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John Wang April 9, 2018

Not So Simple: Great Recession's Nuanced Impact on Student Learning Outcomes Contextualized under No Child Left Behind and Georgia

by

John Wang

Dr. Leonard A. Carlson

Department of Economics

Leonard A. Carlson

Adviser

Steve Batterson

Committee Member

Vanessa Siddle Walker

Committee Member

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John Wang

Leonard A. Carlson

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Abstract

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The Great Recession began in December 2007 and ended in June 2009, causing sharp declines to GDP and unemployment. The impact of the Great Recession on student learning outcomes has not been studied very often. When the issue is addressed, it is typically not done in a rigorous manner. We examine the effects of the Great Recession in the context of No Child Left Behind and Georgia to determine the average effects on student learning outcomes, proxied by student test pass rates in Math, Reading, English-Language Arts, Science, and Social Studies. We conduct hypothesis tests to determine how poorer schools compare to richer schools by separating Title I Schools, in which 40% of students are on free/reduced lunch, and Non-Title I Schools, in which <40% of students are on free/reduced lunch. We distinguish between subject tests that are assessed under Adequate Yearly Progress (AYP) and those that are not because failing to pass tests assessed under AYP result in consequences, incentivizing schools to focus on those tests. Furthermore, we test whether there are distinctions between Elementary/Middle Schools and High Schools. We also use empirical models to examine effect magnitudes of the Great Recession in Title I Elementary/Middle Schools test pass rates. Our results find that there are similar effect directions between both Title I and Non-Title I Schools, significant decreases for tests not assessed by AYP for Elementary/Middle Schools but not High Schools, and significant increases for Reading/English-Language Arts for Elementary/Middle Schools as well Math/Science for High Schools. The empirical models confirm the effect directions and find statistically significant effect sizes for all test pass rates except Social Studies. In addition, we find that there are different effects of the Great Recession among different quantiles for each test pass rate. Results reveal a nuanced impact of the Great Recession and highlight two key implications: The Great Recession's potential effect on long term learning outcomes and meeting AYP. The results extend beyond Georgia given that the Great Recession's far reaching effect. Future research directions expands on the work by including different levels of education data as well as future economic downturns.

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I. Introduction

The Great Recession began in December 2007 and ended in June 2009; it led to sharp declines in Gross Domestic Product and Unemployment in the United States as well as the global economy (Weinberg 2013). While the aftermath of the Great Recession is still being examined, its effect on education has been less frequently researched. When it is researched, the impact of the Great Recession on education typically focuses on funding for schools/school districts or presents self-reported surveys that do not present sufficiently rigorous evidence(AASA 2010; Center for Public Education 2010). One recent paper examines the effect of the Great Recession on funding and subsequently the National Assessment of Educational Progress (NAEP) scores; however, the research fails to account for the broader educational context and implications of the Great Recession. In particular, the Great Recession took place while No Child Left Behind (NCLB), a major educational initiative from 2002 to 2015, legislation was in effect.

Once hailed as a landmark piece of legislation to change the U.S. public education system for the better, NCLB has received an incredible amount of backlash even among its previously staunchest supporters. NCLB ushered in the standardized testing movements that is synonymous with “high-stakes testing,” tying rewards and punishments to schools and school districts when they fail to meet “Adequate Yearly Progress” (AYP). The penalties from failing to meet AYP can include: requiring supplemental educational services, opening a school to “school choice”, and restructuring a school. The paper does not attempt to argue in favor or against whether the penalties ultimately help or harm the schools; however, it focuses on NCLB’s AYP component as a crucial factor to understand the impact of the Great Recession on education.

The paper formally provides a quantitative examination of the impact of the Great Recession on student learning outcomes, proxied by test score pass rates, at the school district level. Furthermore, it attempts to develop a more nuanced picture than previous research; it examines how the Great Recession impacted poorer schools compared to wealthier schools. As a proxy for the comparison between poorer and wealthier schools, we separate Title I Schools, in which 40% of students are on free/reduced lunch, and Non-Title I Schools, in which <40% of students are on free/reduced lunch. In addition, we examine whether there are different effects on tests that are assessed by AYP because failing to meet AYP can result in punishments, incentivizing schools to focus dwindling resources on those tests. Finally, we examine whether Elementary/Middle Schools experienced the Great Recession differently than High Schools. The paper also attempts to determine to what extent the Great Recession had an impact on test pass rates themselves. After examining the direct effect of the Great Recession on test pass rates, the paper highlights broader implications of the effect: students may not develop strong foundational skills, harming them in the long term in their ability to succeed academically, and schools may have punishments imposed for failure to meet AYP.

The research uses Georgia school districts; Georgia has readily accessible data through its NCLB report cards. Furthermore, Georgia is situated in a distinct context that facilitates a more nuanced understanding of what may be occurring in education. Using NAEP scores, a nationally representative assessment of American students' knowledge, Georgia is reported to have significantly lower scores in Mathematics from 1992 to 2011 (Nations Report Card 2015) and significantly lower scores in Reading in 1994, 1998, 2003, and 2005. Being among the states in lower end of the spectrum, Georgia may provide insights on states positioned similarly to

Georgia relative to the United States. In addition, Georgia's legacy of educational inequality provides another component that facilitates a more nuanced understanding of education; Georgia's educational system evolved similarly to other Southern States in that there existed clear education inequalities among different racial groups.

