

**FACTORS THAT ARE RESPONSIBLE FOR HIGH SCHOOL DROPOUTS IN
THE U.S. AND IMPACT OF HIGH STAKES TESTING POLICY**

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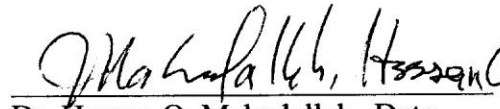
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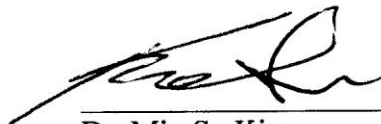
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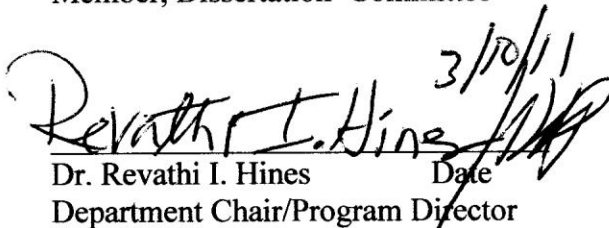
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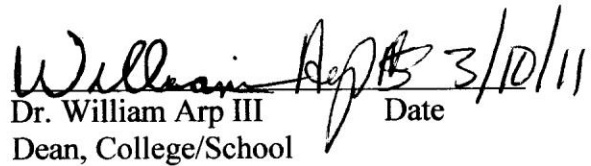

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ABSTRACT

The problem of high school dropout has been studied for several decades and now it has reached the level of a national crisis. This study seeks to find the factors that are responsible for the high school dropout rate in the United States (50 states) and the impact of high stakes testing policy; namely, high school exit examinations on high school dropouts, employing panel data analysis, difference in difference estimator, and feasible generalized least square estimator using the following variables: high stakes testing policy, poverty, unemployment, population change, attendance rate, educational attainment of adults, teacher/student ratio pregnancy rates for high school age, ethnicity, expenditures on student household income, and school size. Also, the writer utilized proxy variables to have better estimates. This study found that student/teacher ratio, pregnancy rate for high school age, ethnicity, expenditure on students, household income, and school size are related to high school dropout rates. Moreover, the high stakes testing policy has a negative impact on the high school dropouts.

Chapter I. INTRODUCTION

Introduction

The problem of high school dropouts is what school administrators, parents and policy makers have had to deal with for the past several decades in the United States. While the rates of high school dropout vary from state to state and from county to county, it is still a problem that needs to be addressed by not only school administrators and parents but also by the policy makers. In the United States, this problem has been getting more attention recently.

The writer has been interested in this issue for a long time, since he has been involved in education and public policy and administration. Also, the writer believes that, by examining the impact of this problem on the society, he will be contributing to a better understanding of this issue, so that policy makers in the future will be able to formulate appropriate policies to deal with this issue.

The need for close examination of the issue of high school dropout is based on the writer's perspective that high school students are an important segment of society. Therefore, the activities that they are engaged in, as a result of their inability to attend and graduate from high school tend to affect other segments of the society or the whole society. For instance, a study shows that students who drop out from schools are more likely than other students, who graduate from schools, to experience health problems, get involved in criminal activities, and become dependent on welfare and other government programs (Martin, Tobin, and Sugai, 2002).

In essence, since high school students make up part of the social system in our society and they contribute to the functioning of the system, their activities negatively or positively affect how the society functions. Hence, as a student of public policy, it is the writer's view that examining the factors that are responsible for high school dropouts, and the effect of the high stakes testing policy on the high school dropouts in the United States, would contribute to finding meaningful solutions for addressing this phenomenon which has a significant impact on society. This problem of high school dropouts is now a "national crisis".

Statement of the Problem

Americans are known for many achievements: a high standard of living, discoveries, inventions, and the ability to organize and overcome problems. In terms of technological achievements, Americans have produced the space shuttle, computers, medical technology, and have accomplished many other technological successes. However, as important as these achievements are, they are really by-products of greatest achievements or an even greater American accomplishment-American education.

Smith (1902) stressed the importance of education: "The difference between the most dissimilar characters, between a philosopher and a common street porter, seems to arise not so much from nature, as from habit, custom and education" (p.58).

However, according to the US Department of Education (2010), 613,379 who were enrolled in grades 9 through 12 in the school year of 2007-08 left school without successfully completing a high school program.

This problem of high school dropouts brings serious consequences to our society in the long run. One study shows that students who drop out from schools are more likely

than other students, who graduate from schools, to experience health problems, get involved in criminal activities, and become dependent on welfare and other government programs (Martin, Tobin, and Sugai, 2002).

Furthermore, the recent trend of adoption of high stakes testing policy by states may be contributing to the problem of high school dropouts. To discover the impact of the high stakes testing policy and factors that are responsible for causing the increase of high school dropouts in the United States, this research will use a panel data set on the 50 states in the U.S. and employ quantitative methods.

Research Objectives

For many decades, researchers have examined a number of factors that would contribute to the high school dropout in the United States. Based on the findings, policy makers, educators, and public administrators have been tackling the problem. However, their efforts have not created the ideal environment for the students who leave their schools. Besides the preexisting factors, the recent trend of adoption of high stakes testing policy presents another controversy to the schools.

In this research, the writer intends to lay out the factors that are responsible for the high school dropout and explore the effect of the adoption of high stakes testing policy by the states on high school dropout.

Significance of the Study

This research will help policy makers to understand the nature of the problem of high school dropouts in the United States, so that policy makers can take more appropriate measures to tackle this problem. Furthermore, this research will illuminate the controversy over the education policy-high stakes testing policy. By revealing the effect of the policy on

students, this research will help policy makers to take an appropriate course of action to create a desirable educational environment for students.

In spite of the efforts made by former administrators, the problem of high school dropouts is still present in the United States. Although, in many decades, policy makers, educators, and public administrators have spent resources to deal with the problem of high school dropouts in the United States by creating commissions and implementing policies, the problem still exists. This problem of high school dropouts varies from state to state or region to region for a number of reasons, and it is not easy to grasp the nature of the problem. Therefore, it is important to have comprehensive understanding of the characteristics of the problem in a region where a policy is implemented.

However, there is no longitudinal study that covers the 50 states using aggregated data for all the population in high school. Previous studies are limited to regions or schools or, small sample sizes and/or short periods of time. Also, it is not clear how the high stakes testing policy has been contributing to the high school dropout problem. Policy makers believe that the policy has been effective and has helped students' academic achievement, without having negative effect on high school dropout rates nationwide. Yet, the high stakes testing policy has been controversial for the last few decades. We need to review this policy to see if there has been a positive or negative impact on students nationwide. This research will contribute to a comprehensive understanding of the characteristics of the problem and will help policy makers to formulate policies that will reduce the high school dropout rate. It also will help policy implementers and educators to take appropriate actions to tackle the problem.

Research Questions

To find out the factors that are responsible for high school dropout and to explore the effect of high stakes testing policy in the United States, this study answers the following research questions:

1. What factors are responsible for high school students' dropping out of schools?
2. How has the high stakes testing policy affected the high school dropouts?

Definition of Terms

Dropout Rate

In government publications, such as produced by the Department of Education, there are two types of rates for high school dropouts that are reported. One is an event dropout rate and another one is a status dropout rate. Event dropout rates refer to the percentage of students who drop out of high school each year. High school dropout rates are the students who were enrolled in October, but, the following year they have not completed high school and are not enrolled in school. Status dropout rates refer to the percentage of 16 to 24 year olds who are not enrolled in school and have not earned a high school credential. Since this study looks at the phenomenon of high school dropouts, the writer uses the event dropout rates.

High Stakes Testing Policy

“High stakes tests are tests from which results are used to make significant educational decisions about schools, teachers, administrators, and students. High stakes testing policies have consequences for schools, for teachers, and for students” (Amrein & Berliner, 2002, p.1). In this study, high stakes testing is defined to be a high school exit examination that withholds high school students from graduating from a high school if

Table 1

Characteristics of State High School Exit Examination as of 2006 (Experimental Group)
(N = 20)

| State | Current Exam | Year First Withheld | Subjects | Grade First Tested |
|------------|---|---------------------|--|--------------------|
| Alabama | Alabama High School Graduation Exam (AHSGE) 3ed Edition | 2001 | Reading, Language, Math, Science, Social Studies | 10th |
| Alaska | Alaska High School Graduation Qualifying Exam (HSGQE) | 2004 | Reading, Writing, Math | 10th |
| Arizona | Arizona's Instrument to Measure Standards (AIMS) | 2006 | Reading, Writing, Math, Science | 10th |
| California | California High School Exit Examination (CAHSEE) | 2006 | ELA, Math | 10th |
| Florida | Florida Comprehensive Assessment Test (FCAT) | 2003 | Reading, Math | 10th |

(table con'd.)

| | | | | |
|---------------|--|------|---|-----------------------|
| Georgia | Georgia High School Graduation Tests (GHS GT) | 1994 | ELA, Writing, Math, Science, Social Studies | 11th |
| Idaho | Idaho Standards Achievement Test (ISAT) | 2006 | Reading, Language usage, Math, Science | 10th |
| Indiana | Graduation Qualifying Exam (GQE) | 2000 | ELA, Math | 10th |
| Louisiana | Graduation Exit Examination (GEE) | 2003 | ELA, Math, Science, Social Studies | 10th |
| Massachusetts | Massachusetts Comprehensive Assessment System (MCAS) | 2003 | ELA, Math | 10th |
| Mississippi | Mississippi Subject Area Testing Program (SATP) | 2006 | English II (with writing component), Algebra I, Biology I, U.S. history from 1877 | Varies |
| Nevada | High School Proficiency Examination (HSPE) | 2003 | Reading, Writing, Math, Science | 10th, writing in 11th |
| New Jersey | High School Proficiency Assessment (HSPA) | 2003 | Language arts literacy, Math | 11th |

(table con'd.)

| | | | | |
|----------------|--|------------------------------|--|--------|
| New Mexico | New Mexico High School Competency Examination (NMHSCE) | 1990 | Reading, Language arts, Written composition, Math, Science, Social Studies | 10th |
| New York | Regents Examinations | 2000 | ELA, Math, Science, Global history and geography, U.S. history and government | Varies |
| North Carolina | North Carolina Competency Test and Test of Computer Skills | 1981, 2001 (computer skills) | Reading comprehension, Math, Computer skills (2001) | 8th |
| South Carolina | High School Assessment Program (HSAP) | 2006 | ELA, Math, | 10th |
| Tennessee | Gateway Examinations | 2005 | English I, II, and III, Algebra I and II, Geometry, Biology I, Chemistry, U.S. history | Varies |
| Texas | Texas Assessment of Knowledge and Skills (TAKS) | 2005 | ELA, (reading/writing), Math, Science, Social Studies | 11th |

(table con'd.)

| | | | | |
|----------|----------------------------|------|---|--------|
| Virginia | Standard of Learning (SOL) | 2004 | English (reading/writing) Algebra I, II, Geometry, Biology, Earth Science, Chemistry, World history to 1500, World history from 1500 to present, Virginia and U.S. history, World geography | Varies |
|----------|----------------------------|------|---|--------|

Note. From “State High School Exit Exams: Trends in Test Programs, Alternate Pathways, and Pass Rates” by Y. Zhang, & J. Jennings, 2009.

the student fails on the examination. This study looks at the high school exit examination and its consequence for the high school students.

The Center on Education Policy (CEP) (2009) publishes a report on high stakes testing for high school students annually, entitled *State High School Exit Exams: Trends in Test Programs, Alternate Pathways, and Pass Rates*. This report identifies when each state started and will start the high school exit examination. In addition, this report gives a description of the high stake testing of the states.

Table 1 provides a description of high school exit examinations operated by the states. As of 2006, 20 states have the high school exit examinations that withhold students from graduating from high school if they fail on the examination. In addition to these states, several other states such as Arkansas, Maryland, Minnesota, Ohio, Oklahoma, and Washington adopted the high states testing policy for high schools after 2006.

Chapter II. REVIEW OF THE LITERATURE

Introduction

The purpose of this section is to search for the related literature to identify variables that are responsible for high school dropouts and the mechanisms and theory behind those factors. There are two parts used to identify the factors. In the first part, the writer explores the factors which were related to school dropout in general. In the second part, the writer explores the effect of high stakes testing policy on high school dropouts.

Review of Research on School Dropouts

There have been a number of theories presented to understand the phenomenon of high school dropouts in past several decades in the United States. The literature shows that most of the studies on high school dropouts fall into two categories. A large portion of the studies focus on the identification of the variables that are associated with at-risk students or the causes of dropout. Another group of studies focus on dropout prevention strategies or programs. My objective is to identify the cause of the problem of high school dropout and application of those results to the current dropout prevention programs and education policies, to have better outcome. Therefore, in this study, I primarily focus on the first part-identification of the variables that are associated with high school dropouts.

Rumberger (2001) introduces two frameworks that categorize the factors leading to higher high school dropout rates, and these frameworks help to generalize the factors to understand the theories more clearly. He indicates that one is an individual perspective and another is an institutional perspective. The individual perspective is based on the

students' characteristics, such as value, attitudes, and behaviors. Student engagement, academically and socially, are the indicators of students' decisions to leave school. An institutional perspective suggests that individual perspectives, attitudes, and behaviors are affected by the institutional setting where students live, such as families, schools, and communities. Using Rumberger's framework, theories in those individuals, families, schools, and communities will be examined below.

Individual Framework

Several psychological factors influence dropout behaviour. The role of individual ability has been widely studied. Most studies concluded that people who drop out demonstrate lower levels of ability than students who finish high school, or they were unable to perform in the class well (Combs & Cooley, 1968; Hill, 1979).

Measures of self-confidence and sociability have also been used to distinguish between high school dropouts and graduates (Rumberger, 1983). In addition, educational and occupational aspiration also appear to be important factors (Howell & Frese, 1982).

There may be cultural differences between population subgroups in the importance attached to completing high school that could also lead to different reasons for dropping out among race-ethnic minorities of each sex. Some traditional Hispanic families may not expect their female children to complete high school to fulfil their later valued roles as wives and mothers (Valdivieso & Nicolau, 1994).

Rural populations may similarly place less emphasis on completing high school on the road to adulthood (De Young, 1992).

Waite and Moore (1978) conducted research on the relationship between a young woman's pregnancy and educational attainment. They conclude that if a woman has a

educational attainment depends on age at first birth.

Marini (1978) argues that women's marriage has an effect on women's educational attainment. She concludes that age at first marriage does not have much effect on the educational attainment of men, but it has significant impact on women's educational attainment and limits their educational aspirations.

Likewise, Howell & Frese (1982) argue that early marriage and teenage parenthood are associated with dropout behavior. Those students are likely to have their schooling disrupted or terminated after marrying or becoming a parent. Dropouts are also more likely than other young people to engage in crime and have drinking problems (Stoup and Robins, 1972).

Cairns et al. (1989) argue that variables like aggressiveness, doing poorly in school subjects, being older than peers have negative effects on dropouts. Wood (1993) found that changing schools increased the probability that a student would drop out of school.

In a study of middle school dropouts, Rumberger (1995) found that policies affecting student transfers would influence a student's decision to stay in school. The transition of students from elementary school to middle school can be compared to a student transfer requiring the adjustment of all students to a new learning environment.

Christle, Jolivet, and Nelson (2007) examined school related variables such as achievement test scores, retention, attendance rate, student behavior. Hanson & Ginsburg (1988) focused on the effect of value. They argued that values shaped by religion, peers, and parents have significant effects on students' behavior. Especially, if the value stresses on responsibility, students are less likely to drop out of schools.

Roderick (1994) investigated the association between retention and dropouts. She concluded that the impact of being overage for grade during adolescence is responsible for a large proportion of the higher dropout rates among retained youths.

Eckstein & Wolpin (1999) argue that high school dropouts have lower school ability and/or motivation, lower expectations about the rewards from graduation, a comparative advantage at jobs that are done by non-graduates, and place a higher value on leisure and a lower consumption value on school attendance. They also found that working while in school reduces school performance.

