.0053	1%	0.0015	0%
Agriculture Industry	0.0065	1%	0.0114	2%
Mining and Construction	0.0011	0%	0.0378	6%
Trans, Comm, Utilities	0.0000	0%	0.0202	3%
Wholesale and Retail Trade	-0.0343	-5%	0.1792	27%
Financial Industry	0.0269	4%	0.0244	4%
Manufacturing	-0.0483	-7%	0.1218	18%
Public Industry	0.0202	3%	-0.0176	-3%
Total	0.0102	2%	0.6522	98%

Table C13. Decomposition of Earnings Offer Differential for Students with No PSE in 1999

	Effects of differences in Characteristics	Explained part	Effects of Unobservables	Unexplained part
Earnings Offer Differential	0.6924	100%	0.6924	100%
Constant			1.0890	157%
Predicted Hours	-0.7401	-107%	0.1888	27%
Work Experience	0.0222	3%	0.0227	3%
Work Experience Squared	-0.0170	-2%	-0.0334	-5%
Female	0.1442	21%	-0.0690	-10%
Black	-0.0441	-6%	0.1001	14%
Hispanic	-0.0515	-7%	-0.0306	-4%
Other Race	-0.0028	0%	0.0090	1%
Technical, Sales, Admin	-0.0020	0%	-0.0209	-3%
Managerial, professional	0.0510	7%	0.0725	10%
Precision, craft & repair	0.0013	0%	0.0031	0%
Ops, fabricators & laborers	-0.0292	-4%	-0.1075	-16%
Other Occupation	0.0569	8%	0.0307	4%
Government Employee	-0.0079	-1%	0.0248	4%
Other Employee	-0.0010	0%	-0.0211	-3%
Agriculture Industry	-0.0006	0%	-0.0005	0%
Mining and Construction	0.0047	1%	-0.0001	0%
Trans, Comm, Utilities	0.0010	0%	-0.0001	0%
Wholesale and Retail Trade	0.0002	0%	0.0161	2%
Financial Industry	0.0000	0%	-0.0035	-1%
Manufacturing	0.0011	0%	-0.0013	0%
Public Industry	0.0030	0%	0.0342	5%
Total	-0.6106	-88%	1.3030	188%

Table C14. Decomposition of Earnings Offer Differential for Graduates with only a Bachelor's Degree in 1999

	Effects of differences in Characteristics	Explained part	Effects of Unobservables	Unexplained part
Earnings Offer Differential	0.2159	100%	0.2159	100%
Constant			2.6157	1211%
Predicted Hours	-0.0752	-35%	-2.4200	-1121%
Work Experience	-0.0278	-13%	0.0446	21%
Work Experience Squared	0.0326	15%	-0.0458	-21%
Female	0.0089	4%	-0.1881	-87%
Black	0.0052	2%	-0.0094	-4%
Hispanic	-0.0085	-4%	-0.0065	-3%
Other Race	-0.0012	-1%	-0.0063	-3%
Technical, Sales, Admin	-0.0001	0%	0.0505	23%
Managerial, professional	-0.0013	-1%	0.2399	111%
Precision, craft & repair	0.0011	0%	0.0023	1%
Ops, fabricators & laborers	0.0003	0%	0.0010	0%
Other Occupation	0.0002	0%	0.0152	7%
Government Employee	0.0033	2%	-0.0022	-1%
Other Employee	-0.0011	-1%	0.0029	1%
Agriculture Industry	0.0001	0%	0.0000	0%
Mining and Construction	-0.0002	0%	-0.0019	-1%
Trans, Comm, Utilities	0.0012	1%	0.0007	0%
Wholesale and Retail Trade	0.0000	0%	0.0070	3%
Financial Industry	0.0013	1%	-0.0109	-5%
Manufacturing	0.0010	0%	-0.0026	-1%
Public Industry	0.0020	1%	-0.0118	-5%
Total	-0.0582	-27%	0.2741	127%

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