Using data primarily from the "Title I Annual Reports" from 2004 to 2010, along with supplemental data on school district characteristics, the paper conducts a series of hypothesis tests comparing the average pass rates of students. The hypothesis tests use the Criterion-Referenced Competency Test (CRCT) for Elementary/Middle Schools and the Georgia High School Graduation Test (GHSGT) for High Schools; the hypothesis tests compare before and after the Great Recession. We hypothesize that the Great Recession strictly decreased test pass rates for Title I Schools. For Non-Title I Schools, we hypothesize that the Great Recession would not necessarily decrease test pass rates for subject tests assessed by AYP, but it decreases for tests not assessed by AYP. In addition, we suspect distinctions between Elementary/Middle Schools and High Schools. We use empirical models to provide a more nuanced depiction of Title I Elementary/Middle Schools; through a series of regressions, we examine the extent to which the Great Recession impacted pass rates. Although various regressions were conducted, we focus on the results from the quantile regression and the fixed effects regression because the fixed effects model controls for misspecification that the previous pooled OLS model did not and the quantile regression provides insights on the differentiated impact among various quantiles.

We find that the hypothesis tests reveal a more nuanced impact of the Great Recession on student learning outcomes. Title I and Non-Title I Schools had similar overall effect

directions; however, they did not always decrease. Some results had been particularly counterintuitive: some tests assessed by AYP had increased while others decreased from the Great Recession, and only sometimes tests not assessed by AYP had decreased. Furthermore, the previous result depended on whether it was a Elementary/Middle School or a High School. The counterintuitive results are as follows: Reading and English-Language Arts average pass rates increased significantly for Elementary/Middle Schools; Math and Science average pass rates significantly increased for High Schools; Social Studies had no significant change of pass rates for High Schools. We attribute the increases to additional funding sources for Reading programs enacted during NCLB but slightly prior to the Great Recession for Elementary / Middle Schools. For High Schools, we attribute both the increased funding sources for Math and Science prior to the Great Recession as well as the shift from Non-Title I Schools to Title I Schools; although the data does not allow us to fully study the phenomenon, the shift may have caused Non-Title I Schools to increase the number of students on free/reduced lunches beyond the <40% threshold and cause them be reclassified as Title I Schools. The remaining Non-Title I Schools would continue to be below the 40% threshold and be more likely to have better pass rates; the Non-Title I Schools that shifted to Title I classification would most likely be better than the Title I Schools already being measured, thus obscuring the impact of the Great Recession on Title I Schools.

The empirical models find effect directions and statistical significance consistent with the hypothesis tests, including the counterintuitive results, for Title I CRCT pass rates with the exception of Social Studies. While the Pooled OLS regression did find statistical significance for Social Studies, the fixed effects OLS with controls did not. The effect sizes of the Great

Recession were large enough to make a difference in passing AYP. In addition, the effect sizes were not the same across all quantiles, as indicated by the quantile regression, and each subject indicated different trends of effect sizes. For Math, the school districts in the 25% to 75% quantiles had the largest decrease caused by the Great Recession; for Reading and English-Language Arts, the largest increases due to the Great Recession were in the lower quantiles, while the lowest increases were in the upper quantiles. For Science, the opposite was true; Science had the largest decreases in the upper quantiles and the lowest decreases in the lower quantiles. Trends for Social Studies were ignored and not interpreted due to the lack of statistical significance of the Great Recession in the fixed effects OLS with controls.

The results provide a more nuanced insight of what happens as a result of the Great Recession in Georgia. We see that Title I and Non-Title I Schools have the same effect directions for each test and find distinctions between Elementary/Middle Schools as well as High Schools. With the empirical models, we see how the Great Recession directly influences the pass rates for all Title I CRCT tests except Social Studies along with a more nuanced picture of the varied impact of the Great Recession with respect to each quantile. The broader implication of the work is how it reveals the complex impact of the Great Recession on student learning outcomes; furthermore, it contextualizes the impact on student learning outcomes within NCLB and Georgia. Through the poorer student learning outcomes, students may not develop as strong foundational skills in a subject, thus being harmed in the long run to succeed academically. Also, the results of poorer student learning outcomes may directly punish schools through the failure to meet AYP. Using Georgia as the source of analysis, further facilitates a deeper understanding of the Great Recession of a school positioned similarly to Georgia, both

as a Southern State and as a state on the lower end of educational performance. We argue that the effects of the paper can be applied more broadly because of the Great Recession's wide reaching effects throughout the country. Future directions of the work can extend to a more aggregated level of analysis incorporating different educational structures such as school and state levels. In addition, as future economic downturns occur, we can examine how they also impact education and determine ways to mitigate the effects in the future.

II. Brief Background

A. Georgia Education

Historically, education in Georgia has had unequal outcomes; wealthy whites families sent their kids to the 'Academy' while poor whites occasionally sent their kids to 'Old Field Schools' or not at all in Antebellum period. Slaves were restricted from education opportunities: in 1829, Georgia passed an anti-literacy law that forbade teaching slaves to read or to write (Fields 2004). Following the Civil War, Georgia's Constitution incorporated a provision to provide education to the people; in addition, the state signed into law "An Act to Provide for Education, and to Establish a General System of Georgia Schools" (Orr 1950). Despite the supposed mandates to provide public education, black individuals still suffered tremendous inequalities. Two key court cases exacerbated the inequalities: in *Plessy v. Ferguson* (1896), the courts ruled that separate facilities and accommodations were allowed as long as they were equal; in *Cumming v. Richmond Board of Education* (1899), the courts supported the shutdown of a public high school for black students in order to redistribute the funds for black elementary school students. Jones finds a lack of black high schools in the

period, marking a stark contrast of the opportunities and resources of black segregated schools compared to white schools (1917). In Du Bois's 16th Annual Conference on "The Negro Common School," he demonstrates that the salaries of Atlanta school staff had significant discrepancies between white and black teachers in 1911. Margo's work confirms the inequalities: he identifies the black-to-white ratio of teacher salaries to below one-to-one and demonstrates that Separate-But-Equal kept literacy rates lower than what it would have been if funding was equalized (1990). While the allocation of resources by the government was one component of the inequality, another was what James Anderson terms "double taxation," a system in which blacks had to pay both direct and indirect taxes for their education. While white schools received the resources they needed, black schools had to demonstrate "self-help" by contributing labor and resources; such contributions were their indirect taxes to receive an education (1988).