Institutional Framework

Family

The variable which has been looked at most is the socioeconomic status of family. In 1958, “Tesseneer and Tesseneer reviewed 20 dropout studies. In 1984, Steinberg, Blinde, and Chan reviewed 12 additional studies. Both research teams concluded that the socioeconomic status of the family is a variable which most clearly and consistently distinguishes high school dropouts from graduates” (Frank, 1990, p.34).

Suh and Suh (2007) concluded that socioeconomic status has more of an effect on dropout rates than other factors such as, academic risk (low GPA) and behavioral problems. They also looked at low socioeconomic status, poor academic achievement, and suspension from school, and concluded that the low socioeconomic status is one of the major factors for the dropout rate. Likewise, in 1983 and 1987, Rumberger concluded that socioeconomic status was a primary contributing factor in high school dropouts.

There are many other variables, for example, family background, psychological factors, marriage and pregnancy, crime and drinking related problems, environmental

factors, and school-related problems which have been looked at.

Again, previous studies have identified several aspects of family background that affect the likelihood of dropping out of high school. The educational attainment of both parents represents two important aspects. According to studies by Hill and Mare, better-educated parents tend to have fewer children that drop out of high school (Hill, 1979; Mare, 1980).

There are some possible reasons why this is the case. Hill and Stafford (1977) reveal that the better-educated parents can influence their children's educational aspirations and if they spend more time with their children. When they do, the children have higher aspiration and achievement.

Income is another aspect of family background that tends to influence the high school dropout rate. One reason is that children from poor families may feel pressure to contribute to their families. Thus, they may be more likely to drop out of school to seek work (Lerman, 1972; Stroup & Robins, 1972). Family structure also appears to be important and related to high school dropout rates. Children from broken families, where one or both parents are absent, may be less likely to find the support and encouragement that need to keep them in school (Masters, 1969; Howell & Frese, 1982). Family size, housing conditions, and geographic location also affect the propensity to drop out of school (Hill, 1979; Mare, 1980).

A more detailed investigation of family variables in research on the family was done in 1990, particularly, research on the effects of family problems and stressors. It showed a number of household stressors as independent variables: single parent (separated, divorced, widowed, never married), three generations of family members in the

household, six or more persons in the household, person with serious health problems, a member hospitalized for six or more days in a previous year, parents whose health problems limit functioning, persons with a serious emotional or behavioural problem, persons reported as mentally retarded, the presence of a teen who is pregnant or is a parent, two or more family moves in the last two years, a person with problems involving police or accusation of a crime, persons abusing drug or alcohol, serious family arguments, adult or child abuse explanation, a person not covered by health insurance, day care arrangements necessary for members, a problem with establishing or collecting child support, law-related child problems (paternity, visiting, custody), and member supporting someone, who lives elsewhere. And, the study concludes that the number of stressors in a household is positively related to the probability that the household contains a youth that is a dropout or at high risk for dropout (Frank, 1990).

Cervantes (1965 & 1966) argues that the cohesiveness of family, including student's feeling about being accepted and depth of communication with family members are important factors. Students can be encouraged by families while staying in a school. He further conducted research on urban working class families to conclude that parental authority is a factor for high school dropout. If the parent's authority is weak or there is no control over children and the authority style is matriarchal, students are more likely to drop out of school.

Rumberger et al. (1990) argues that family decision making, parenting style, parents' reaction to grades, parents' educational involvement are important factors. Dropouts are more likely to make a decision on their own, instead of the family. Fitzpatrick & Yoles (1992) argue that "family structure, measured by the percentage of female-headed

families with children, is a critical predictor of both school structure and dropout rates” (p.76).

School

Wehlege (1987) emphasized a need to study school-related variables associated with student dropouts in addition to the characteristics of student dropouts. He argued that small size or student/teacher ratio, small program size for more autonomy, teachers culture such as belief in the success of at-risk students and collegiality, and experiential learning in curriculum have effect on dropouts.

Guryan (2004) found that desegregation policy led to declines in black high school dropout rates while the rate for whites did not change. Desegregation and interracial student composition reduced overall high school dropout rate.

Lee and Burkam (2003) looked at the relationship between school’s curriculum and size and dropout behavior. They concluded that, schools, which offer mainly academic courses and few nonacademic courses, have lower dropout rates. Also, students in schools enrolling fewer than 1,500 students more often stay in school.

Likewise, Pittman & Haughwout (1987) argue that there is an association between school size and dropouts. If the school size is larger, there is a positive impact on students because of more variety of programs. However, the larger school or consolidation of schools have negative impact on school social climate and this effect off-set the positive impact, more programs, as a result, they have higher dropout rate.

Fitzpatrick & Yoles (1992) argue that “total educational expenditures per students' average daily attendance are a significant determinant of school structure and exert the largest indirect effect on dropout rates” (p.76).

Community

Environmental factors, such as geographic location of current residence and local employment conditions, influence dropping out as well (Dentler & Warshaver, 1965). Harding (2003) looked at neighborhood effects on the high school dropout rate and he argued that the neighborhood poverty has an effect on the high school dropout rate and teenage pregnancy. He concluded that students in high-poverty neighborhoods are more likely to drop out of high school and have a teenage pregnancy than those in low-poverty neighborhoods.

Likewise, Fischer and Kmec (2004) focused on the neighborhood socioeconomic conditions and dropout rate. They argued that residents of low socioeconomic neighborhoods lack access to quality social networks. That leads to the lack of role models to guide the students and encouragement for completion of school. Also, seeing adults struggling for employment may discourage students from completing school.

Dentler and Warshaver (1965) argue that there is a relationship between characteristics of local society including employment conditions and dropout and illiteracy. Likewise, Olsen & Farkas (1989) argue that employment opportunity in a community has a positive effect on high school dropout. If an employment rate in a community rises, the high school dropout rate goes up as well.

This research examines factors that are responsible for high school dropout by utilizing some of the suggested variables in the literature review. This will be carried out to test whether these factors are also responsible for increased high school dropout rates. Also, in general, it is much easier to predict dropout behaviour from various factors than to simplify and identify what really motivates a student to leave a school.

Review of Research on High Stakes Testing Policy and School Dropouts

“High stakes tests are tests from which results are used to make significant educational decisions about schools, teachers, administrators, and students. High stakes testing policies have consequences for schools, for teachers, and for students” (Amrein & Berliner, 2002, p.1).

These consequences vary from state to state. Schools could be rewarded or closed or reorganized as a result of the performance on the high stakes examinations. Teachers and administrators, also, could be rewarded or removed as a result of the performance under the high stakes testing policy. The most significant consequence is attached to the students. The high stakes testing examination is used to determine whether or not the students are promoted or retained or held from graduating from the schools.

Previous studies do not seem to have found common ground. There are two opposite sides on the effects of the high stakes testing policy in the previous literatures, especially regarding the high school dropouts. Advocates of the policy argue that it does not have a negative impact on the high school dropouts. Instead, the policy creates a positive impact on the students. The policy motivates students to work harder toward better academic achievements, especially the students who are performing poorly. On the contrary, opponents of policy argue that, by failing the examination and being retained, students are discouraged from continuing to attend schools; as a result, they drop out of schools. Many studies indicate that the policy negatively affects low performing students.

The mechanism of this retention and high school dropouts is described by Roderick (1994). Roderick (1994) conducted a longitudinal study of the elementary, middle, and early high school antecedents to school leaving, among one cohort of students from an

urban Massachusetts public school system. The study found that students who ended sixth grade and were overage for grade experienced substantial disengagement during middle school and almost one quarter of the students dropped out, and those who remained had significant declines in attendance. She indicates that the impact of being overage for grade during adolescence may explain a large proportion of the higher dropout rates among the retained students. She states that “Students who experience retention may face an increased risk of school leaving because they do more poorly in school, or have lower self-esteem as a result of that retention. Those who are retained may also be at a higher risk of dropping out because grade retention makes them overage for grade” (Roderick, 1994, p.730). The students who are retained in grades are older than other students may feel different than their peers and may feel discouraged. “Being overage for grade may become particularly important during adolescence when students are more responsive to the views of their peers and are forming a sense of identity and school attachment based in part on their assessment of their relative status” (Roderick, 1994, p.730).

Archer and Dresden (1987) examined minimum competency testing (MCT) in Texas. They concluded that the MCT in Texas discouraged at risk students from staying in schools. Consequently, the MCT in Texas created a new kind of dropout. Kreitzer et al. (1989) reviewed the research on the impact of the MCT programs which were used for promotion or graduation decisions. They indicated that there was not enough evidence that the tests lowered the dropout rates. Rather, the MCT could encourage high risk students to drop out of schools early.

MacMillan (1990) conducted a research on high school students in California. He compared students who were passing the MCT to students who are not passing the MCT. He concluded that the students who were failing the MCT were up to 10 times more likely than the students who are passing the MCT to drop out of the schools.

Coates & Wilson-Sadberry (1994) used data from the *High School and Beyond* longitudinal study completed in 1986 by the National Center for Educational Statistics with a sample consisting of 11,995 randomly selected seniors from more than 1,000 schools across the United States to estimate the effect of the MCT on students' achievement and dropouts. They argued that the MCT affected low achieving students positively while it affected high achieving students negatively. As a result, higher dropout rates may be noticeable among those schools attended primarily by Asian American and European American students.

Griffin & Heidorn (1996) examined the effect of a minimum competency test in Florida. They argued that the test had a negative impact on high school dropouts. However, the impact was limited and affected only the students who were doing well academically, since they felt embarrassed or experienced emotional problems. They further argued that the test did not show any negative impact on the students with poor academic records and minorities in contradicting other research, where they argue that the test has a negative impact on the minority and the students who perform poorly.

Clarke et al. (2000) examined how high stakes testing policy affected the school completion and the school dropouts. They reported 5 different analyses. The first analysis is from the era of MCT. There was no MCT in half of the 10 states with the lowest dropout rates, and the states with the highest dropout rates had MCT programs. A second

analysis showed that in schools with proportionately more students of low socioeconomic status that used high stakes minimum competency tests, early dropout rates, between 8th and 10th grades, were 4 to 6 percentage points higher than in schools that were similar except for the high stakes test requirement. The third analysis came from high school exit examination and dropouts in Florida. It was suggested that only for students with moderately good grades was a significant increase in dropping out associated with failure of the high school graduation test. A fourth analysis came from the high stakes testing in Texas, where findings suggested that some high school sophomores dropped out of school because of the requirement of satisfactory performance on the Texas Assessment of Academic Skills. A final analysis was the relationship among high stakes testing, grade retention, and dropout rates. These analyses generally suggested that grade retention makes students more likely to drop out. Interaction with graduation test requirements may result in increased numbers of dropouts, especially, Blacks and Hispanics.

Haney (2000) contradicted the success of the Texas Assessment of Academic Skills (TAAS) which was introduced in 1990-91. Many studies in the late 1990's concluded that the state of Texas had made miraculous progress in reducing dropouts and increasing achievement. He counter-argues against the studies concluded that the policy actually affected at risk students negatively, especially, Blacks and Hispanics in terms of the achievement. Further, the policy did not have positive impact on the dropouts.

Catterall (1989) revealed that a high school exit examination has a negative impact on high school dropout. He argues that test failure reduce academic aspirations and, thereby, contribute to decisions to drop out of school. Likewise, Jacob (2001) found that

graduation tests do not have much impact on math or reading achievement. Instead, “Although graduation tests have no appreciable effect on the probability of dropping out for the average student, they increase the probability of dropping out among the lowest ability students” (p.99).

Amrein & Berliner (2002) examined 16 of the 18 states that had implemented high school graduation exams as of 2002: Alabama, Florida, Georgia, Louisiana, Maryland, Mississippi, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Virginia. They found that the dropout rate increased in 8 states and decreased in 5 states after high school graduation exams were implemented, which meant that, after high school graduation exams were implemented, 62 percent of the states posted an increase in the dropout rate. Therefore, they concluded that the high school exit examination had a negative effect on the high school dropouts.

Reardon & Galindo (2002) used data from the National Educational Longitudinal Survey (NELS) to examine the relationship between high stakes tests used for grade promotion and dropout rates. Their analysis revealed that the presence of an eighth grade promotion test requirement is strongly associated with an increased probability of dropping out prior to tenth grade, after controlling for other factors.

Horn (2003) examined high stakes testing in Massachusetts and North Carolina to conclude that non-White, non-Asian students, as well as students with special needs and English Language Learners, are among the groups most deeply affected by high stakes testing.

Allensworth (2005) examined dropout rates after implementation of an eighth grade promotion standard in Chicago. The research revealed that the retention by the policy had

a negative effect on dropouts, yet the relationship was smaller than seen with traditional teacher initiated retention and was unrelated to the timing of dropping out. Overall, slight decreases in dropout rates among the 90% of students who were not retained counterbalanced the higher dropout rates among those retained.

Warren & Edwards (2005) studied the association between high school exit examination requirements and students' chances of obtaining diplomas, acquiring general educational development (GED), or leaving school with neither credential, by using data from the National Education Longitudinal Study of 1988. They concluded that high school exit examinations that existed in 1990's are not associated with increased chances of obtaining a GED or of leaving school with neither a GED nor a diploma, even among low socioeconomic status and low achieving students.

Warren & Jenkins (2005) examined the relationship between high school exit examinations and high school dropout rates and racial/ethnic and socioeconomic inequalities in high school dropout rates in Florida and Texas, by using data from the 1968-2000 October Current Population Surveys. They identified students who left school without obtaining any high school credential and students who obtained general equivalency diploma as dropouts, and used them as dependent variables. They concluded that the state high school exit examinations were not independently associated with higher dropout rates or greater inequalities in dropout rates, even among at risk students.

Warren et al. (2006) used a fixed effects model on a panel data with 28 years and 50 states plus District of Columbia to estimate the association between high school exit examinations and state-level public high school completion rates. They found that rigorous state high school exit examinations that have been implemented recently in some

states are associated with lower public high school completion rates and higher rates of General Educational Development test taking. In addition, the study found that the association between state policies on high school exit examinations and public high school completion grows stronger as states become more racially and ethnically diverse and as poverty rates increase.

Jacob & Dee (2009) used the data from 2000 Census and the National Center for Education Statistics' Common Core of Data (CCD) to analyze the relationship between the exit examination in Minnesota and dropouts. According to this analysis, Minnesota's exit exam increased the dropout rate in urban and high-poverty school districts as well as in those with a relatively large concentration of minority student, especially blacks. However, they also found that Minnesota's exit exam lowered the dropout rate in low-poverty and suburban school districts. As a result, the research suggested that exit exams have the capacity to improve student and school performance but also appear to have exacerbated the inequality in educational attainment.

In this study, the variables, which will be looked at are high stakes testing policy (program), poverty rate, unemployment rate, educational attainment of 25 and over, student/teacher ratio, expenditure per student, household income, school size, population change, attendance rate, pregnancy rate, and racial composition (% of each minority group).

Research Hypothesis

In the literature review, some studies show that high stakes testing policy affects dropout rate negatively. If students fail on the exit examination and are discouraged from completing high school, which may result in retention, those factors will have negative

impact on dropout rate. Accordingly, I assume by the same reasoning.

Hypothesis 1: If a state adopts high stakes testing policy, high school students are more likely to drop out of school.

In the literature review, some studies show that socioeconomic conditions of community affect the dropout rate. If students live in high poverty areas with less access to quality social networks and mentoring, they are discouraged from going to school.

This has a negative impact on dropout rate. Accordingly, I assume the same reasoning.

Hypothesis 2: If the poverty rate is high, high school students are more likely to drop out of school.

In the literature review, some studies show that socioeconomic conditions of community affect dropout rate. If the student lives in high employment opportunity area, students are more likely to drop out of schools. Reversing, I assume by the same reasoning.

Hypothesis 3: If the unemployment rate is high, high school students are less likely to drop out of school.

In the literature review, some studies show that parents' education affects the dropout rate. If parents' academic achievement is high, they can earn more, and they can promote the aspirations of students, and possibly spend more time with them. That has positive impact on the dropout rate. Accordingly, I assume by the same reasoning.

Hypothesis 4: If the parents' education is low, high school students are more likely to drop out of school.

In the literature review, some studies show that student/teacher ratio affect dropout rate. If the student/teacher ratio is high and students receive less attention, students are

discouraged from completing school. Accordingly, I assume that higher student/teacher ratios negatively affect the high school dropout rate.