The explicit inequalities persisted for several decades; black parents, educators, and the NAACP attempted to get all the discrepancy in resources between white schools and black schools addressed (Siddle-Walker 2013). Their work culminated in *Brown v. Board of Education of Topeka* (1954); In Brown, the court ruled that school segregation could no longer continue. Georgia nevertheless resisted; Governor Vandiver declared "Separate Education – Segregated Facilities – are our objectives, first, last, and always" in a speech to members of the Senate and House of the General Assembly (1961). Despite Brown's mandate to integrate with "all deliberate speed," Georgia did not comply; over 100 school districts were litigated for not integrating. Furthermore, many of these court cases continue even in contemporary times (Georgia Advisory Committee to the United States Commission on Civil Rights 2007). The

impact of court ordered segregation, even in the present, represents the legacy of inequalities that continue; it necessitates consideration when examining modern-day school districts.

While considering the legacy of Georgia's history, similar states performed similar actions. Other Southern States had unequal educational outcomes, especially between black and whites. Furthermore, other Southern school districts continue to be litigated for court integration (Qiu, Yue, and Hannah-Jones 2018). Also similar to Georgia, other Southern states tend to perform poorly in Reading and Mathematic scores of the NAEP. These facilitate broader contexts of education.

B. National Education and No Child Left Behind

National Education leading up to NCLB

The role of education in the United States has traditionally been under the purview of the states. The "U.S. Constitution does not mention education, and policymakers at all levels of government interpreted this silence to mean that states and localities should take responsibility for organizing and managing schools" (Rhodes 2012). The role has changed since the 1960s with the passing of the Elementary and Secondary Education Act of 1965 as part of President Lyndon B. Johnson's War on Poverty; provision Title I designated a significant amount of funding to schools and school districts with a high percentage of students from low-income backgrounds. Under the Reagan administration, the report A Nation at Risk *(*National Commission on Excellence in Education 1983*)* was published, alarming the United States to push for drastic improvements in the public education system; this led to a push for standards-based education and called for accountability. George H.W. Bush unveiled a plan called America: 2000 that

attempted to reform education, but ultimately did not passed; Bill Clinton passed Goal: 2000, continuing the trend of the federal role in education while increasing accountability measures (Rhodes 2012). After George W. Bush took office, his landmark education bill quickly took hold: No Child Left Behind.

NCLB

The goal of NCLB is for all students, regardless of background, to reach 100% proficiency in Reading and Math (Bush 2001). The specifics are outlined below: educational agencies are allocated grant money based off the number of children, multiplied by the state's average per-pupil expenditure (§1124(a)(1) and §1124(c)). Additional funding for education is specified by other grants such as Title I; these grants attempt to make education funding more equitable. The additional funding provided by NCLB is not without a

The goal of NCLB is for all students, regardless of background, must reach 100% proficiency by 2014 in reading and math (Bush 2001). It had specifics that are outlined below. Educational agencies are allocated grant money as specified in §1124(a)(1): local educational agencies are eligible to receive funding based off the number of children (§1124(c)) multiplied by state's average per-pupil expenditure. Additional funding is specified by NCLB by other grants or Titles such as Title I. With this funding provided by NCLB, the federal government has also embedded accountability measures to determine whether the funding has gone to waste. A key provision of No Child Left Behind is the mandated Adequate Yearly Progress (AYP) which is a state determined measure of what all local educational agencies must meet with regards to

educational standards in order to be considered meeting AYP. AYP, as specified in §1111(b)(2)(C), indicates that the measure (i) applies the same high standards of academic achievement to all public elementary school and secondary school students in the State; (ii) is statistically valid and reliable; (iii) results in continuous and substantial academic improvement for all students; (iv) measures the progress of public elementary schools, secondary schools and local educational agencies and the State based primarily on the academic assessments described in paragraph (3), which include assessments in mathematics, reading or language arts, and sciences. The initial measurements for the AYP are specified in NCLB §1111(b)(2)(E), in which each state must use data from the 2001-2002 school year to establish the starting point and be based upon whichever is higher of the percentage of students at the proficient level: the State's lowest achieving group of students or the school at the 20th percentile in State among all schools ranked by percentage of students at the proficient level.

NCLB has been the subject of intense criticism; it was supported as the landmark legislation needed to drastically improve America's education to compete in an ever globally competitive market that would uplift all student populations (Ravitch 2013). Further research on the actual policy reveal different insights that are occurring: Darling-Hammond identifies a particularly profound result of the policy. The very students that NCLB claims that it is trying to help, low-scoring students, are pushed out due to the incentive to keep the 'worst' students from preventing AYP to be met (2007). In addition, while some broader research finds improvement in Mathematics prior to the implementation of NCLB, they find no such improvement in Reading (Dee and Jacobs 2010). While the improvement of Math achievement is certainly commendable from the policy implementation, the analysis neglects that studying

tests that are not formally assessed by NCLB. Pederson argues in her paper "What is Measured is Treasured" that the high stakes testing from NCLB actually narrowed testing for non-assessed subjects (2007); the clear incentive is to reduce resources in order to focus more on meeting AYP than 'wasting' students' time and resources on what is deemed less relevant. Darling-Hammond (2007) also calls out the narrowing of curriculum to strictly test-based instruction, especially with regards to tests assessed by AYP. Overall, NCLB has left unforeseen implications compared to when it was originally enacted as legislation.

C. No Child Left Behind in Georgia

The federal laws of NCLB extends funding to Georgia, requiring the state to comply with accountability mandates. As specified by NCLB, each educational agency designs the accountability measure and progress for the AYP goals. Georgia's comprehensive plan is outlined in the state application submitted to the federal government for NCLB; *State of Georgia: Consolidated State Application Accountability Workbook* (2010) breaks down Georgia's implementation of AYP. The core components that go into NCLB's implantation of AYP that are pertinent to this paper are reporting, baseline tests, AYP requirements for each year, determination of whether local educational agency meets AYP, and consequences of failing to meet AYP.

Reporting

Reporting begins once the results of the relevant tests arrive at the Georgia Department of Education (GaDoE). The tests are taken annually in March and provided to the GaDoE in May. Furthermore, Georgia's implantation of NCLB indicates that "All public schools (including public charter schools) and local education agencies are required to make AYP in accordance with Federal requirements". Georgia creates a "report card" for local educational agencies, districts, and public schools to demonstrate that Georgia meets federal requirements. The report card specifies both disaggregated and aggregated data as well as information on student subgroups.

Baseline Tests

AYP requires that schools and local educational agencies be accountable based off standardized tests. Whatever tests end up being used must be consistent with NCLB's AYP requirement. In Georgia, the baseline tests are as follows: Criterion-Referenced Competency Tests (CRCT) in Mathematics, Reading, and English-Language Arts; Georgia's High School Graduation Test (GHSGT) in Mathematics and English-Language Arts; Georgia Alternate Assessment for students with significant cognitive disabilities. The respective scales for students with regards to each assessment are found in **Figure 1**. As specified in NCLB, the starting points for AYP is from 2001-2002. **Figure 2** provides Georgia's initial starting points.

AYP Requirements

After reaching a baseline for Georgia, the following table indicates the Annual Measurable Objectives (AMOS) that Georgia local educational agencies must meet in order to be considered making "Adequate Yearly Progress". **Figure 3** and **Figure 4** indicate what goals

must be met. It must be noted that Georgia combines English and Language Arts, which are actually two separate CRCTs in order to create a single indicator for Elementary and Middle Schools.

Meeting AYP

Georgia's State Accountability System makes determinations annually as to whether local educational agencies have reached AYP goals. The decision flow for making the determination is as follows:

1) Determine whether a subgroup (race, disabilities, immigrants) is at least 40 students
2) Determine whether a subgroup meets the 95% participation requirement in tests related for AYP
3) Determine whether AYP is met regarding the percentage of students that are proficient/advanced compared to Georgia's AMOS for Mathematics, Reading, and English-Language Arts.

When the conditions of AYP are not met, such as 95% participation, or the subgroup requirement of 40 students, a confidence interval will be applied for schools with 10 to 39 full academic year students with their test scores. If the confidence interval indicates that AYP is not met, a multi-year averaging method is used as another computation for a school to reach AYP. Finally, if multi-year averaging does not work, then the "safe-harbor method" is applied; the percentage of students not meeting proficiency must decrease by 10% or more from the preceding year.

Failing to Meet AYP

At a systemwide level, if a school district is unable to meet the AYP goals, the consequences are demonstrated through **Figure 5**. At a school level, if an individual school is unable to meet AYP goals, the consequences are outlined in **Figure 6**.

D. Economic Downturns

Economic downturns have occurred in the past, yet the examination of the impact is limited. Judd documents the "drastic cuts in budgets and salaries … to as much as 25 to 40 percent" while other "schools in a number of states and localities have been closed completely" in the midst of the Great Depression (1933). Attempts to document the Great Recession and impact came from a multitude of education groups. The *American Association of School Administration* report survey results of budget cuts, furloughs, laying off employees, reducing curriculum opportunities (2010). Similar confirmations of the Great Recession are made by the *Kansas Center for Economic Growth* and the *Center for Public Education*; however, their conclusions have been drawn from survey results. Concrete evidence in support of the decrease in school budgets can be found from Chakrabati, Livingston, and Setren in their examination of New York State school district finances and Bhalla, Chakrabati, and Livingston in their comparison of New Jersey and New York's per full-time equivalent. Both results conclusively found that the Great Recession decreased school finances. Evans, Schwab, and Wagner (2014) use aggregated national data as well as school district data to identify that nearly 300,000 teachers and school personnel lost their jobs, schools dependent on state government funds

were particularly vulnerable, inequality in school spending rose sharply during the Great Recession, and that the government's effort to mitigate impact of the Great Recession on education with the American Recovery and Reinvestment Act was successful. While funding and curriculum cuts are certainly proxies for understanding the impact on students, direct quantitative assessments are crucial. Jackson, Wigger, and Xiong focus their work on examining school budget waste and how the Great Recession may have forced cuts on 'wasteful spending'; they find that core operation spending had decreased and report that a 10% school spending cut reduced test scores by about 7.8% of a standard deviation for NAEP data (2018). Their work is certainly part of the beginning steps for assessing the impact of the Great Recession; however, NAEP data is limited in that Math and Reading are primarily measured. Both Math and Reading are assessed by NCLB, failing to reveal what else may be occurring as a result of the Great Recession.

III. Review of Factors Affecting Student Achievement

Overall Districts

Student learning outcomes are highly complex and nuanced; however, the broader district level is more limited in scope of how it can potentially impact student learning outcomes in addition to what is deemed quantifiable. The overall school districts' influential factors can be examined through the classification of district type, the size of the district, and the district level expenditures. The classification of district type is through the degree in which the school districts are considered "urban"; the classification reveals underlying characteristics that can be shared among districts with similar types of classifications. Lankfold, Loab, and