Hypothesis 5: If the student/teacher ratio is high, high school students are more likely to drop out of school.

In the literature review, some studies show that expenditure on schools affects the dropout rate. If the expenditure per student is low, then that affects class size, quality of teachers and facilities. That has a negative impact on dropout rate. Accordingly, I assume the same reasoning.

Hypothesis 6: If the expenditure on student is low, high school students are more likely to drop out of school.

In the literature review, some studies show that household income affects the dropout rate. If student's household income is low and the student is put under pressure to work or cannot getting enough financial support, that has negative impact on dropout rate. Accordingly, I assume by the same reasoning.

Hypothesis 7: If the student's household income is low, high school students are more likely to drop out of school.

In the literature review, some studies show that school size affects dropout rate. If the school has a large number of students and has poor social climate. That has negative impact on dropout rate. Accordingly, I assume by the same reasoning.

Hypothesis 8: If the school size is large, high school students are more likely to drop out of school.

In the literature review, some studies show that the student's mobility affects the dropout rate. If a student moves often and has difficulty adjusting to a new environment,

that has negative impact on the dropout rate. Accordingly, I assume by the same reasoning.

Hypothesis 9: If the student's mobility is high, high school students are more likely to drop out of school.

In the literature review, some studies show that student's engagement affects the dropout rate. If the student's attendance rate is low, that has negative impact on the dropout rate. Accordingly, I assume the same reasoning.

Hypothesis 10: If the attendance rate is low, high school students are more likely to drop out of school.

In the literature review, some studies show that the student's pregnancy affects the dropout rate. If a student becomes pregnant at school age, that has negative impact on the dropout rate. Accordingly, I assume by the same reasoning.

Hypothesis 11: If the pregnancy rate is high, high school students are more likely to drop out of school.

In the literature review, some ethnic groups are more likely to drop out. If student is from a Hispanic background, his or her high school dropout behavior tends to be more likely. Accordingly, I assume by the same reasoning.

Hypothesis 12: If the students are Hispanic, they are more likely to drop out of school.

In the literature review, the same is true of African Americans. If student is from an African American background, their high school dropout behavior tends to be more likely. Accordingly, I assume by the same reasoning.

Hypothesis 13: If the students are African American, they are more likely to drop out of school.

Chapter Summary

This chapter provided a review of literature needed for this study, the factors that are responsible for school dropout and the effect of high stakes testing policy on the high school dropout.

There are many factors revealed by previous studies. The writer used Rumberger's theoretical framework for this study (Rumberger, 2001). Also, the writer explored previous literature on the effect of high stakes testing policy on high school dropouts. There are 2 different views about the relationship between the high stakes testing policy and high school dropouts. One has a positive view of high stakes testing policy and another has the negative view about the policy. There seems to be a no clear view about the effect.

Finally, the writer presented 13 hypotheses for this study based on the Rumberger's theoretical framework and the previous studies on the high stakes testing policy. Figure 1 depicts the conceptual framework. There are 4 variables dealing with individual factors, which are attendance rate, pregnancy, race, and school transfer. Eight variables are in institutional factors. Within the institutional factors, there are 3 categories; family, school, and community. The family factors are educational attainment of parents and household income. The school factors are expenditure on student, school size, student/teacher ratio, and high stakes testing policy. The community factors are unemployment rate and poverty rate.

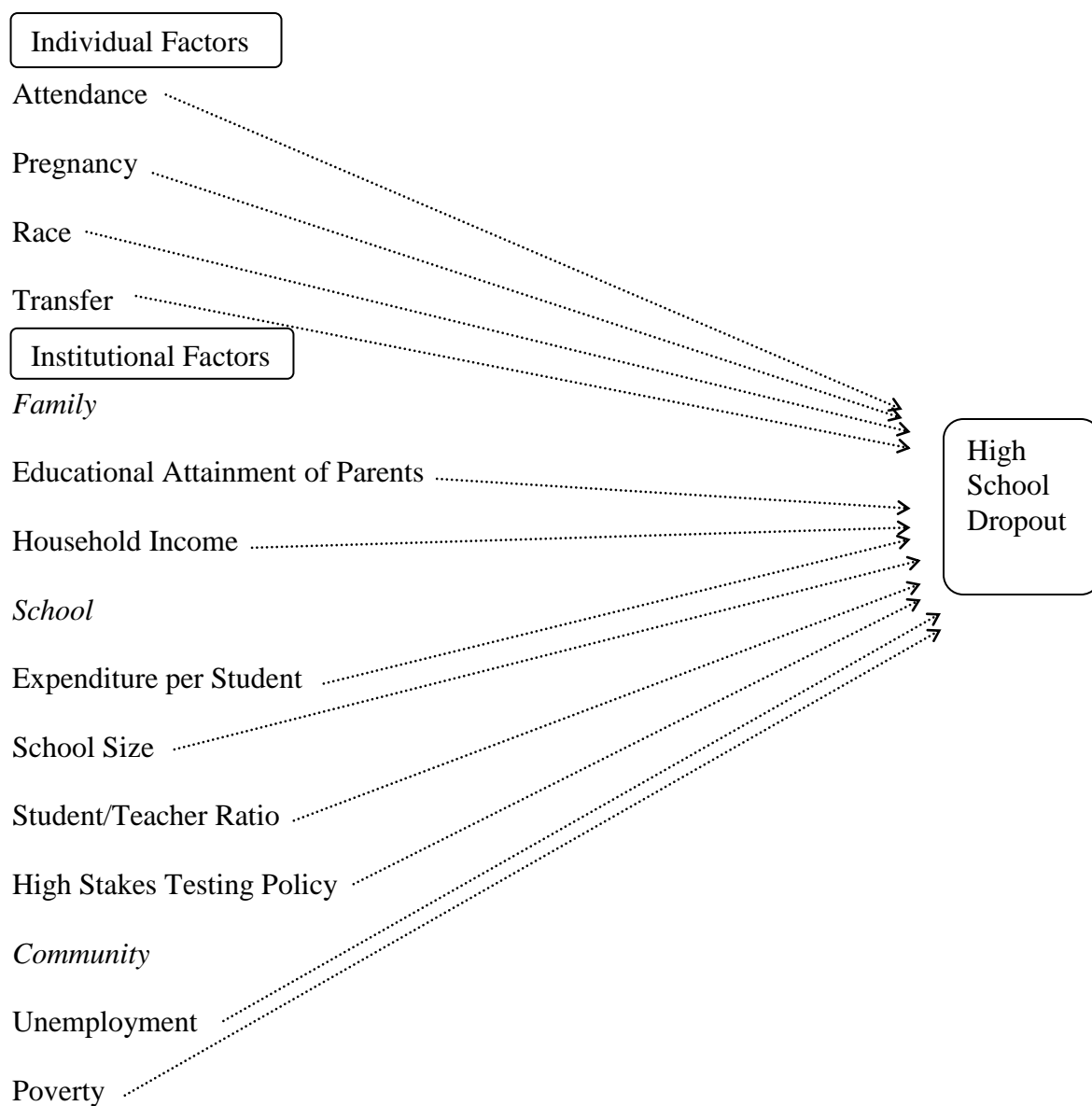


Figure 1

Conceptual Framework

Chapter III. METHODOLOGY

Introduction

In this analysis, the writer intends to find out what is responsible for the high school dropout rate by adopting panel data analysis by state in the United States. The dependent variable is the high school dropout rate, 9th – 12th grade, for each state. Independent variables are program (high stakes testing policy), poverty rate, unemployment rate, educational attainment of 25 and over, student/teacher ratio, expenditure per student, household income, school size, population change, attendance rate, pregnancy rate, and racial composition (% of each minority group) of each state. Also, by dummy coding the variable, high stakes testing policy, this study intends to see the impact of the high stakes testing policy on high school dropouts. The writer uses the aggregated data by state (16 years), from 1991 to 2006.

Selection of Target Population

In this study, the unit of analysis is the states and the unit of observation is the high school students in public schools. Therefore, the writer used state level data on high school students in public schools.

Measurement and Data

The data period for this study is from 1991 to 2006. Data sources and the collection method are described below. Unless specified, all the school-related data is for the public schools.

Dropout Rates

In this study, the dropout rate is the dependent variable, which measures what portion of high school students drop out of high school each year. Dropout rates were obtained from the National Center for Education Statistics (NCES), and Common Core of Data (CCD). *Local Education Agency (School District) Universe Survey Dropout and Completion Data* provides the high school dropout rate (grade 9 – 12) by state.

For these data, event dropout rate is defined that the rate of students who leave school during a defined period of time, in this case, a calendar year. The dropout count is taken on October 1 of a year, or the school day closest to this date. The defining decision is whether or not a student is a dropout on October 1. A student who missed much of the previous school year but who is in membership on October 1 is not a dropout, while a student who is not in membership on the date, October 1, but who returns later in that school year is a dropout. The CCD computes a dropout rate by dividing the number of dropouts for a year by the membership count taken at the beginning of that year (NCES, n.d.). For this study, all the available data, years from 1991 to 2006 for 50 states, were used.

Following data are missing:

- Alabama (1991 and 1992)
- Alaska (1991 to 1994)
- Arizona (1999)
- California (1991 to 1992 and 1996 to 2001)
- Colorado (1991 to 1996 and 1998 to 2001)
- Connecticut (1991)

- Delaware (1991)
- Florida (1991 to 1999)
- Georgia (1991 and 1992)
- Hawaii (1991 to 1992 and 1996 to 1997)
- Idaho (1991 and 1992)
- Illinois (1991 and 1992)
- Indiana (1991 to 1993, and 1996 to 2000)
- Iowa (1991 and 1992)
- Kansas (1991 to 1992, 1996, and 1998 to 1999)
- Kentucky (1991 to 1996)
- Louisiana (1991 and 1992)
- Maine (1991 and 1992)
- Maryland (1991 and 1992)
- Massachusetts (2001)
- Michigan (1991 to 2001)
- Minnesota (1991 and 1992)
- Montana (1991 to 1994)
- New Hampshire (1991 to 1999)
- New Jersey (1991 and 1992)
- New York (1991 to 1992 and 1996 to 1997)
- North Carolina (1991 to 1999 and 2005)
- North Dakota (1991)
- Ohio (1991 to 1992 and 2000)

- Oklahoma (1991 to 1992)
- Oregon (1996 to 1997 and 2003 to 2004)
- Pennsylvania (2006)
- South Carolina (1991 to 1994, 1996 to 1999, and 2005)
- South Dakota (1991 to 1992)
- Tennessee (1991 to 1992)
- Texas (1991 to 1992 and 1995 to 1998)
- Utah (1991 to 1992)
- Vermont (1991 to 1992 and 2005 to 2006)
- Virginia (1991 and 1992)
- Washington (1991 to 2000)
- West Virginia (1991 and 1992)
- Wisconsin (1991 to 1992 and 2003)
- Wyoming (1991 to 1992)

Program

In this study, the program variable is the main independent variable used to measure whether or not the high stakes testing policy exists in a state or not. Above mentioned, the Center on Education Policy (CEP) publishes a report on high stakes testing for high school students annually, *State High School Exit Exams: Trends in Test Programs, Alternate Pathways, and Pass Rates*. This report provides when each state started and will start the high school exit examination. In addition, this report gives a description of the high stake testing of the states.

According to this report, as of 2009, 24 states had adopted the testing policy and 26 states had not. Two of the 26 states are planning to adopt the policy. In this study, the writer used the year diplomas were first withheld due to the high stakes testing policy.

CEP conducted a detailed survey of the 26 states with current or planned high school exit exams. Then, they interviewed officials in Maryland, New Jersey, and Washington State who were familiar with the state high school exit exams, reviewed major research conducted by others on exit exams, and followed up important events related to exit exams.

CEP (2009) provides a detailed data collection method:

As in previous years of this study, CEP designed and conducted an annual survey of state department of education officials in the 26 states with current or planned exit exams. The survey was piloted with Maryland and was revised further based on comments and suggestions from that state. Respondents were designated by their state's chief state school officer and usually worked in the state assessment department. CEP staff partially filled in the survey, based on information collected and reported in 2008. In February 2009 we asked these designated officials to verify, update, and add information to survey forms for their state. All 26 states responded to our survey. We used the states' survey responses to develop detailed profiles about exit exams in each of the 26 states, which the state contacts reviewed for accuracy. We also used the survey responses to tally the state exam features, policies, and actions that appear throughout the report. The state profiles are available on CEP's Web site at www.cep-dc.org. Some states did not answer all the survey questions, often because the data were unavailable or their policies were in flux. (Exam policies are in flux for several reasons, but a main one is that state legislatures are under continuing and significant political pressure to moderate or ameliorate the effects of these exams.) In many states, we followed up with e-mails and phone calls to ensure the information in this report was accurate and up-to-date. However, some statistics or policies will undoubtedly have changed soon after publication because events in this field move quickly. To further understand how exit exam policies evolve, we conducted open-ended, semi-structured interviews with officials in Maryland, New Jersey, and Washington State. These three states were chosen because of their different designs of alternate pathways, the recent public discussions about their exit exams, and the volatility of high school assessment policies in these states. Interviews were recorded, transcribed, verified by the interviewees, coded, and analyzed for themes. In addition, we collected state and federal policy documents and reviewed relevant studies that were either published or publicized

during the past year. We tracked media coverage of exit exams and searched state and U.S. Department of Education Web sites for exit exam developments and information. To be included in this study, state exit exams had to meet the following criteria: 1. The state requires students to pass state exit exams to receive a high school diploma, even if the students have completed the necessary course work with satisfactory grades. 2. The exit exams are a state mandate rather than a local option—in other words, the state requires students in all local school districts to pass exit exams, rather than allowing districts to decide for themselves whether to make the exams a condition of graduation. We have also included states that are phasing in exit exam policies that meet these criteria, referred to in this report as “planned” exit exams. By this we mean that the state has a legislative or state board directive to have a test in place between 2002 and 2012; has already begun developing the tests; and is piloting the tests with students, although diplomas are not yet being withheld. (p. 10)

In this study, the writer included 20 states in the experimental group instead of 26 states, since the data period was between 1991 and 2006. Six states implemented or planned implement after the high stakes testing policy after the year of 2006. The names of the states in both experimental group and control group will be presented in the later chapter.

Poverty

In this study, the poverty rate is an independent variable that controls for the socioeconomic background of the community where high school students reside. This variable measures what portion of population is in poverty in a community. Poverty rates were obtained from Southern Regional Education Board (SREB). *Poverty Rates in the Population and Among Children* provides the poverty rates for 50 states, years from 1980 to 2008. This number is based on the whole population in the 50 states. Poverty rate is the percentage of people who are below poverty level. According to SREB, these data were originally from U.S. Census Bureau (2010) and the poverty was defined as follows:

The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is

considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps).

In this study, the writer used the poverty rate of the years between 1991 and 2006.

Unemployment

In this study, the unemployment rate is an independent variable that controls for the socioeconomic background of each state. This variable measures what portion of population is unemployed in each state. Unemployment rates were obtained from Southern Regional Education Board (SREB). *Employment and Unemployment in the Civilian Labor Force* provides the unemployment rates for 50 states, the years between 1976 and 2009. This number represents the percentage of unemployed population of the 50 states. The writer used the rates, the years between 1991 and 2006. According to SREB, these data were originally from U.S. Bureau of Labor Statistics. U.S. Bureau of Labor Statistics (2010) defines the unemployment rate as follows:

Persons are classified as unemployed if they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work. Persons who were not working and were waiting to be recalled to a job from which they had been temporarily laid off are also included as unemployed. Receiving benefits from the Unemployment Insurance (UI) program has no bearing on whether a person is classified as unemployed.

Educational Attainment

In this study, educational attainment is an independent variable that controls for the educational background of parents of high school students in each state. This variable measures what portion of adult population has high school education or more and, as a proxy variable, this variable measures what portion of parents of high school students have a high school education or more. Educational attainment rates were obtained from

U.S. Census Bureau, Current Population Survey. *Historical Educational Attainment Reports from 1940 through 1998* provides the percentages of the people who are 25 years old and over and have completed 4 years of high school education or more, for the 50 states. The writer used the rate for the years between 1991 and 2006. The rate for the year of 1992 is missing.