Wyckoff find that nonwhite, poor, and low performing students from urban areas often end up with less qualified teachers in New York (2002). Urban districts have fallen to an abysmal state post Brown v. Board of Education (Blanchett, Mumford, and Beachum 2005) such that they are underfunded and under resourced with larger portions of poor, minority students while suburban school districts are touted as the best academic with wealthy white students. Another key factor found is that primarily black urban districts tend to perform poorly when compared to other school district types; Lleras finds this result by studying national data from the National Educational Longitudinal Study (2008). In addition to distinctions between urban and rural school districts, Reeves discusses the challenges faced by rural districts from demographics to financial characteristics that generally create a lack of accessibility for students as well as a myriad of other issues that rural districts face against No Child Left Behind's accountability (2003). While the degree of which a school district is considered urban is relevant, there is additional relevance in the actual size of the school district. Friedkin and Neccoche (1998) find that students perform better in smaller schools and worse in larger schools and districts, but Diaz finds that there is no significance to district size (2008). the methodology of Diaz is through a regression that include the three variables under study: district size, socioeconomic status, and local property tax rate onto various test scores. The methodology does not properly control for all possible factors that may influence student achievement. The findings of Fowler and Walberg (1991) also appear to contradict Diaz's conclusion; by running a regression that included 23 school characteristics to control for other factors, they find smaller school districts may be more efficient in enhancing educational outcomes. Beyond district sizes, there is a final broad district level factor of school expenditures that are argued to both potentially enhance or

be ineffective in bettering student learning outcomes. Walberg and Fowler (1987) find that expenditure does not significantly impact student achievement. Their work is part of a larger amount of work that argues "money doesn't matter": Hanushek finds that there is no consistent impact of increasing expenditures on student achievement (1989, 1994, 1996). Dee argues that measures such as "per-pupil expenditures" may confound the different effects of resources; he finds a 10% increase in per-pupil non-instructional expenditures implies that graduation rates fall by 3.3% (2005). The overall district level research has other components such as organization structure and district leadership, but no quantitative measurements of such a structure are available.

Students and Class Room

While district level factors are crucial in examining student learning outcomes, broader factors that are salient include teacher quality, socioeconomic status, race, gender, and class sizes. These are factors that pertain to the individual context but can simultaneously be aggregated and studied easily at the school district level. From Lankfold, Loab, and Wyckoff (2002), the most qualified teachers systematically go to more attractive school districts rather than the poor urban districts. Darling-Hammond puts together a comprehensive review of teacher quality in assessing student achievement, finding that teacher quality is positively significant in student learning outcomes (2000). In addition, she notes the potential effect of having teachers that subject matter knowledge and background may play, but highlight that the results are mixed and potentially inconclusive. In a multilevel examination of academic achievement at a student, school, and district level, Caldas and Bankston (1999) find that

student achievement is linked to racial composition, poverty, and family structure. Further work finds similar types of results. In “The Race Gap in Student Achievement Scores: Longitudinal Evidence from a Racially Diverse School District”, Bali and Alvarez (2004) find that achievement gaps develop for both black and Hispanic students. While the race gap exists, it has the potential to continue: Frankenberg and Lee argue that school districts are rapidly resegregating (2002). From what Lleras (2008) finds, the racial segregation is overall detrimental to student learning, at least among 8th and 10th grade students. The racial make-up of the school district plays a further important role. In addition to the racial make-up, gender is a typically included variable; Farkas, Sheehan, and Grobe (1990) find that girls tend to perform better than boys overall and note potential prejudices teachers may have toward one ethnicity than another. It is one of many studies that emphasize the gender differences as well as the potential intersection of gender and race. Finally, long standing arguments of the class size are also emphasized; however, there is some emphasis that class size may not be as important as teacher quality (Sanders & Rivers, 1996; Wright, Horn, & Sanders, 1997). Darling Hammond similarly notes that class size, although sometimes significant, show weaker relationship to student achievement when aggregated to the state level (2000). Overall there are a wide variety of factors at play that influence student achievement. At the school district level, this paper touches on all relevant factors that can be quantified; however, there is so much more that may potentially be unmeasured or occurs at a more granular level.

IV. Data and Methodology

For this analysis, the various data sources are used to compile panel data on Georgia's public school districts. The first data source is the *GaDoE* from the report "Title I Programs Annual Report" using data from 2004-2010. The report cards were unavailable prior to 2004, and for the 2010-2011 school year and beyond, a new mathematics test was administrated (U.S. Department of Education 2010), which would change the basis of comparison. While the window of time for evaluation is relatively brief, the 180 school districts over a course of 6 years provide sufficient amount of data. Another key limitation of the data set is the restriction to the school district level– individual schools shifted between Title I and Non-Title I status over time. Although the exact effect of the change is unknown on whether it was primarily Elementary and Middle Schools or High Schools, the potential implications of such a shift are changes in test score pass rates, the dependent variable of study. One year of individual school data is collected from 2008-2009 to provide some limited additional information. The report contains detailed information on school districts across school years including the following: percentage of students that are economically disadvantaged, or on free/reduced lunch, pass rates for CRCT and GHSGT for Title I and Non-Title I schools.

The next data source is pulled from the *National Center for Education Statistics* in which the Common Core of Data is used. The Common Core of Data surveys school districts throughout the country; however, the data is pulled specifically for Georgia school districts. In this analysis, we pull the number of teachers in each school district from the Common Core of Data. In addition, the *National Center for Education Statistics* has another data set called the "District Universe Files," which are used for the classification of school districts in to "City",

"Town", "Suburbs", or "Rural" districts. We incorporate the relevant school district classifications as how "urban" a particular school district is.

The analysis also incorporates expenditure data collected from the *GaDoE*. The "Quality Basic Education Reports" from 2004-2010 report information on school district teacher experience, revenue, and enrollment by gender and race. The data from the "Quality Basic Education Reports" do not precisely align with the "Title I Programs Annual Report"; however, they do fall within the same academic year. While it does contain information on what percentage is funded by the federal, state, and local levels, the analysis only uses the per student Full Time Equivalent (FTE), which measures the average funding per full time student.

In addition to the previous data sources, we make use of information available from the Georgia Advisory Committee to the United States Commission on Civil Rights as well as ProPublica. These data sources provide further data points on the history of the respective school districts and whether they were litigated in the past for court ordered integration. The Georgia Advisory Committee to the United States Commission on Civil Rights is conducted in 2007, and the initial data points come from that data set. The ProPublica data source provides the remaining pieces of information on when some school districts were declared to be unitary status.