U.S. Census Bureau (2010) defines the rate as follows:

Data on educational attainment are derived from a single question that asks, "What is the highest grade of school...has completed, or the highest degree...has received?" The single educational attainment question now in use was introduced in the CPS beginning January 1992, and is similar to that used in the 1990 Decennial Census of Population and Housing. Consequently, data on educational attainment from the 1992 CPS are not directly comparable to CPS data from earlier years. The new question replaces the previous two-part question used in the CPS that asked respondents to report the highest grade they had attended, and whether or not they had completed that grade. The questions on educational attainment apply only to progress in "regular" schools. Such schools include graded public, private, and parochial elementary and high schools (both junior and senior high schools), colleges, universities, and professional schools, whether day schools or night schools. Thus, regular schooling is that which may advance a person toward an elementary school certificate or high school diploma, or a college, university, or professional school degree. Schooling in other than regular schools was counted only if the credits obtained are regarded as transferable to a school in the regular school system.

Student/Teacher ratio

In this study, student/teacher ratio is an independent variable that controls for the size of high school classes. This variable measures how big or small the classes are in terms of number of students based on K-12 students and, and as a proxy variable, this variable measures how big or small the high school classes are in terms of number of students.

Student/teacher ratio was obtained from the National Center for Education Statistics (NCES), Common Core of Data (CCD). *Pupil/Teacher Ratio* provides the number of students per teacher. The total number of students in each state is divided by the total

number of teachers (NCES, 2010). The writer used the ratio for the 50 states for the years between 1991 and 2006.

Expenditure per Student

In this study, expenditure per student is an independent variable that controls for the government spending for education. This variable measures how much money each state allocates to a student based on K-12 students and, as a proxy variable, this variable measures how much money each state allocates to a high school student. Expenditure per student was obtained from the National Center for Education Statistics (NCES), Common Core of Data (CCD). *Total Expenditures per Student* shows how much resource a state spends on a student in dollar. This number is calculated by dividing the total expenditure by the fall membership of students as reported in the state finance file. The total expenditure is the subtotal of direct state support expenditures for private schools, debt service expenditures – interest and total expenditures for education (NCES, 2010). The writer used the ratio for the 50 states for the years between 1991 and 2006. After obtaining the data, the writer divided the data by Gross Domestic Product (GDP) Price Index to control for the inflation within the period of 1991 to 2006. Finally, the writer multiplied the outcome numbers by 1,000.

Household Income

In this study, household income is an independent variable that controls for the economic background of high school students' households in each state. This variable measures how much money each household earns a year on average in each state and as, a proxy variable, this variable measures how much money households of high school students earn. Household income was obtained from Southern Regional Education Board

(SREB). *Median Annual Income of Households* provides the annual household income for 50 states, in the years between 1990 and 2008. The writer used the data, the years between 1991 and 2006. According to SREB, these data were originally from U.S. Census Bureau, Current Population Survey. U.S. Census Bureau (2010) defines the household income as follows:

Household income is the sum of money income received in the calendar year by all household members 15 years old and over, including household members not related to the householder, people living alone, and other nonfamily household members. Included in the total are amounts reported separately for wage or salary income; net self-employment income; interest, dividends, or net rental or royalty income or income from estates and trusts; Social Security or Railroad Retirement income; Supplemental Security Income (SSI); public assistance or welfare payments; retirement, survivor, or disability pensions; and all other income. Since answers to income questions are frequently based on memory and not on records, many people tend to forget minor or sporadic sources of income and, therefore, underreport their income. Underreporting tends to be more pronounced for income sources that are not derived from earnings, such as public assistance, interest, dividends, and net rental income.

After obtaining the data, the writer divided the data by Gross Domestic Product (GDP) Price Index to control for the inflation within the period of 1991 to 2006. Finally, the writer multiplied the outcome numbers by 1,000.

School Size

In this study, school size is an independent variable that controls for the size of high schools. This variable measures how big or small the schools are in terms of number of students based on grades 1-12 students and, as a proxy variable, this variable measures how big or small the high schools are in terms of number of students. School size was obtained from the National Center for Education Statistics (NCES), Common Core of Data (CCD). *Public Elementary/Secondary School Universe Survey Data* provides detailed information on every each public school in the U.S. by state. The writer, first,

extracted grades from 1 to 12 and summed them up by state for each year in the period of 1991 to 2006. Then, the writer divided the outcome numbers by the number of schools within each state to obtain the average school size for each state. Finally, the writer divided the outcome numbers by 10.

According to *Documentation to the NCES Common Core of Data Public Elementary/Secondary School Universe Survey Preliminary File: School Year 2008–09*, this number of student represents “the reported total membership of the school. Membership is the total student enrollment on October 1, or the school day closest to October 1, for a school year” (National Center for Education Statistics, 2009, p.8).

The writer, finally, divided the numbers by 10. The writer used the data, the years between 1991 and 2006.

Population Change

In this study, population change is an independent variable that controls for the students’ transfer. This variable measures what portion of population in a state moved out or moved in and, as a proxy variable, this variable measures what portion of high school students transferred from one school to another. Population change was obtained from Southern Regional Education Board (SREB). *Total Population and Changes* provides the total numbers of residents by state, years between 1930 and 2030 (estimated). The writer divided the number of population for a year by the number of the population for the previous year to find the difference between those two years in terms of the population for every each year between 1991 and 2006 for the 50 states. Finally, the writer subtracted 1 from the each outcome number to find the difference in percentage.

Attendance Rate

In this study, attendance rate is an independent variable that controls for the high school students' attendance. This variable measures the school students' attendance behavior and engagement based on K-12 students and, as a proxy variable, this variable measures the high school students' attendance behavior and engagement. To obtain the attendance rate in percentage, the writer used two data sets: a total number of enrolled students and an average number of students who attended schools daily. The data came from the National Center for Education Statistics (NCES), Common Core of Data (CCD). The total number of enrolled students includes all the enrolled students in each year for each state for the period of 1991 to 2006 (*Total Students*). The average number of students who attended schools daily includes the average number of students who attended schools in each year for each state in the period of 1991 to 2006 (*Average Daily Attendance*). The writer then divided the Average Daily Attendance by the Total Students to obtain the rate.

Pregnancy Rate

In this study, pregnancy rate is an independent variable that controls for the high school age pregnancy. This variable measures what portion of high school age population became pregnant and, as a proxy variable, what portion of high school student became pregnant. To obtain the pregnancy rate in percentage, the writer used two data sets; a total number of people who are 15 to 17 years old in each year for each state for the period of 1991 to 2006 and a total number of mothers who are 15 to 17 years old in each year for each state for the period of 1991 to 2006. The former was obtained from the U.S. Census Bureau; the latter was obtained from the Centers for Disease Control and Prevention

(CDC). *State Single Year of Age and Sex Population Estimates*, by the U.S. Census Bureau, provides the number of people by age and state. *Characteristics of Mother by State*, by the CDC, provides the number of mother by age and state.

The writer then summed up the 3 years of age groups for each category; the number of people by age and state, and the number of mothers by age and state. Finally, the writer divided the number of mothers by age by the number of people by age for each state to obtain the pregnancy rate for each state for the period of 1991 to 2006.

Race

In this study, race is an independent variable that controls for the high school students' difference in race. This variable measures the percentage of students by race based on grades 1-12 students and, as a proxy variable, what portion of high school students belong to what race group. Racial composition was obtained from the National Center for Education Statistics (NCES), Common Core of Data (CCD). *Public Elementary/Secondary School Universe Survey Data* provides detailed information on every each public school in the U.S. by state, including students' racial background. The writer, first, extracted grades from 1 to 12 and summed them up by state for each year in the period of 1991 to 2006. Then, the writer divided the number of each racial group by the total number of students to obtain the percentage of each race group: White, Black, Hispanic, Asian, and Native American by state for each year in the period of 1991 to 2006.

Gross Domestic Product (GDP) Price Index

In this study, the GDP Price Index is used to control for inflation over the years. GDP Price Index was obtained from the U.S. Government Printing Office (GPO). *Gross*

Table 2

Measurements for the Dependent and Independent Variables

| Variables | Operational Definitions | Data Source |
|---------------------------|--|---|
| <i>Dependent Variable</i> | | |
| Dropout Rate | Annual event high school dropout rate by state. | National Center for Education Statistics (NCES) |
| <i>Individual Factors</i> | | |
| Attendance Rate | Proxy variable for annual attendance rate of high school students by state obtained by dividing an average number of students who attended schools daily by a total number of enrolled students. (Grades K-12) | National Center for Education Statistics (NCES) |
| Pregnancy Rate | Proxy variable for annual pregnancy rate of high school students by state obtained by dividing a total number of people who are 15 to 17 years old in each year for each state by a total number of mothers who are 15 to 17 years old in each year for each state. | Centers for Disease Control and Prevention (CDC) US Census |
| Race | Proxy variable for composition rates of race groups by state. Rate of racial composition of students by race and state. (Grades K-12) | National Center for Education Statistics (NCES) |
| Population Change | Proxy variable for annual high school student transfer rate by state obtained by dividing the number of population for a year in a state by the number of the population for the previous year in a state to find the difference between those two years and subtracted 1 from the each outcome number to find the difference in percentage. | Southern Regional Education Board (SREB) |

(table con'd.)

Institutional Factors

Family Variables

| | | |
|------------------------|---|--|
| Educational Attainment | Proxy variable for a rate of parents of high school students who obtained high school diploma and more by state. The percentage of adult population, 25 and over, who completed high school or more by state. | US Census |
| Household Income | Proxy variable for annual household income for high school students in dollar by state. Annual household income by state divided by GDP Index to control for the inflation. | Southern Regional Education Board (SREB) |

School Variables

| | | |
|-------------------------|---|---|
| Expenditure per Student | Proxy variable for annual expenditure per high school student in dollar by state obtained by dividing the total expenditure by the fall membership of students as reported in the state finance file and divided by GDP Index to control for the inflation. (Grades K-12) | National Center for Education Statistics (NCES) |
| School Size | Proxy variable for average high school size in student number by state obtained by dividing the total number of students by the number of schools within each state to obtain the average school size in student number for each state. (Grades 1-12) | National Center for Education Statistics (NCES) |
| Student/Teacher Ratio | Proxy variable for average student/teacher ratio by state obtained by dividing the total number of students in each state by the total number of teachers. (Grades K-12) | National Center for Education Statistics (NCES) |

(table con'd.)

| | | |
|---------------------|---|--|
| Program | Dummy variable indicating whether or not a state has the high stakes testing policy; coded as 1 for existence of high stakes testing policy, and 0 otherwise. | Center on Education Policy (CEP) |
| Community Variables | | |
| Unemployment Rate | Annual unemployment rate by state. | Southern Regional Education Board (SREB) |
| Poverty Rate | Annual poverty rate by state. | Southern Regional Education Board (SREB) |

Domestic Product and Deflators Used in the Historical Tables: 1940–2013 provides the GDP Price Index for the years from 1940 to 2013 (estimate). The base year is the year of 2000 (Fiscal year 2000 = 1.000). The writer used this index to control the inflation for the variables, Expenditure per Student and Household Income.

Table 2 summarizes the measurements for the dependent and independent variables with the operational definitions.

Method of Data Analysis

In this research, the writer tested the association between the high school dropout rate, as dependent variable, and program, poverty rate, unemployment rate, educational attainment of 25 and over, student/teacher ratio, expenditure per student, household income, school size, population change, attendance rate, pregnancy rate, and racial composition (% of each minority group) as independent variables. The writer used panel

data analysis to test the association of those variables.

In this study, the writer used a panel data on 50 states, years between 1991 and 2006, obtained from multiple sources (secondary data). Also, the writer used feasible generalized least square (FGLS) estimates due to the heteroscedasticity, where the variances of residual of observations are not constant, and serial correlation, where the residuals of different years are correlated. In addition, the writer used the difference in differences estimator to estimate the effect of the high stakes testing policy. Also, the writer used some proxy variables to have a better estimation.

Panel Data

A panel data is a data set that consists of repeated cross-sectional data set over time. In other words, the panel data is a combination of a cross-sectional data set and a time series data set. Cross-sectional data is the data obtained from different sections at a time. Time series data is the data obtained from one individual for certain period of time.

In this study, the cross-sectional units are the states and the time period is from 1991 to 2006.

Panel data is more informative than one-time cross sectional analysis, since there is more variability, less collinearity, and more degrees of freedom, so that estimates are more efficient. The advantage of the panel data analysis is that, as Wooldridge (2003) indicates, by having multiple observations of the same units, one can control certain unobserved characteristics of the units. Also, by using more than one observation of the units, instead of using just one year observation on the cross-sectional data set, one can see more easily the causal relationship between the variables the one is looking at.

Feasible Generalized Least Square Estimate (FGLS)

The feasible generalized least square estimate is a linear regression estimator used when there heteroscedasticity and serial correlation exist on panel data analysis. These disturbances could either underestimate or overestimate the coefficients. Boothe and MacKinnon (1986) suggest that if there are errors such as heteroscedasticity and serial correlation coexisting, the regression model should be estimated by generalized least square estimator (GLS), and the GLS is more efficient than an ordinary least square estimator. Likewise, Wooldridge (2003) introduces the feasible GLS with heteroscedasticity and autoregressive order of one (AR1) serial correlation model to deal with these disturbances to have a more efficient estimate. The difference between the GLS and FGLS is that the former uses the real variance-covariance matrix and the latter uses the estimated variance-covariance matrix since the real variance-covariance matrix is unknown. In this study, the writer used this FGLS with heteroscedasticity and AR (1) serial correlation model.

Difference in Differences Estimator

Card and Krueger (1994) introduced the difference in difference estimator in their research on the impact of a minimum wage policy on employment in New Jersey. In 1992, New Jersey raised the minimum wage. They used New Jersey as an experimental group and Pennsylvania as a control group to see the impact of the change of the minimum wage on the employment in the fast food industry. The research revealed that there was no difference on the employment before and after the change of minimum wage. In this research, the writer utilized this estimator to see the impact of the high stakes testing policy on the high school dropout rate.

This estimation requires two groups, an experimental group and a control group. Also, both groups are split into two segments, before the policy implementation and after the policy implementation, respectively. In this research, there are 20 states in the experimental group whereas 30 other states belong to the control group. The years when each state implemented the high stakes testing policy vary from state to state.

The simple idea of the difference in differences is shown below.

Policy effect = (Experimental Group after the policy implementation – (Experimental Group before the policy implementation) – (Control Group after the policy implementation – Control Group before the policy implementation)

Converted into a regression term:

$$Y_{it}(\text{dropout rate}) = \alpha + \beta_1 X(\text{high stakes testing policy})_{it} + \beta_2 X(\text{after the policy implementation})_{it} + \beta_3 X(\text{high stakes testing policy} * \text{after the policy implementation})_{it} + \varepsilon$$

Where α = intercept, ε = error, high stakes testing policy = 1 if in the experimental group and = 0 if in the control group, after the policy implementation = 1 if after the policy implementation and = 0 if before the policy implementation. The coefficient on the interaction term, β_3 gives the policy effect of the difference in differences estimate.

In this research, the writer injected this policy effect into the FGLS estimate equation.

Proxy Variable

In this study, the unit of analysis is the states and the unit of observation is the public high school students. However, the data on the public high school students for some of the variables used in this study were not available. Thus, the writer used the proxy variables, instead. The proxy variable is defined as a variable that is related to the unobservable variable we would include in our analysis. For instance, if we would like to

measure the ability to make money and we do not have the appropriate measurement, we could use IQ instead as a proxy variable, instead of dropping the variable just because it is not available. This could present a threat to the validity of this study. However, Wickens (1972) argues that the bias of the estimates of the coefficients of the observable variables obtained by omitting the unobservable variable is always greater than the bias from the estimates using even a poor proxy variable. Likewise, McCallaum (1972) mathematically proves that although omitting a variable and using a proxy variable gives a biased and inefficient estimate, the bias is smaller when using the proxy variable than omitting the missing variable. In this study, the writer used the following proxy variables: poverty rate of a state instead of poverty rate for the high school students, unemployment rate, educational attainment of 25 and over instead of educational attainment of parents, household income of a state instead of household income of the students, and population change rate of a state instead of transfer rate of the students.

Finally, the equation of FGLS estimate for this study is:

$$\begin{aligned}
 Y_{it} (\%DropoutRate) = & \alpha + \beta_1(Program)_{it} + \beta_2(\%PovertyRate)_{it} + \\
 & \beta_3(\%UnemploymentRate)_{it} + \beta_4it(\%EducationalAttainmentOf25AndOver) + \\
 & \beta_5it(Student/TeacherRatio) + \beta_6(\$Expenditure Per Student)_{it} + \beta_7(\$HouseholdIncome)_{it} \\
 & + \beta_8(SchoolSize)_{it} + \beta_9(\%PopulationChangeRate)_{it} + \beta_{10}(AttendanceRate)_{it} + \\
 & \beta_{11}(\%PregnancyRate)_{it} + \beta_{12}(\%Black)_{it} + \beta_{13}(\%Hispanic)_{it} + \beta_{14}(\%Asian)_{it} + \\
 & \beta_{15}(\%NativeAmerican)_{it} + v_i + \epsilon_{it}
 \end{aligned}$$

where *%DropoutRate* is the high school dropout rate of a state, *Program* is a dummy variable coded as 0 for no existence of the program, coded as 1 for the existence of the program. *%PovertyRate* is the poverty rate of a state, *%UnemploymentRate* is the

unemployment rate of a state, and *%EducationalAttainmentOf25AndOver* is the rate of adult population who completed high school education or more in a state.

Student/TeacherRatio is the ratio of teachers and students in a state, *\$Expenditure Per Student* is how much money each state spends on a student, and *\$HouseholdIncome* is an average household income in a state. *SchoolSize* is the average school size of a state, *%PopulationChangeRate* is a percentage of population mobility of a state, and *\$AttendanceRate* is an average attendance rate of a state. *%PregnancyRate* is a pregnancy rate of high school age population in a state, *%Black* is a percentage of Black students in a state, and *%Hispanic* is a percentage of Hispanic students in a state. *%Asian* is a percentage of Asian students in a state, and *%NativeAmerican* is a percentage of Native American students in a state. i is a state id coded 1 – 50, t is a year id coded 1991 - 2006, respectively, v_i is unobservable characteristics of observations' error or individual-specific effect, and ϵ_{it} is observable error of observations across the individual and time.

Chapter Summary

This chapter provided the target population, measurement, data, and the quantitative methodology for this study. The unit of analysis is the state and the unit of observation is a high school student; hence, this study is looking at the population of high school students by state. For this study, the writer used the high school dropout rate as dependent variable, and program, poverty rate, unemployment rate, educational attainment of 25 and over, student/teacher ratio, expenditure per student, household income, school size, population change, attendance rate, pregnancy rate, and racial composition (% of each minority group) as independent variables. Using these data, the writer used panel data on 50 states, the years between 1991 and 2006, obtained from multiple sources (secondary

data). Also, the writer used a feasible generalized least square (FGLS) estimate, due to the heteroscedasticity and serial correlation. In addition, to estimate the effect of the high stakes testing policy, the writer used the difference in differences estimator. Also, the writer used some proxy variables to have a better estimation.

Chapter IV. RESULTS AND DISCUSSION

Introduction

The purpose of this study is to lay out the factors that are responsible for the high school dropout rate and explore the effects of the adoption of high stakes testing policy on high school dropouts. Therefore, in this chapter, the writer presents a quantitative analysis of the data to test the following hypotheses: Hypothesis 1: If a state adopts high stakes testing policy, high school students are more likely to drop out of the schools; Hypothesis 2: If the poverty rate is high, high school students are more likely to drop out of the schools; Hypothesis 3: If the unemployment rate is high, high school students are less likely to drop out of the schools; Hypothesis 4: If the parents' education is low, high school students are more likely to drop out of the schools; Hypothesis 5: If the student/teacher ratio is high, high school students are more likely to drop out of the schools; Hypothesis 6: If the expenditure on school is low, high school students are more likely to drop out of the schools; Hypothesis 7: If the student's household income is low, high school students are more likely to drop out of the schools; Hypothesis 8: If the school size is large, high school students are more likely to drop out of the schools; Hypothesis 9: If the student's mobility is high, high school students are more likely to drop out of the schools; Hypothesis 10: If the attendance rate is low, high school students are more likely to drop out of the schools; Hypothesis 11: If the pregnancy rate is high, high school students are more likely to drop out of the schools; Hypothesis 12: If the students are Hispanic, high school students are more likely to drop out of the schools; Hypothesis 13: If the students are African American, high school students are more likely

to drop out of the schools.

The quantitative analysis consists of two phases. In the first phase, the writer conducted a descriptive analysis and, in the second phase, the writer conducted a panel data analysis. Discussion of the findings will follow the analysis.

Descriptive Analyses

Table 3 lists the states which belong to experimental and control groups in this study. There are 20 states in the experimental group which have the high stakes testing policy for high school. Thirty states belong to the control group, which do not have the high states testing policy as of 2006. Again, Arkansas, Maryland, Minnesota, Ohio, Oklahoma, and Washington plan to adopt the high states testing policy for high school after 2006.

Table 4 shows the mean value of the event high school dropout rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 4.62 with a standard deviation of 1.45. Arizona has the highest rate of 9.37 and North Dakota has the lowest rate of 2.35. The rates for Arizona, Louisiana, Nevada, Georgia, Alaska, New Mexico, and Colorado are more than 1 standard deviation from the mean value. On the other hand, North Dakota, Wisconsin, Iowa, New Jersey, and Indiana have the rates which are less than 1 standard deviation from the mean value.

Table 5 provides the regional classification used by the U.S. Census. There are 4 regions in this classification. Nine states belong to the Northeast, which are Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Sixteen states belong to the South, which are Alabama, Arkansas, Delaware, Florida Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina,

Table 3

Control and Experimental Groups as of 2006

| Experimental Group (<i>N</i> =20) | Year First Withheld | Control Group (<i>N</i> =30) | Year to be Withheld |
|---------------------------------------|---------------------|----------------------------------|---------------------|
| Alabama | 2001 | Arkansas | 2010 |
| Alaska | 2004 | Colorado | |
| Arizona | 2006 | Connecticut | |
| California | 2006 | Delaware | |
| Florida | 2003 | Hawaii | |
| Georgia | 1994 | Illinois | |
| Idaho | 2006 | Iowa | |
| Indiana | 2000 | Kansas | |
| Louisiana | 2003 | Kentucky | |
| Massachusetts | 2003 | Maine | |
| Mississippi | 2006 | Maryland | 2009 |
| Nevada | 2003 | Michigan | |
| New Jersey | 2003 | Minnesota | 2010 |
| New Mexico | 1990 | Missouri | |
| New York | 2000 | Montana | |
| North Carolina | 1981 | Nebraska | |
| South Carolina | 2006 | New Hampshire | |
| Tennessee | 2005 | North Dakota | |
| Texas | 2005 | Ohio | 2007 |
| Virginia | 2004 | Oklahoma | 2010 |
| | | Oregon | |
| | | Pennsylvania | |
| | | Rhode Island | |
| | | South Dakota | |
| | | Utah | |
| | | Vermont | |
| | | Washington | 2008 |
| | | West Virginia | |
| | | Wisconsin | |
| | | Wyoming | |

Table 4

Event High School Dropout Rate (mean) by state, between 1991 and 2006

| State | Dropout Rate | State | Dropout Rate |
|----------------|--------------|----------------|--------------|
| Arizona | 9.37 | Minnesota | 4.29 |
| Louisiana | 8.29 | Alabama | 4.20 |
| Nevada | 7.62 | South Dakota | 4.20 |
| Georgia | 6.90 | Montana | 4.14 |
| Alaska | 6.69 | West Virginia | 4.07 |
| New Mexico | 6.48 | Tennessee | 4.06 |
| Colorado | 6.20 | California | 4.05 |
| Washington | 5.83 | Kentucky | 4.01 |
| Illinois | 5.83 | Utah | 3.91 |
| Oregon | 5.77 | Texas | 3.84 |
| Wyoming | 5.66 | Nebraska | 3.77 |
| North Carolina | 5.55 | Florida | 3.76 |
| Idaho | 5.27 | Virginia | 3.75 |
| Hawaii | 5.03 | New Hampshire | 3.71 |
| Missouri | 4.94 | Pennsylvania | 3.56 |
| Delaware | 4.91 | Massachusetts | 3.54 |
| Arkansas | 4.83 | Maine | 3.39 |
| Mississippi | 4.79 | Kansas | 3.37 |
| Michigan | 4.78 | South Carolina | 3.33 |
| New York | 4.77 | Connecticut | 3.24 |
| Oklahoma | 4.75 | Indiana | 2.90 |
| Rhode Island | 4.57 | New Jersey | 2.89 |
| Vermont | 4.32 | Iowa | 2.66 |
| Ohio | 4.32 | Wisconsin | 2.44 |
| Maryland | 4.30 | North Dakota | 2.35 |

Table 5

Regional Classification

| Northeast | South | Midwest | West |
|---------------|----------------|--------------|------------|
| Connecticut | Alabama | Illinois | Alaska |
| Maine | Arkansas | Indiana | Arizona |
| Massachusetts | Delaware | Iowa | California |
| New Hampshire | Florida | Kansas | Colorado |
| New Jersey | Georgia | Michigan | Hawaii |
| New York | Kentucky | Minnesota | Idaho |
| Pennsylvania | Louisiana | Missouri | Montana |
| Rhode Island | Maryland | Nebraska | Nevada |
| Vermont | Mississippi | North Dakota | New Mexico |
| | North Carolina | Ohio | Oregon |
| | Oklahoma | South Dakota | Utah |
| | South Carolina | Wisconsin | Washington |
| | Tennessee | | Wyoming |
| | Texas | | |
| | Virginia | | |
| | West Virginia | | |

Note. U.S. Census Bureau, Regional Classification (2010).
<http://nces.ed.gov/programs/coe/2007/supnotes/n01.asp>

Table 6

Dropout Rate by Region

| Region | Dropout Rate |
|------------|--------------|
| West | 5.98 |
| South | 4.79 |
| Mid West | 3.82 |
| North East | 3.76 |

Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Twelve states belong to the Midwest, which are Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Thirteen states belong to the West, which are Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Table 6 provides the event dropout rate by region between the years 1991 and 2006. The states were classified in accordance with the classification by the U.S. Census Bureau which is presented in the Table 5. The Table 6 tells us that West region has the highest dropout rate followed by South, Mid West, and North East.

Table 7 shows the mean value of the poverty rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 12.38, with a standard deviation of 3.14. New Mexico has the highest rate of 19.91 and New Hampshire has the lowest rate of 6.93. The rates for New Mexico, Mississippi, Louisiana, West Virginia, Arkansas, Texas, Alabama, and Kentucky are more than 1 standard deviation above the mean value. On the other hand, New Hampshire, New Jersey, Delaware, Maryland, Connecticut, Alaska, Minnesota, and Utah have the rates which are more than 1 standard deviation below the mean value.

Table 8 shows the mean value of the unemployment rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 5.11 with a standard deviation of 0.93. Alaska has the highest rate of 7.14 and Nebraska has the lowest rate of 3.02. The rates for Alaska, West Virginia, California, Mississippi, Oregon, New York, New Mexico, Michigan, and Louisiana are more than 1 standard deviation above the mean value. On the other hand, Nebraska, South Dakota, North

Table 7

Poverty Rate by State, between 1991 and 2006

| State | Poverty Rate | State | Poverty Rate |
|----------------|--------------|---------------|--------------|
| New Mexico | 19.91 | Ohio | 11.79 |
| Mississippi | 19.72 | Maine | 11.61 |
| Louisiana | 19.40 | Kansas | 11.29 |
| West Virginia | 17.27 | Rhode Island | 11.04 |
| Arkansas | 16.86 | Pennsylvania | 11.02 |
| Texas | 16.59 | Wyoming | 10.72 |
| Alabama | 16.00 | Washington | 10.71 |
| Kentucky | 15.86 | Indiana | 10.39 |
| Oklahoma | 15.31 | Massachusetts | 10.37 |
| New York | 15.31 | Nevada | 10.36 |
| Arizona | 15.11 | Hawaii | 10.06 |
| Tennessee | 14.99 | Nebraska | 9.98 |
| California | 14.87 | Iowa | 9.77 |
| South Carolina | 14.60 | Virginia | 9.69 |
| Montana | 14.59 | Colorado | 9.66 |
| North Carolina | 13.71 | Vermont | 9.61 |
| Georgia | 13.64 | Wisconsin | 9.60 |
| Florida | 13.57 | Utah | 9.15 |
| South Dakota | 12.40 | Minnesota | 9.11 |
| Idaho | 12.32 | Alaska | 9.06 |
| Michigan | 12.03 | Connecticut | 8.95 |
| Oregon | 12.03 | Maryland | 8.95 |
| Illinois | 11.96 | Delaware | 8.88 |
| North Dakota | 11.93 | New Jersey | 8.64 |
| Missouri | 11.82 | New Hampshire | 6.93 |

Table 8

Unemployment Rate by State, between 1991 and 2006

| State | Unemployment Rate | State | Unemployment Rate |
|----------------|-------------------|----------------|-------------------|
| Alaska | 7.14 | Idaho | 5.05 |
| West Virginia | 7.08 | Montana | 5.03 |
| California | 6.78 | Alabama | 5.00 |
| Mississippi | 6.60 | North Carolina | 4.95 |
| Oregon | 6.21 | Missouri | 4.93 |
| New York | 6.14 | Connecticut | 4.79 |
| New Mexico | 6.11 | Georgia | 4.76 |
| Michigan | 6.09 | Oklahoma | 4.74 |
| Louisiana | 6.06 | Maryland | 4.72 |
| Washington | 6.02 | Wyoming | 4.58 |
| Texas | 5.88 | Kansas | 4.55 |
| Illinois | 5.77 | Colorado | 4.53 |
| Rhode Island | 5.72 | Indiana | 4.49 |
| Kentucky | 5.69 | Wisconsin | 4.36 |
| New Jersey | 5.66 | Hawaii | 4.31 |
| South Carolina | 5.62 | New Hampshire | 4.28 |
| Pennsylvania | 5.54 | Vermont | 4.19 |
| Ohio | 5.44 | Utah | 4.17 |
| Arkansas | 5.37 | Delaware | 4.16 |
| Florida | 5.35 | Minnesota | 4.06 |
| Tennessee | 5.29 | Virginia | 4.00 |
| Massachusetts | 5.27 | Iowa | 3.76 |
| Nevada | 5.25 | North Dakota | 3.48 |
| Arizona | 5.24 | South Dakota | 3.29 |
| Maine | 5.17 | Nebraska | 3.02 |

Dakota, Iowa, Virginia, Minnesota, Delaware, and Utah have the rates which are more than 1 standard deviation below the mean value.

Table 9 shows the mean value of the educational attainment of 25 and over rate (high school or more) for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 83.78 (%), with a standard deviation of 4.17. West Virginia has the lowest rate of 75.95 and Alaska has the highest rate of 90.63. The rates for West Virginia, Mississippi, Louisiana, Kentucky, Alabama, Tennessee, Texas, Arkansas, South Carolina, North Carolina, and Rhode Island are more than 1 standard deviation below the mean value. On the other hand, Alaska, Utah, Wyoming, Minnesota, Washington, Colorado, Nebraska, and Montana have the rates which are more than 1 standard deviation above the mean value.

Table 10 shows the mean value of the student/teacher ratio for each state for the years from 1991 to 2006. The mean value of these ratios across the 50 states for the 16 years is 16.09, with a standard deviation of 2.19. Utah has the highest ratio of 23.02 and Vermont has the lowest ratio of 12.54. The rates for Utah, California, Arizona, Washington, Oregon, Nevada, Michigan, and Idaho are more than 1 standard deviation above the mean value. On the other hand, Vermont, Maine, New Jersey, and Virginia have the ratios which are more than 1 standard deviation below the mean value.