The final data source used is through the St. Louis Federal Reserve for unemployment and median income. The data is reported on a yearly basis for each Georgia county. The data does possess an inherent limitation: most school districts are countywide; however, there are independent school districts that exist tied strictly to a city. The independent school districts are adjusted to match the unemployment and median income of the county in which they

reside in. If an independent school district resides in more than one county as some do, the county in which the majority portion of the city is contained in is used.

A summary of the definitions of all pertinent variables can be found in the **Appendix Definitions**. In addition, the descriptive statistics of each variable can be found in **Table 1**.

Hypothesis Tests

A series of hypothesis tests are conducted to compare student learning outcomes, proxied through subject pass rates, before the Great Recession and after the Great Recession. The motivation for using hypothesis tests are due to the restrictions imposed by the data; the shifts of Non-Title I Schools to Title I Schools creates not missing at random data that needs to be removed from the analysis. The systematic way in which the day is missing would bias a regression model as well as any potential testing done. The hypothesis test, recognized as falling under the same purview of bias, is intended to strictly attempt to measure effect direction. The full extent of the removal on the number of school districts as a result is found in **Table 2**.

The hypotheses, summarized in **Table 3**, are divided into Elementary/Middle Schools and High Schools, Title I and Non-Title I Schools, and tests related to AYP and tests unrelated to AYP. The 2004-2005, 2005-2006, and 2006-2007 school years are averaged to construct the "Before the Great Recession," while the 2008-2010 school years are averaged to construct the "After the Great Recession" data. Each hypothesis test examines whether there is a difference in means between "Before the Great Recession" and "After the Great Recession" for the average percent test pass rate using a Dependent T-Test for test pass rates that were normally

distributed and a Wilcoxon-Mann-Whitney Test for non-normally distributed test pass rates. The determination of each test pass rate's normality can be found in **Table 4** and **Table 5** as well as **Figures 7-24**. The overall classification is found in **Table 6**.

Empirical Models

The empirical models utilized determine the impact of the Great Recession on Title I Schools for each Math, Reading, English-Language Arts, Science, and Social Studies pass rates. A dummy variable was created for the Great Recession, specifying the 2008-2010 school years as the years of impact. Using Title I Schools' test pass rates as the dependent variables, several regressions were conducted to gauge the impact of the Great Recession. A simple OLS regression was conducted in order to provide a baseline effect of the Great Recession. Next, an OLS regression with control variables incorporated was used to assess the effect of the Great Recession after accommodating all potential factors that influence test pass rates. Finally, a quantile regression with control variables incorporated was used to gauge the differentiated impact of the Great Recession among the 10%, 25%, 50%, 75%, and 90% quantiles. The regressions are respectively specified in *Model 1*, *Model 2*, and *Model 3*. Y_{it} is a vector specifying the following test pass rates: Title I CRCT Math, Title I CRCT Reading, Title I CRCT English-Language Arts, Title I CRCT Science, and Title I CRCT Social Studies.

Although the literature review compiled a comprehensive list of possible factors that explain student learning outcomes at the aggregated school district level, the school learning outcomes are highly nuanced and complex. The analysis incorporates fixed effect models, which assumes that unobservable factors are time-invariant, to account for issues of omitted

variables, or misspecification, given the nuanced and complexity of assessing student learning outcomes. The fixed effects model is applied to the simple regression to develop a new baseline effect of the Great Recession, which is specified in *Model 4*. Finally, *Model 5* applies the fixed effect model to the regression while incorporating control variables to assess the effects of the Great Recession after accommodating the potential factors found in the literature review that impact student learning outcomes. The fixed effects model was not applied to the quantile regression because the techniques for such are still under development (Angrist, Chernozhukov, Ferandez-Val 2004). μ_Y specifies the population mean of the test pass rate, while each μ iteration specifies the population mean of the Great Recession as well as the control variables and error term.

Model 1 (Simple OLS) (1)

$$Y_{it} = B_o + B_1(\text{Great Recession}) + \varepsilon$$

Model 2 (OLS with Controls) (2)

$$Y_{it} = B_o + B_1(\text{Great Recession}) + B_2(\text{Median Income}) + B_3(\text{Unemployment}) + B_4(\text{Per FTE Total}) + B_5(\text{Schools}) + B_6(\text{Class Size}) + B_7(\text{Training and Experience}) + B_8(\text{Desegregation Status}) + B_9(\text{Urbanization}) + B_{10}(\text{White Percentage}) + B_{11}(\text{Female Percentage}) + B_{12}(\text{Economically Disadvantaged Percentage}) + B_{13}(\text{Title I Percentage}) + B_{13}(\text{Median Income X Unemployment}) + B_{14}(\text{Schools X Class Size}) + B_{15}(\text{Schools X Urbanization}) + B_{16}(\text{Schools X Title I Percentage}) + B_{17}$$

(Class Size X Economically Disadvantaged Percentage) + B_{18}(White Percentage X Economically Disadvantaged Percentage)+ B_{19}(White Percentage X Female Percentage) + ε

Model 3 (Quantile Regression with Controls)

Q_θ(Pass Rate % | *z*) = $z\beta(\theta)$ (3)

$n^{-1} \sum \rho_\theta$(Pass Rate $\%_i$ - $z_i\beta$) (4)

ρ_θ = {$\theta\mu$ for $\mu \geq 0$ } (5)

{$(\theta-1)\mu$ for $\mu < 0$ }

Q_θ(Pass Rate % | z) for $\theta \in (0,1)$ denotes the θth quantile distribution of the Pass Rate %, given z, a vector of the control variables found in the **Appendix**. β(θ) is the vector of quantile regression coefficients. For given $\theta \in (0,1)$, β(θ) is estimated by minimizing β using (4) and (5).