Table 11 shows the mean value of the real expenditure per student for each state for the years from 1991 to 2006. The mean value of these amounts across the 50 states for the 16 years is 7961.75, with a standard deviation of 1567.58. Utah has the lowest amount of 5310.53 and New Jersey has the highest amount of 12437.04. The amounts for Utah, Mississippi, Idaho, Oklahoma, Tennessee, Alabama, and Arkansas are more than 1

Table 9

Educational Attainment of 25 and over (High School or more) (%) by State,
between 1991 and 2006

| State | Educational Attainment Rate | State | Educational Attainment Rate |
|----------------|--------------------------------|---------------|--------------------------------|
| West Virginia | 75.95 | Maryland | 84.85 |
| Mississippi | 76.86 | Michigan | 85.01 |
| Louisiana | 76.95 | New Jersey | 85.11 |
| Kentucky | 76.95 | Nevada | 85.15 |
| Alabama | 77.36 | Ohio | 85.17 |
| Tennessee | 77.53 | Idaho | 85.45 |
| Texas | 77.59 | South Dakota | 85.55 |
| Arkansas | 77.61 | Massachusetts | 85.88 |
| South Carolina | 77.80 | Connecticut | 85.95 |
| North Carolina | 78.59 | Maine | 86.19 |
| Rhode Island | 79.18 | Oregon | 86.35 |
| California | 79.85 | Hawaii | 86.51 |
| Georgia | 80.08 | Wisconsin | 86.74 |
| New Mexico | 80.13 | Iowa | 87.07 |
| New York | 82.16 | Vermont | 87.37 |
| Florida | 82.54 | New Hampshire | 87.63 |
| Indiana | 83.00 | Kansas | 87.77 |
| Arizona | 83.17 | Montana | 88.17 |
| Oklahoma | 83.25 | Nebraska | 88.49 |
| Virginia | 83.53 | Colorado | 88.77 |
| Pennsylvania | 83.64 | Washington | 89.51 |
| Illinois | 83.78 | Minnesota | 89.59 |
| Missouri | 83.91 | Wyoming | 89.69 |
| Delaware | 84.34 | Utah | 89.86 |
| North Dakota | 84.83 | Alaska | 90.63 |

Table 10

Student/Teacher Ratio by State, between 1991 and 2006

| State | Ratio | State | Ratio |
|--------------|-------|----------------|-------|
| Utah | 23.02 | Arkansas | 15.63 |
| California | 21.92 | Alabama | 15.62 |
| Arizona | 19.91 | North Carolina | 15.59 |
| Washington | 19.78 | South Carolina | 15.51 |
| Oregon | 19.69 | Oklahoma | 15.43 |
| Nevada | 18.76 | Texas | 15.26 |
| Michigan | 18.68 | Montana | 15.26 |
| Idaho | 18.49 | Wisconsin | 15.09 |
| Florida | 18.10 | Iowa | 14.77 |
| Colorado | 17.62 | New Hampshire | 14.70 |
| Hawaii | 17.22 | Missouri | 14.66 |
| Indiana | 17.13 | Kansas | 14.60 |
| Alaska | 17.04 | West Virginia | 14.38 |
| Tennessee | 16.69 | New York | 14.32 |
| Minnesota | 16.58 | South Dakota | 14.26 |
| Mississippi | 16.56 | Connecticut | 14.16 |
| Kentucky | 16.51 | Wyoming | 14.08 |
| Illinois | 16.43 | Nebraska | 14.04 |
| Maryland | 16.38 | Massachusetts | 14.03 |
| Ohio | 16.16 | North Dakota | 14.02 |
| New Mexico | 16.13 | Rhode Island | 13.97 |
| Pennsylvania | 16.12 | Virginia | 13.89 |
| Georgia | 16.06 | New Jersey | 13.27 |
| Delaware | 15.89 | Maine | 12.92 |
| Louisiana | 15.70 | Vermont | 12.54 |

Table 11

Real Expenditure per Student by State, between 1991 and 2006

| State | Expenditure | State | Expenditure |
|----------------|-------------|---------------|-------------|
| Utah | 5310.53 | West Virginia | 7753.19 |
| Mississippi | 5545.75 | Oregon | 7921.42 |
| Idaho | 5903.88 | Nebraska | 7930.94 |
| Oklahoma | 6018.06 | Washington | 7935.46 |
| Tennessee | 6041.08 | Virginia | 7977.40 |
| Alabama | 6276.16 | Hawaii | 8062.49 |
| Arkansas | 6289.79 | New Hampshire | 8139.47 |
| Kentucky | 6457.31 | Illinois | 8241.41 |
| Louisiana | 6529.33 | Indiana | 8272.98 |
| South Dakota | 6543.04 | Ohio | 8388.79 |
| Arizona | 6625.97 | Maine | 8616.41 |
| North Dakota | 6696.26 | Minnesota | 8847.66 |
| North Carolina | 6844.03 | Wyoming | 8906.45 |
| New Mexico | 6952.72 | Maryland | 8987.22 |
| Montana | 7078.31 | Wisconsin | 9188.49 |
| Kansas | 7231.61 | Michigan | 9323.91 |
| South Carolina | 7281.15 | Massachusetts | 9463.43 |
| Missouri | 7306.50 | Rhode Island | 9500.07 |
| Texas | 7355.17 | Vermont | 9506.06 |
| California | 7460.66 | Pennsylvania | 9513.98 |
| Nevada | 7465.02 | Delaware | 9621.25 |
| Iowa | 7481.11 | Alaska | 10866.60 |
| Georgia | 7499.89 | Connecticut | 11299.82 |
| Florida | 7622.76 | New York | 11929.73 |
| Colorado | 7639.96 | New Jersey | 12437.04 |

standard deviation below the mean value. On the other hand, New Jersey, New York, Connecticut, Alaska, and Delaware have the rates which are more than 1 standard deviation above the mean value.

Table 12 shows the mean value of the real household income for each state for the years from 1991 to 2006. The mean value of these amounts across the 50 states for the 16 years is 38973.31, with a standard deviation of 5739.63. West Virginia has the lowest amount of 28482.33 and Alaska has the highest amount of 50954.06. The amounts for West Virginia, Mississippi, Arkansas, Montana, Louisiana, New Mexico, Oklahoma, Alabama, Kentucky, and Tennessee are more than 1 standard deviation below the mean value. On the other hand, Alaska, New Jersey, Maryland, Connecticut, Hawaii, New Hampshire, Minnesota, Massachusetts, and Virginia have the amounts which are more than 1 standard deviation above the mean value.

Table 13 shows the mean value of the school size for each state for the years from 1991 to 2006. The mean value of these numbers across the 50 states for the 16 years is 497.23, with a standard deviation of 160.05. Florida has the largest school size of 870.23 and Montana has the smallest school size of 178.06. The numbers for Florida, California, Georgia, Hawaii, Nevada, New York, Utah, Delaware, and Maryland are more than 1 standard deviation above the mean value. On the other hand, Montana, South Dakota, North Dakota, Nebraska, Wyoming, Alaska, Maine, Vermont, Kansas, and Iowa have the numbers which are more than 1 standard deviation below the mean value.

Table 14 shows the mean value of the population change rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 1.15, with a standard deviation of 0.89. Nevada has the highest rate of 4.69 and

Table 12

Real Household Income by State, between 1991 and 2006

| State | Household Income | State | Household Income |
|----------------|------------------|---------------|------------------|
| West Virginia | 28482.33 | Nebraska | 38503.31 |
| Mississippi | 29082.84 | Ohio | 38657.02 |
| Arkansas | 29544.46 | New York | 38858.91 |
| Montana | 31582.21 | Oregon | 38893.64 |
| Louisiana | 31636.99 | Pennsylvania | 38921.26 |
| New Mexico | 32080.17 | Vermont | 39531.72 |
| Oklahoma | 32297.26 | Rhode Island | 40520.62 |
| Alabama | 32843.95 | Michigan | 41095.06 |
| Kentucky | 33060.91 | Nevada | 41689.05 |
| Tennessee | 33165.80 | Illinois | 41895.53 |
| North Dakota | 33756.73 | Wisconsin | 41944.11 |
| South Dakota | 34535.48 | Washington | 42893.56 |
| South Carolina | 34679.87 | California | 43194.16 |
| Florida | 35137.31 | Utah | 43596.93 |
| North Carolina | 35566.02 | Delaware | 43914.03 |
| Maine | 35977.29 | Colorado | 44692.89 |
| Texas | 36293.20 | Virginia | 45289.79 |
| Idaho | 36579.64 | Massachusetts | 45379.59 |
| Wyoming | 37135.83 | Minnesota | 45531.21 |
| Kansas | 37167.09 | New Hampshire | 47080.11 |
| Arizona | 37233.87 | Hawaii | 47350.65 |
| Indiana | 37583.33 | Connecticut | 48673.59 |
| Iowa | 37949.97 | Maryland | 49459.90 |
| Missouri | 38097.77 | New Jersey | 50449.54 |
| Georgia | 38224.75 | Alaska | 50954.06 |

Table 13

School Size by State, between 1991 and 2006

| State | School Size | State | School Size |
|----------------|-------------|---------------|-------------|
| Florida | 870.23 | Illinois | 510.13 |
| California | 759.63 | Kentucky | 497.48 |
| Georgia | 745.71 | Rhode Island | 495.91 |
| Hawaii | 719.86 | Ohio | 493.32 |
| Nevada | 705.68 | Michigan | 491.63 |
| New York | 672.84 | Colorado | 478.59 |
| Utah | 672.03 | New Mexico | 449.72 |
| Delaware | 662.40 | Oregon | 447.79 |
| Maryland | 658.85 | New Hampshire | 431.44 |
| Virginia | 637.44 | Wisconsin | 425.62 |
| South Carolina | 635.74 | Missouri | 425.07 |
| Texas | 613.48 | Idaho | 422.00 |
| North Carolina | 613.46 | Arkansas | 412.24 |
| Arizona | 599.51 | West Virginia | 378.26 |
| Tennessee | 582.00 | Oklahoma | 344.06 |
| Pennsylvania | 568.92 | Iowa | 330.47 |
| Mississippi | 566.97 | Kansas | 323.31 |
| Alabama | 556.46 | Vermont | 311.06 |
| Louisiana | 546.83 | Maine | 305.56 |
| Connecticut | 542.90 | Alaska | 273.10 |
| Indiana | 541.82 | Wyoming | 245.72 |
| New Jersey | 534.60 | Nebraska | 228.82 |
| Washington | 532.27 | North Dakota | 205.17 |
| Massachusetts | 518.23 | South Dakota | 184.04 |
| Minnesota | 515.38 | Montana | 178.06 |

Louisiana has the lowest rate of -0.06. The rates for Nevada, Arizona, Idaho, Utah, Colorado, Georgia, Florida, and Texas are more than 1 standard deviation above the mean value. On the other hand, Louisiana, North Dakota, West Virginia, Pennsylvania, Ohio, New York, and Iowa have the rates which are more than 1 standard deviation below the mean value.

Table 15 shows the mean value of the attendance rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 92.87, with a standard deviation of 2.43. Kentucky has the lowest rate of 86.50 and New Mexico has the highest rate of 99.44. The rates for Kentucky, Oregon, Illinois, New York, Kansas, Montana, and Arizona are more than 1 standard deviation below the mean value. On the other hand, New Mexico, Virginia, California, Connecticut, New Hampshire, and Iowa have the rates which are more than 1 standard deviation above the mean value.

Table 16 shows the mean value of the high school age pregnancy rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 2.80, with a standard deviation of 1.03. Delaware has the highest rate of 6.44 and New Hampshire has the lowest rate of 1.13. The rates for Delaware, Mississippi, Texas, New Mexico, Arizona, Georgia, Alabama, Arkansas, and Louisiana are more than 1 standard deviation above the mean value. On the other hand, New Hampshire, Vermont, North Dakota, Maine, Minnesota, and Massachusetts have the rates which are more than 1 standard deviation below the mean value.

Table 17 shows the mean value of the minority student rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 29.19, with a standard deviation of 17.37. Hawaii has the highest rate of 77.65 and

Table 14

Population Change by State, between 1991 and 2006

| State | Population Change | State | Population Change |
|----------------|-------------------|---------------|-------------------|
| Nevada | 4.69 | Montana | 1.00 |
| Arizona | 3.44 | Wisconsin | 1.00 |
| Idaho | 2.50 | Hawaii | 0.94 |
| Utah | 2.38 | Oklahoma | 0.94 |
| Colorado | 2.31 | New Jersey | 0.88 |
| Georgia | 2.31 | Mississippi | 0.81 |
| Florida | 2.19 | Alabama | 0.75 |
| Texas | 2.13 | South Dakota | 0.75 |
| North Carolina | 1.88 | Wyoming | 0.75 |
| Oregon | 1.63 | Nebraska | 0.69 |
| Washington | 1.63 | Illinois | 0.63 |
| New Mexico | 1.44 | Kansas | 0.63 |
| Delaware | 1.38 | Vermont | 0.56 |
| Tennessee | 1.38 | Michigan | 0.50 |
| Alaska | 1.31 | Rhode Island | 0.50 |
| South Carolina | 1.31 | Connecticut | 0.38 |
| California | 1.25 | Massachusetts | 0.38 |
| Arkansas | 1.19 | Maine | 0.31 |
| Virginia | 1.19 | Iowa | 0.25 |
| Maryland | 1.13 | New York | 0.25 |
| Minnesota | 1.13 | Ohio | 0.25 |
| Missouri | 1.13 | Pennsylvania | 0.13 |
| Indiana | 1.06 | West Virginia | 0.06 |
| Kentucky | 1.06 | North Dakota | 0.00 |
| New Hampshire | 1.06 | Louisiana | -0.06 |

Table 15

Attendance Rate by State, between 1991 and 2006

| State | Attendance Rate | State | Attendance Rate |
|----------------|-----------------|----------------|-----------------|
| Kentucky | 86.50 | Wyoming | 92.63 |
| Oregon | 88.81 | Maine | 92.81 |
| Illinois | 89.13 | North Carolina | 93.00 |
| New York | 89.25 | Utah | 93.00 |
| Kansas | 89.38 | Nevada | 93.13 |
| Montana | 89.56 | Wisconsin | 93.19 |
| Arizona | 89.75 | Indiana | 93.31 |
| Ohio | 90.88 | Oklahoma | 93.38 |
| Alaska | 91.19 | Georgia | 93.56 |
| Michigan | 91.31 | Mississippi | 93.56 |
| Maryland | 91.50 | Arkansas | 93.63 |
| Missouri | 91.69 | West Virginia | 93.63 |
| Florida | 91.94 | North Dakota | 93.75 |
| Rhode Island | 92.00 | Massachusetts | 94.00 |
| South Dakota | 92.00 | Idaho | 94.06 |
| Hawaii | 92.19 | Minnesota | 94.50 |
| Tennessee | 92.19 | New Jersey | 95.06 |
| Colorado | 92.38 | Alabama | 95.13 |
| Louisiana | 92.38 | Vermont | 95.25 |
| Texas | 92.44 | Iowa | 95.56 |
| Washington | 92.44 | New Hampshire | 95.56 |
| South Carolina | 92.50 | Connecticut | 96.25 |
| Nebraska | 92.56 | California | 97.94 |
| Pennsylvania | 92.56 | Virginia | 98.87 |
| Delaware | 92.63 | New Mexico | 99.44 |

Table 16
Pregnancy Rate by State, between 1991 and 2006

| State | Pregnancy Rate | State | Pregnancy Rate |
|----------------|----------------|---------------|----------------|
| Delaware | 6.44 | Michigan | 2.50 |
| Mississippi | 4.69 | West Virginia | 2.50 |
| Texas | 4.50 | Idaho | 2.44 |
| New Mexico | 4.38 | Kansas | 2.44 |
| Arizona | 4.25 | Rhode Island | 2.44 |
| Georgia | 4.00 | Virginia | 2.44 |
| Alabama | 3.94 | Alaska | 2.38 |
| Arkansas | 3.94 | Washington | 2.38 |
| Louisiana | 3.94 | Pennsylvania | 2.31 |
| South Carolina | 3.81 | Montana | 2.13 |
| Nevada | 3.63 | New York | 2.13 |
| North Carolina | 3.56 | South Dakota | 2.13 |
| Tennessee | 3.56 | Utah | 2.13 |
| Oklahoma | 3.44 | Wyoming | 2.13 |
| California | 3.31 | Connecticut | 2.00 |
| Kentucky | 3.19 | Nebraska | 2.00 |
| Florida | 3.06 | Wisconsin | 2.00 |
| Illinois | 3.06 | Iowa | 1.88 |
| Colorado | 2.88 | New Jersey | 1.88 |
| Missouri | 2.88 | Massachusetts | 1.63 |
| Indiana | 2.69 | Minnesota | 1.63 |
| Maryland | 2.63 | Maine | 1.44 |
| Hawaii | 2.56 | North Dakota | 1.44 |
| Ohio | 2.56 | Vermont | 1.31 |
| Oregon | 2.56 | New Hampshire | 1.13 |

Vermont has the lowest rate of 3.34. The rates for Hawaii, New Mexico, California, Texas, Mississippi, and Louisiana are more than 1 standard deviation above the mean value. On the other hand, Vermont, Maine, New Hampshire, West Virginia, Idaho, and Iowa have the rates which are more than 1 standard deviation below the mean value.