Model 4 (Simple Fixed Effects)

$Y_{it} - \mu_Y = B_o + B_1(Great\ Recession - \mu_{Great\ Recession}) + (\varepsilon - \mu_\varepsilon)$ *(6)*

Model 5 (Fixed Effects with Controls) *(7)*

$Y_{it} - \mu_Y = B_o + B_1(Great\ Recession - \mu_{Great\ Recession}) + B_2(Median\ Income - \mu_{Median\ Income}) + B_3(Unemployment - \mu_{Unemployment}) + B_4(Per\ FTE\ Total - \mu_{Per\ FTE\ Total}) + B_5(Schools - \mu_{Schools}) + B_6(Class\ Size - \mu_{Class\ Size}) + B_7(Training\ and\ Experience - \mu_{Training\ and\ Experience}) + B_8(Desegregation\ Status - \mu_{Desegregation\ Status}) + B_9(Urbanization - \mu_{Urbanization}) + B_{10}(White\ Percentage - \mu_{White\ Percentage})$

$+ B_{11}(\text{Female Percentage} - \mu_{\text{Female Percentage}}) + B_{12}(\text{Economically Disadvantaged Percentage} - \mu_{\text{Economically Disadvantaged Percentage}}) + B_{13}(\text{Title I Percentage} - \mu_{\text{Title I Percentage}}) + B_{13}(\text{Median Income X Unemployment} - \mu_{\text{Median Income X Unemployment}}) + B_{14}(\text{Schools X Class Size} - \mu_{\text{Schools X Class Size}}) + B_{15}(\text{Schools X Urbanization} - \mu_{\text{Schools X Urbanization}}) + B_{16}(\text{Schools X Title I Percentage} - \mu_{\text{Schools X Title I Percentage}}) + B_{17}(\text{Class Size X Economically Disadvantaged Percentage} - \mu_{\text{Class Size X Economically Disadvantaged Percentage}}) + B_{18}(\text{White Percentage X Economically Disadvantaged Percentage} - \mu_{\text{White Percentage X Economically Disadvantaged Percentage}}) + B_{19}(\text{White Percentage X Female Percentage} - \mu_{\text{White Percentage X Female Percentage}}) + (\varepsilon - \mu_{\varepsilon})$

V. Results

Hypothesis Testing

The results of the Hypothesis Test are summarized in **Table 7**, which provide further information on whether the method was a Dependent T Test or a Wilcoxon-Mann-Whitney Test, the test statistic of the hypothesis test, and the p-value.

For Hypothesis 1(a), we reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for Title I CRCT Math; however, we fail to reject the null hypothesis for Title I CRCT Reading and Title I CRCT English-Language Arts. The conclusion of Hypothesis 1(a) indicates a varied impact of the Great Recession even among tests that are assessed by AYP. The mixed impact does not support the idea that the Great Recession had caused an overall decrease for Title I Schools even for tests that are assessed by AYP.

For *Hypothesis 1(b),* we reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for both Title I CRCT Science and Title I CRCT Social Studies. The conclusion of the hypothesis test conducted for Hypothesis *1(b)* supports the idea that Title I Schools suffer for tests that are not assessed by AYP.

For *Hypothesis 2(a),* we fail to reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for Non-Title I CRCT Math. For Non-Title I CRCT Reading and Non-Title I CRCT English-Language Arts, we reject the null hypothesis, indicating a significant increase in average percentage of students that passed when comparing before and after the Great Recession. The results do not conclusively support that Non-Title I Schools had an overall increase in test pass rates related to AYP.

For *Hypothesis 2(b),* we reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for both Non-Title I CRCT Science and Non-Title I CRCT Social Studies. The conclusion of the hypothesis test conducted for *Hypothesis 1(b)* supports the idea that Title I Schools would suffer for tests that are not assessed by AYP.

While Title I and Non-Title I Elementary and Middle School pass rates cannot be directly compared due to the data limitation as well as the potential bias caused by the non-missing at random data values that were removed, it is interesting to see similarities before and after the Great Recession when examining the same tests. This observation is made with reservations since the bias of the non-missing at random could skew the overall direction of the Non-Title I Elementary and Middle Schools. No matter whether the students are from schools classified as

Title I or Non-Title I, the overall school district pass rates demonstrate that Math, Science, and Social Studies decrease on average while Reading and English-Language Arts increase on average.

For *Hypothesis 3(a),* we fail to reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for Non-Title I GHSGT Math; however, we reject the null hypothesis for Non-Title I GHSGT English-Language Arts, indicating a significant decrease in average percentage of students that passed when comparing before and after the Great Recession. The conclusion of *Hypothesis 3(a)* indicates a mixed impact of the Great Recession on the tests assessed by AYP; however, the results flipped. They do not conclusively indicate that Title I High Schools had an overall decrease for test pass rates related to AYP.

For *Hypothesis 3(b),* we fail to reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for both Non-Title I GHSGT Science and Title I GHSGT Social Studies. The conclusion for the hypothesis test conducted for *Hypothesis 3(b)* directly contradicts the idea that Title I Schools would suffer in student learning outcomes for tests that are not assessed by AYP.

For *Hypothesis 4(a)*, we reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for Non-Title I GHSGT Math, indicating a significant increase in average percentage of students that passed when comparing before and after the Great Recession.; however, we fail to reject the null hypothesis for Non-Title I GHSGT English-Language Arts. The conclusion of *Hypothesis 4(a)* indicates a mixed impact of the Great Recession on the tests assessed by AYP; however, the results flipped.

They do not conclusively indicate that Title I High Schools had an overall decrease for test pass rates related to AYP.

For *Hypothesis 4(b)*, we fail to reject the null hypothesis that the average percentage of students that passed is the same before and after the Great Recession for both Non-Title I GHSGT Science and Title I GHSGT Social Studies. The conclusion for the hypothesis test conducted for *Hypothesis 4(b)* directly contradicts the idea that Title I Schools would suffer in student learning outcomes for tests that are not assessed by AYP.

Similar to the situation of Title I and Non-Title I Elementary and Middle Schools, the Title I and Non-Title I High Schools cannot be directly compared due to data limitations as well as the potential bias caused by the non-missing at random data values that were removed; however, they demonstrate similar trends when comparing the same test before and after the Great Recession. Math and Science pass rates increase on average, English-Language Arts decreases on average, and Social Studies appears to not have changed at a statistically significant level on average.