Table 18 shows the mean value of the White student rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 70.81, with a standard deviation of 17.37. Vermont has the highest rate of 96.66 and Hawaii has the lowest rate of 22.35. The rates for Vermont, Maine, New Hampshire, West Virginia, Idaho, and Iowa are more than 1 standard deviation above the mean value. On the other hand, Hawaii, New Mexico, California, Texas, Mississippi, and Louisiana have the rates which are more than 1 standard deviation below the mean value.

Table 19 shows the mean value of the black student rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 13.92, with a standard deviation of 13.18. Mississippi has the highest rate of 50.79 and Idaho has the lowest rate of 0.41. The rates for Mississippi, Louisiana, South Carolina, Georgia, Alabama, Maryland, North Carolina, and Delaware are more than 1 standard deviation above the mean value. On the other hand, Idaho and Montana have the rates which are more than 1 standard deviation below the mean value.

Table 20 shows the mean value of the Hispanic student rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 8.95, with a standard deviation of 11.15. New Mexico has the highest rate of 48.80 and West Virginia has the lowest rate of 0.42. The rates for New Mexico, California, Texas, Arizona, Nevada, and Colorado are more than 1 standard deviation above the mean value.

Table 17

Minority Student Percentage in Public School by State, between 1991 and 2006

| State | Minority Percentage | State | Minority Percentage |
|----------------|------------------------|---------------|------------------------|
| Hawaii | 77.65 | Michigan | 24.84 |
| New Mexico | 64.10 | Washington | 24.50 |
| California | 62.29 | Rhode Island | 23.59 |
| Texas | 56.68 | Massachusetts | 23.11 |
| Mississippi | 52.56 | Pennsylvania | 21.13 |
| Louisiana | 49.41 | Kansas | 20.09 |
| Arizona | 46.15 | Missouri | 19.88 |
| Maryland | 45.10 | Ohio | 18.74 |
| Georgia | 45.01 | Oregon | 18.33 |
| Florida | 44.77 | Wisconsin | 18.15 |
| South Carolina | 44.04 | Indiana | 16.05 |
| New York | 43.27 | Nebraska | 16.04 |
| New Jersey | 41.87 | South Dakota | 15.81 |
| Nevada | 39.46 | Minnesota | 15.49 |
| Illinois | 38.70 | Montana | 13.66 |
| Alabama | 38.69 | Utah | 12.84 |
| Alaska | 38.61 | Wyoming | 12.18 |
| Delaware | 38.53 | North Dakota | 12.18 |
| North Carolina | 37.95 | Kentucky | 11.83 |
| Virginia | 35.61 | Iowa | 9.28 |
| Oklahoma | 33.80 | Idaho | 7.32 |
| Colorado | 30.66 | West Virginia | 5.25 |
| Connecticut | 28.88 | New Hampshire | 4.46 |
| Arkansas | 27.89 | Maine | 3.59 |
| Tennessee | 26.07 | Vermont | 3.34 |

Table 18

White Student Percentage in Public School by State, between 1991 and 2006

| State | White Percentage | State | White Percentage |
|---------------|------------------|----------------|------------------|
| Vermont | 96.66 | Tennessee | 73.93 |
| Maine | 96.42 | Arkansas | 72.11 |
| New Hampshire | 95.54 | Connecticut | 71.12 |
| West Virginia | 94.75 | Colorado | 69.34 |
| Idaho | 92.68 | Oklahoma | 66.20 |
| Iowa | 90.72 | Virginia | 64.39 |
| Kentucky | 88.17 | North Carolina | 62.05 |
| North Dakota | 87.82 | Delaware | 61.47 |
| Wyoming | 87.82 | Alaska | 61.40 |
| Utah | 87.16 | Alabama | 61.31 |
| Montana | 86.34 | Illinois | 61.30 |
| Minnesota | 84.51 | Nevada | 60.54 |
| South Dakota | 84.19 | New Jersey | 58.13 |
| Nebraska | 83.96 | New York | 56.73 |
| Indiana | 83.95 | South Carolina | 55.96 |
| Wisconsin | 81.85 | Florida | 55.23 |
| Oregon | 81.67 | Georgia | 54.99 |
| Ohio | 81.26 | Maryland | 54.90 |
| Missouri | 80.12 | Arizona | 53.85 |
| Kansas | 79.91 | Louisiana | 50.59 |
| Pennsylvania | 78.87 | Mississippi | 47.44 |
| Massachusetts | 76.89 | Texas | 43.32 |
| Rhode Island | 76.41 | California | 37.71 |
| Washington | 75.50 | New Mexico | 35.90 |
| Michigan | 75.16 | Hawaii | 22.35 |

Table 19

Black Student Percentage in Public School by State, between 1991 and 2006

| State | Black Percentage | State | Black Percentage |
|----------------|------------------|---------------|------------------|
| Mississippi | 50.79 | Wisconsin | 9.42 |
| Louisiana | 46.06 | Kansas | 8.55 |
| South Carolina | 41.05 | Massachusetts | 8.49 |
| Georgia | 37.91 | California | 8.28 |
| Alabama | 35.89 | Rhode Island | 7.43 |
| Maryland | 35.59 | Nebraska | 6.49 |
| North Carolina | 30.62 | Minnesota | 5.88 |
| Delaware | 30.22 | Colorado | 5.61 |
| Virginia | 26.52 | Washington | 5.00 |
| Florida | 24.34 | Alaska | 4.65 |
| Tennessee | 23.45 | Arizona | 4.50 |
| Arkansas | 23.22 | West Virginia | 4.26 |
| Illinois | 20.66 | Iowa | 3.78 |
| New York | 19.40 | Oregon | 2.67 |
| Michigan | 18.75 | Hawaii | 2.48 |
| New Jersey | 16.77 | New Mexico | 2.35 |
| Missouri | 16.68 | Maine | 1.29 |
| Ohio | 15.80 | Wyoming | 1.17 |
| Pennsylvania | 14.60 | New Hampshire | 1.16 |
| Texas | 14.22 | South Dakota | 1.04 |
| Connecticut | 13.14 | Vermont | 1.00 |
| Indiana | 11.49 | North Dakota | 0.99 |
| Oklahoma | 10.56 | Utah | 0.89 |
| Kentucky | 10.06 | Montana | 0.61 |
| Nevada | 9.78 | Idaho | 0.41 |

Table 20

Hispanic Student Percentage in Public School by State, between 1991 and 2006

| State | Hispanic Percentage | State | Hispanic Percentage |
|---------------|---------------------|----------------|---------------------|
| New Mexico | 48.80 | Maryland | 4.79 |
| California | 41.83 | Pennsylvania | 4.40 |
| Texas | 39.55 | Wisconsin | 4.32 |
| Arizona | 32.54 | North Carolina | 4.14 |
| Nevada | 22.50 | Indiana | 3.42 |
| Colorado | 21.15 | Iowa | 3.33 |
| New Jersey | 19.14 | Arkansas | 3.29 |
| Florida | 18.28 | Alaska | 3.25 |
| New York | 17.68 | Michigan | 3.23 |
| Illinois | 14.58 | Minnesota | 3.10 |
| Connecticut | 12.61 | South Carolina | 1.84 |
| Rhode Island | 12.46 | Montana | 1.74 |
| Massachusetts | 10.09 | Missouri | 1.74 |
| Oregon | 9.77 | New Hampshire | 1.72 |
| Washington | 9.75 | Ohio | 1.71 |
| Kansas | 8.23 | Louisiana | 1.47 |
| Utah | 7.90 | Tennessee | 1.41 |
| Wyoming | 7.03 | Alabama | 1.28 |
| Nebraska | 6.62 | North Dakota | 1.23 |
| Delaware | 5.77 | South Dakota | 1.10 |
| Oklahoma | 5.60 | Kentucky | 0.98 |
| Idaho | 5.53 | Mississippi | 0.70 |
| Hawaii | 4.89 | Maine | 0.61 |
| Georgia | 4.81 | Vermont | 0.59 |
| Virginia | 4.79 | West Virginia | 0.42 |

Table 21 shows the mean value of the Asian student rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 3.82, with a standard deviation of 9.75. Hawaii has the highest rate of 69.86 and West Virginia has the lowest rate of 0.47. The rate for Hawaii is more than 1 standard deviation above the mean value.

Table 22 shows the mean value of the Native American student rate for each state for the years from 1991 to 2006. The mean value of these rates across the 50 states for the 16 years is 2.49, with a standard deviation of 4.93. Alaska has the highest rate of 25.30 and West Virginia has the lowest rate of 0.10. The rates for Alaska, Oklahoma, South Dakota, New Mexico, Montana, and North Dakota are more than 1 standard deviation above the mean value.

Table 23 provides the descriptive statistics for each variable. As for the dropout rate, the number of observations is 629. Minimum value and maximum value are 1.70 and 13.70, respectively, with a mean value of 4.65 and a standard deviation of 1.81. The variable program is dummy coded. As for the poverty rate, the number of observations is 800. Minimum value and maximum value are 4.50 and 26.40, respectively, with a mean value of 12.38 and a standard deviation of 3.57. As for the unemployment rate, the number of observations is 800. Minimum value and maximum values are 2.30 and 11.30, respectively, with a mean value of 5.11 and a standard deviation of 1.40. As for the educational attainment of 25 and over, the number of observations is 750. Minimum value and maximum value are 67.10 and 92.80, respectively, with a mean value of 83.78 and a standard deviation of 4.82. As for the student/teacher ratio, the number of observations is 800. Minimum value and maximum value are 10.80 and 24.90,

Table 21

Asian Student Percentage in Public School by State, between 1991 and 2006

| State | Asian Percentage | State | Asian Percentage |
|---------------|------------------|----------------|------------------|
| Hawaii | 69.86 | Michigan | 1.81 |
| California | 11.36 | Iowa | 1.68 |
| Washington | 7.13 | North Carolina | 1.65 |
| New Jersey | 5.82 | Nebraska | 1.46 |
| New York | 5.77 | Oklahoma | 1.40 |
| Alaska | 5.41 | New Hampshire | 1.34 |
| Nevada | 5.35 | Louisiana | 1.27 |
| Minnesota | 4.57 | Vermont | 1.19 |
| Maryland | 4.38 | Missouri | 1.17 |
| Massachusetts | 4.29 | Ohio | 1.12 |
| Virginia | 4.06 | Maine | 1.06 |
| Oregon | 3.80 | New Mexico | 1.05 |
| Illinois | 3.30 | Tennessee | 1.05 |
| Rhode Island | 3.19 | Indiana | 0.93 |
| Wisconsin | 2.98 | South Carolina | 0.92 |
| Connecticut | 2.85 | Montana | 0.92 |
| Colorado | 2.81 | Arkansas | 0.92 |
| Texas | 2.64 | Wyoming | 0.86 |
| Utah | 2.55 | South Dakota | 0.81 |
| Delaware | 2.29 | North Dakota | 0.78 |
| Georgia | 2.15 | Alabama | 0.75 |
| Kansas | 2.07 | Idaho | 0.67 |
| Pennsylvania | 2.02 | Kentucky | 0.66 |
| Arizona | 1.95 | Mississippi | 0.63 |
| Florida | 1.90 | West Virginia | 0.47 |

Table 22

Native American Student Percentage in Public School by State, between 1991 and 2006

| State | Native American Percentage | State | Native American Percentage |
|----------------|----------------------------|----------------|----------------------------|
| Alaska | 25.30 | Rhode Island | 0.50 |
| Oklahoma | 16.24 | Iowa | 0.49 |
| South Dakota | 12.86 | Arkansas | 0.46 |
| New Mexico | 11.90 | Mississippi | 0.44 |
| Montana | 10.39 | Hawaii | 0.42 |
| North Dakota | 9.18 | New York | 0.42 |
| Arizona | 7.16 | Maryland | 0.34 |
| Wyoming | 3.12 | Missouri | 0.29 |
| Washington | 2.62 | Texas | 0.28 |
| Oregon | 2.08 | Connecticut | 0.28 |
| Minnesota | 1.93 | Florida | 0.25 |
| Nevada | 1.83 | New Hampshire | 0.25 |
| North Carolina | 1.53 | Massachusetts | 0.24 |
| Utah | 1.50 | Delaware | 0.24 |
| Nebraska | 1.47 | South Carolina | 0.23 |
| Wisconsin | 1.42 | Virginia | 0.23 |
| Kansas | 1.23 | Indiana | 0.20 |
| Colorado | 1.09 | Tennessee | 0.17 |
| Michigan | 1.05 | Illinois | 0.16 |
| California | 0.82 | New Jersey | 0.15 |
| Alabama | 0.78 | Georgia | 0.14 |
| Idaho | 0.70 | Kentucky | 0.13 |
| Louisiana | 0.61 | Ohio | 0.12 |
| Maine | 0.58 | Pennsylvania | 0.12 |
| Vermont | 0.56 | West Virginia | 0.10 |

respectively, with a mean value of 16.09 and a standard deviation of 2.34. As for the real expenditure per student, the number of observations is 800. Minimum value and maximum value are 3.97 (x1000) and 15.41(x1000), respectively, with a mean value of 7.96(x1000) and a standard deviation of 1.93(x1000). As for the household income, the number of observation is 799. Minimum value and maximum value are 23.10(x1000) and 58.45(x1000), respectively, with a mean value of 38.96(x1000) and a standard deviation of 1.93(x1000). As for the school size, the number of observation is 800. Minimum value and maximum value are 13.20(x10) and 93.32(x10), respectively, with a mean value of 49.72(x10) and a standard deviation of 16.05(x10). As for the population change rate, the number of observations is 800. Minimum value and maximum value are -6.00 and 12.00, respectively, with a mean value of 1.15 and a standard deviation of 1.22. As for the attendance rate, the number of observations is 800. Minimum value and maximum value are 85.00 and 105.00, respectively, with a mean value of 92.87 and a standard deviation of 2.78. As for the pregnancy rate, the number of observations is 800. Minimum value and maximum value are 1.00 and 10.00, respectively, with a mean value of 2.80 and a standard deviation of 1.24. As for the white student rate, the number of observations is 787. Minimum value and maximum value are 18.18 and 100.00, respectively, with a mean value of 70.76 and a standard deviation of 17.65. As for the black student rate, the number of observations is 787. Minimum value and maximum value are 0.00 and 50.96, respectively, with a mean value of 13.82 and a standard deviation of 13.08. As for the Hispanic student rate, the number of observations is 787. Minimum value and maximum value are 0.00 and 81.82, respectively, with a mean value of 9.04 and a standard deviation of 11.59. As for the Asian student rate, the number of observations is 787.

Table 23

Dependent and Independent Variables

| Variable | N | Minimum | Maximum | Mean | SD |
|---|-----|---------|---------|-------|-------|
| Dropout Rate (%) | 629 | 1.70 | 13.70 | 4.65 | 1.81 |
| Program | 800 | 0.00 | 1.00 | 0.10 | 0.30 |
| Poverty Rate (%) | 800 | 4.50 | 26.40 | 12.38 | 3.57 |
| Unemployment Rate (%) | 800 | 2.30 | 11.30 | 5.11 | 1.40 |
| Educational Attainment of 25 and over (High School or more) (%) | 750 | 67.10 | 92.80 | 83.78 | 4.82 |
| Teacher / Student Ratio | 800 | 10.80 | 24.90 | 16.09 | 2.34 |
| Expenditure Per Student (per \$1,000) | 800 | 3.97 | 15.41 | 7.96 | 1.93 |
| Household Income (per \$1,000) | 799 | 23.10 | 58.45 | 38.96 | 6.44 |
| School Size (per 10 students) | 800 | 13.20 | 93.32 | 49.72 | 16.05 |
| Population Change Rate (%) | 800 | -6.00 | 12.00 | 1.15 | 1.22 |
| Attendance Rate (%) | 800 | 85.00 | 105.00 | 92.87 | 2.78 |
| Pregnancy Rate (%) | 800 | 1.00 | 10.00 | 2.80 | 1.24 |
| White (%) | 787 | 18.18 | 100.00 | 70.76 | 17.65 |
| Black (%) | 787 | 0.00 | 50.96 | 13.82 | 13.08 |
| Hispanic (%) | 787 | 0.00 | 81.82 | 9.04 | 11.59 |
| Asian (%) | 787 | 0.00 | 72.94 | 3.85 | 9.77 |
| Native American (%) | 790 | 0.00 | 27.88 | 2.52 | 4.97 |
| Minority (%) | 787 | 0.00 | 81.82 | 29.24 | 17.65 |
| Valid N (list wise) | 606 | | | | |

Note. Program is dummy coded. White and Minority are not included in the FGLS estimate due to the collinearity.

Minimum value and maximum value are 0.00 and 72.94, respectively, with a mean value of 3.85 and a standard deviation of 9.77. As for the Native American student rate, the number of observations is 790. Minimum value and maximum value are 0.00 and 27.88, respectively, with a mean value of 2.52 and a standard deviation of 4.97. As for the minority student rate, the number of observations is 787. Minimum value and maximum value are 0.00 and 81.82, respectively, with a mean value of 29.24 and a standard deviation of 17.65.

Panel Data Analysis

Table 24 provides the estimated high stakes testing policy effect on high school dropouts along with other factors. A feasible generalized least square estimates on a panel data set was computed to predict the percentage of the high school dropout based on the program, poverty rate, unemployment rate, educational attainment of 25 and over, student/teacher ratio, expenditure per student, household income, school size, population change rate, attendance rate, pregnancy rate, percentage of Black, percentage of Hispanic, percentage of Asian, and percentage of Native American. A significant regression equation was found (Wald Chi-Square (15) = 251.07, $p = < 0.000$). The predicted high school dropout rate is equal to $5.242 + 0.521 (\text{Program}) + 0.012 (\text{Poverty Rate}) - 0.063 (\text{Unemployment Rate}) - 0.011 (\text{Educational Attainment of 25 and over}) + 0.128 (\text{Student/Teacher Ratio}) - 0.113 (\text{Expenditure per Student}) - 0.021 (\text{Household Income}) + 0.015 (\text{School Size}) + 0.042 (\text{Population Change Rate}) - 0.015 (\text{Attendance Rate}) + 0.159 (\text{Pregnancy Rate}) + 0.003 (\text{Black}) + 0.009 (\text{Hispanic}) + 0.008 (\text{Asian}) + 0.042 (\text{Native American})$, where the program is dummy coded as 1 = existence of the program and coded as 0 = non existence of the program. The following findings assume that the other

variables in the equation are held constant which is the assumption of generalized least square estimates. The high school dropout rate increases by 0.521 percent when the program exists and increases by 0.012 percent when the poverty rate increases by 1 percent. The high school dropout rate decreases by 0.063 percent when the unemployment rate increases by 1 percent and decreases by 0.011 percent when the educational attainment of 25 and over increases by 1 percent. The high school dropout rate increases by 0.128 percent when the student/teacher ratio increases by 1 and decreases by 0.113 percent when the expenditure per student increases by \$1,000. The high school dropout rate decreases by 0.021 percent when the household income increases by \$1,000 and increases by 0.015 percent when the school size increases by 10 students. The high school dropout rate increases by 0.042 percent when the population change rate increases by 1 percent and decreases by 0.015 percent when the attendance rate increases by 1 percent. The high school dropout rate increases by 0.159 percent when the pregnancy rate increases by 1 percent and decreases by 0.003 percent when the Black student percentage increases by 1 percent. The high school dropout rate increases by 0.009 percent when the Hispanic student percentage increases by 1 percent and increases by 0.008 percent when the Asian student percentage increases by 1 percent. The high school dropout rate increases by 0.042 percent when the Native American student percentage increases by 1 percent. However, poverty rate, unemployment rate, population change rate, educational attainment of 25 and over, attendance rate, Asian student percentage, and Black student percentage are not statistically significant predictors at 95% confidence level.

Table 24

Estimated High Stakes Testing Policy Effect on High school Dropouts
in the 50 states in 1991 to 2006

| Variable | β | (SE) |
|---|-----------|-------|
| Program | 0.521*** | 0.125 |
| Poverty Rate (%) | 0.012 | 0.014 |
| Unemployment Rate (%) | -.063* | 0.032 |
| Educational Attainment of 25 and over (High School or more) (%) | -0.011 | 0.012 |
| Student / Teacher Ratio | 0.128*** | 0.033 |
| Expenditure per student (per \$1,000) | -0.113*** | 0.038 |
| Household Income (per \$1,000) | -0.021** | 0.01 |
| School Size (per 10 students) | 0.015** | 0.007 |
| Population Change Rate (%) | 0.042* | 0.025 |
| Attendance Rate (%) | -0.015 | 0.016 |
| Pregnancy Rate (age 15 - 17) (%) | 0.159*** | 0.056 |
| Black (%) | 0.003 | 0.006 |
| Hispanic (%) | 0.009** | 0.004 |
| Asian (%) | 0.008* | 0.004 |
| Native American (%) | 0.042*** | 0.016 |

Note. Wald Chi-Square 251.07 (15), $p < 0.000$. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Discussion

As a whole, all the coefficients showed expected directions, although some of the variables were not statistically significant. Eight variables were found to be statistically significant at 95% confidence level. Those variables were Program, Student/Teacher ratio, Expenditure per Student, Household Income, School Size, Pregnancy Rate, Hispanic, and Native American. Seven variables were found to be statistically insignificant at 95% confidence level. Those variables were Poverty Rate, Unemployment Rate, Educational Attainment of 25 and over, Population Change Rate, Attendance Rate, Black, and Asian.

Existence of Program or high stakes testing policy increases the high school dropout rate and this variable was statistically significant at 95% confidence level. The effect of the high stakes testing policy on the high school dropout rate has been controversial. This study found that the high stakes testing policy pushes high school students out of the schools. After failing the examination, students are retained in the same grade and feel embarrassed or feel uncomfortable with younger peers, and discouraged from continuing to study. Many of previous studies indicated this prediction and this outcome supported Hypothesis 1 of this study.

Poverty brings up the high school dropout rate; however, this variable was statistically insignificant at 95% confidence level. Ordinarily, the socioeconomic condition of a community affects dropout rate. If a student lives in high poverty area with less access to quality social networks and mentors, he or she is discouraged from going to school, which has negative impact on dropout rate. Previous studies indicated this prediction, but this outcome did not support Hypothesis 2 of this study.

A high unemployment rate reduces the high school dropout rate; however, this variable was statistically insignificant at 95% confidence level. As we see, in the period of economic recession, people tend to go back to schools or stay in schools. In other words, if there are job opportunities available, students are more likely to leave schools and grab the jobs. Previous studies indicated this prediction, but this outcome did not support Hypothesis 3 of this study.

The educational attainment of adult population used as a proxy variable for the educational attainment of parents of high school students seems to have a negative relationship with high school dropout rate; however, this variable was statistically insignificant at 95% confidence level. Previous study indicated that the more educated the parents were, the lower the high school dropout was. Ordinarily, if parents' academic achievement is high, they can earn more, and can promote aspiration of students and spend more time with students. However, this outcome did not meet the expectations of previous studies, and did not support Hypothesis 4 of this study.

Student/Teacher ratio used as a proxy variable for student/teacher ratio in high schools has a positive relationship with high school dropouts and this variable was statistically significant at 95% confidence level. The higher the rate is, the higher the high school dropout rate is. If the student/teacher ratio is high and students receive less attention, students are discouraged from completing schools. Previous studies indicated this prediction and this outcome supported Hypothesis 5 of this study.

Expenditure per student used as a proxy variable for expenditure per high school student has a negative relationship with the high school dropout rate and this variable was statistically significant at 95% confidence level. If the expenditure per high school

student is low, that affects class size and quality of teachers and facilities. Previous studies indicated this prediction, and this outcome supported Hypothesis 6 of this study.

Household income as a proxy variable for students' household income has a negative relationship with the high school dropout rate and this variable was statistically significant at 95% confidence level. If a student's household income is low, the student is put under the pressure of have to work. Previous studies indicated this prediction, and this outcome supported Hypothesis 7 of this study.

School size has a positive relationship with high school dropouts and this variable was statistically significant at 95% confidence level. If the school has large number of students, it often has a poor social climate. Previous studies indicated this prediction, and this outcome supported Hypothesis 8 of this study.

Population change rate as a proxy variable for student's mobility rate has a positive relationship with the high school dropout rate; however, this variable was statistically insignificant at 95% confidence level. If a student moves often and transfers schools and has difficulty adjusting to new environment, that has a negative impact on the dropout rate. Previous studies indicated this prediction; however, this outcome did not support Hypothesis 9 of this study.

Attendance rate as a proxy variable for attendance rate for high school students has a discordant relationship with the high school dropout rate; however, this variable was statistically insignificant at 95% confidence level. Ordinarily, if the student's attendance rate is low, that has negative impact on the dropout rate. Previous studies indicated this prediction, but this outcome did not support Hypothesis 10 of this study.

Pregnancy rate as a proxy variable for pregnancy rate for high school students has a positive relationship with the high school dropout rate and this variable was statistically significant at 95% confidence level. If a student who are at school become pregnant, they are likely to leave their school. Previous studies indicated this prediction and this outcome supported Hypothesis 11 of this study.

Rate of Black students as a proxy variable for rate of Black high school students has a positive relationship with the high school dropout rate, but this variable was statistically insignificant at 95% confidence level. If a state has a higher Black student rate, the state tends to have a higher high school dropout rate. Some ethnic groups do not appreciate that education and cultural background affect dropout rate. Previous studies indicated this prediction, but this outcome did not support Hypothesis 12 of this study.

Rate of Hispanic students has a positive relationship with the high school dropout and this variable was statistically significant at 95% confidence level. If a state has a higher Hispanic student rate, the state tends to have a higher high school dropout rate. Some ethnic groups do not appreciate that education and cultural background affect dropout rate. Previous studies indicated this prediction, and this outcome supported Hypothesis 13 of this study.

This study, also, found that other minority group, rate of Native American students, showed the same predictions as Hispanic student rate and the variable was statistically significant at 95% confidence level. As for the rate of Asian students, there seemed to be a positive relationship with the high school dropout rate; however, the variable was not statistically significant at 95 % confidence level.

Chapter Summary

In this chapter, the writer conducted a quantitative analysis. In the first part of the quantitative analysis, the writer presented the descriptive analysis. In the second part of the quantitative analysis, the writer presented the panel data analysis using feasible generalized least square estimator, difference in difference estimator, and proxy variables besides dependent and independent variables for the better estimate.

All the coefficients showed expected directions, although some of the variables were not statistically significant at 95% confidence level. Eight variables were found to be statistically significant at 95% confidence level. Those variables were Program, Student/Teacher ratio, Expenditure per Student, Household Income, School Size, Pregnancy Rate, Hispanic, and Native American. Seven variables were found to be statistically insignificant at 95% confidence level. Those variables were Poverty Rate, Unemployment Rate, Educational Attainment of 25 and over, Attendance Rate, Black, and Asian.

All the coefficients of the variables showed hypothesized directions; however, some of the variables were found statistically insignificant. Therefore, this analysis supported 8 of 13 hypotheses which the writer stated in the previous section of this study.

Chapter V. SUMMARY, CONCLUSION, AND IMPLICATIONS

Conclusion and Recommendation

In this study, the writer used the factors which were suggested by previous studies and a framework constructed by Rumberger (2001) to see the effect of those conventional factors on the high school dropout rate. Those frameworks entailed elements of two frameworks. One was individual factors and another was institutional factors including family, school, and community variables. Those variables were unemployment rate, student/teacher ratio, expenditure per student, household income as a proxy variable for household income of students, school size, population change rate as a proxy variable for students' mobility and transfer rate, pregnancy rate for high school age population as a proxy variable for a pregnancy rate for high school students, poverty rate, educational attainment of 25 and over, attendance rate as a proxy variable for high school students' parents educational attainment, and minority status. In addition, the writer included the factor, high stakes testing policy.

This study found that the conventional factors- high student/teacher ratio, low expenditure per student, low household income of student's household, large school size, high pregnancy rate of students, and minority status of students- all contribute to higher high school dropout rate. Moreover, high stakes testing policy has a negative effect on the high school dropouts.

Adoption of high stakes testing policy for high schools, in the form of an exit examination, has been a trend and many states have been adopting this policy. In 2006, 20 states had adopted this policy and 6 planned to adopt the policy. Policy makers believe

high stakes testing policy helps students to achieve better educational outcomes.

However, this perspective in terms of high school dropouts has been controversial. Many previous studies support this policy by saying the policy does not affect the high school dropout rate. A large number of studies, however, disagree with this perspective. Those studies argue the policy has negatively affected high school students and, as a result, students leave their schools.

This study found that those conventional factors do bring a negative outcome to students, in other words, they affect the student's decision to leave a school. Furthermore, the high stakes testing policy also has a negative impact on students, determined statistically by employing a difference in difference estimator, a feasible least square estimator, and proxy variables on a panel data set obtained from 50 states.

United States has been known for many achievements- a high standard of living, important discoveries, inventions, and the ability to organize and overcome problems. In terms of high technology, Americans have invented the space shuttle, advanced computers, medical technology, and have accomplished other technological successes. However, as important as these achievements are, they are really by-products of greatest achievement or an even greater American accomplishment-American education.

However, the problem of high school dropouts has plagued the United States consistently over the last several decades. This writer believes that the education of children is important in the future of any community. This problem of high school dropouts could bring serious consequences to the U.S.

As this study revealed, the conventional factors that are responsible for the high school dropouts still exist in this country, and policy makers, public administrators,

educators, and parents should endeavour to address and overcome this problem keeping these factors in mind. Also, this study found that the high stakes testing policy and the high school exit examination are hurting some portion of high school students and affect their decision to leave their schools. The writer suggests that policy makers should consider the serious consequences of this high stakes testing, and reconsider the implementation of this policy.

Limitation of Study

There are 3 limitations of this study that need to be put into consideration. Those are the limitation of data on high schools, the limitation of data on the factors, and the limitation of proxy variables. These limitations exist due to the unavailability of data.

This study used data from only public schools since the data from private schools were not available. Therefore, the result of the quantitative analysis only reflects the public schools and is true only for the public schools.

There are many reasons for the high school dropout problem, as previous studies showed. However, the data for all the variables were not available. The writer had to omit some of the conventional factors from this research. Fortunately, the quantitative analysis model was statistically significant with Wald Chi-Square 251.07 (15), $p < 0.000$, hence the writer does not believe there is a problem of validity in this analysis.

This study used proxy variables to have better estimates. Proxy variables are not the best measurement, but better than nothing. A proxy variable does not represent the target population accurately, yet, as previous studies showed, using proxy variables is better than omitting variables. Due to the availability of data, the writer chose to use the proxy variables instead of dropping them.

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“Evaluation of the After School Tutorial Program at the Community School for Apprenticeship Learning (CSAL).” (with Orscini L. Beard) (2010). *Monograph of National Conference of the National Association of African American Studies and Affiliates*, pgs. 784-803.

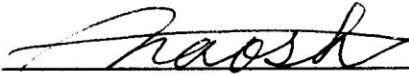
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