Overall, the hypothesis test results do not match up to the broader hypotheses that Title I Schools will systematically suffer due to the Great Recession regardless of whether the test is assessed by AYP; similarly, Non-Title I Schools are not consistently improving test pass rates even during the Great Recession. There are also distinctions between how Elementary and Middle Schools were impacted by the Great Recession when compared to High Schools. Even if the conclusion reached is that tests assessed by AYP is mixed, Elementary and Middle Schools had significantly lower Math pass rates on average and significantly higher Reading and English-Language Arts on average, while High Schools had the opposite for before and after the Great

Recession. The differences from Elementary, Middle, and High Schools also lead to an overall mixed result of tests not assessed by AYP: Elementary and Middle Schools had significantly lower pass rates on average for both Science and Social Studies; however, High Schools had significantly higher Science pass rates on average and no statistically different Social Science pass on average when comparing before and after the Great Recession. Possible explanations are subsequently explored in the **Discussion** section.

Empirical Models

The results of *Model 1* are reported on **Table 8**, results of *Model 2* are reported on **Table 9**, and results of *Model 3* are reported on **Table 10, 11, 12, 13,** and **14**. The simple OLS from *Model 1* indicates that the Great Recession was statistically significant among Reading, English-Language Arts, Science, and Social Studies at a 5% significant level for Title I CRCT pass rates. The exception to the statistical significance is Math pass rates for Title I CRCT.

The Math pass rate has a negative sign in the simple OLS model with a relatively small effect compared to the other tests; however, the simple OLS model shows that the Great Recession has potentially large effects for test pass rates that are statistically significant. the Great Recession has an average impact of increasing Reading pass rates by 5.587% and English-Language Arts by 4.571% compared to the before the Great Recession period. A percentage pass rate increase of that magnitude may boost schools enough to meet AYP goals; to put the magnitude size in context, the previous percentage pass rate increase was 6.60% for Reading/ English-Language Arts– the Great Recession increase is extremely close. In contrast, the potentially large effect for the Great Recession occurs in the negative direction for both Science

and Social Studies. Although Science is not accessed through AYP, the -4.470% average pass rate decrease due to the Great Recession compared to pre-recession levels is similar in magnitude to English-Language Arts, indicating a potentially large effect size. The impact of the Great Recession on Social Studies greatly exceeds the other tests; the -13.359% average pass rate decrease due to the Great Recession compared to pre-recession pass rates is several times larger than the other effect sizes, furthermore, the negative sign emphasizes the large potential economic downturns can have on student learning outcomes. The initial examination of the Great Recession without control variables serve as a baseline in contextualizing the impact before the other factors are accounted for.

The addition of control variables in *Model 2* causes several deviations from the simple OLS model. The statistical significance and signs of the effects remain the same among the variables even after incorporating control variables into the analysis with the exception of Math, which becomes statistically significant. The magnitudes fluctuate drastically for some tests while barely adjusting for others. For Math, the occurrence of the Great Recession caused a -3.555% average pass rate decrease for school districts, when compared to the simple OLS model, it is nearly a 400% change from the original statistically insignificant magnitude of -.990% on average. Another test that had a drastic increase in magnitude was Science; *Model 2* adjusted the impact of the Great Recession to -7.369% pass rates on average from the simple OLS model's -4.470% pass rate on average. The magnitudes Title I CRCT Reading is relatively similar when comparing the 5.587% pass rate increase on average from *Model 1* to *Model 2's* 5.277% pass rate increase on average. Finally, the magnitudes of both Title I CRCT English-Language and Social Studies decreased; the change for English-Language Arts was slightly below

a 1% average pass rate decrease with the additions of the control variable, making the impact of the Great Recession go from 4.571% average pass rate increase to 3.602% average pass rate increase. Social Studies experienced a much drastic shift from *Model 1* to *Model 2*: the pass rate decrease went from -13.359% on average to -4.108% on average. In addition, the control variables varied in statistical significance; only Per FTE and the interaction between White Student Percentage and Economically Disadvantaged % had consistently been statistically significant in all tests. Another key note is that relative to the control variables, the Great Recession had an effect size that is greater than most other variables with the exception of City dummy variable in most scenarios and White Student percentage. While *Model 2* provides a more realistic depiction of the impact compared to *Model 1*, *Model 3* using quantile regression will facilitate further insights.

In the quantile regression conducted, the Great Recession is reported to be statistically significant among all quantiles used in the regression. The overall economic signs remain the same to the simple OLS model as well as the OLS model with controls. The magnitudes produced from *Model 3* change compared to *Model 2*, especially since the use of quantiles provide a more nuanced picture of how the Great Recession impacted Title I CRCT pass rates. For Math average pass rate decrease from the Great Recession, the magnitudes are smaller for the 10% and 90% quantile compared to the magnitude from *Model 2*, while the 25%, 50%, and 75% quantiles all have greater magnitudes than *Model 2*. School districts that were either in the lower or upper end of Math had a smaller impact than those in the middle. Among Title I CRCT Reading pass rates, the 10% and 25% quantiles had larger magnitudes than the OLS model with controls, while the 50%, 75%, and 90% quantiles had smaller magnitudes. Another core

component to note is that another trend emerged: there is a decreasing impact of the Great Recession's average pass rate increase as school districts fall into middle and upper end of the distribution. English-Language Arts is similar to Reading in that both the 10% and 25% quantiles have larger magnitudes than the OLS models with control and the same trend with the exception that the 90% quantile is slightly higher than the 75% quantile, but both are much lower than the 10% quantile. The Great Recession appears to be disproportionately benefit the school districts that have the lowest pass rates for Reading and English-Language Arts. Although both Science and Social Studies decreased pass rates on average due to the Great Recession, they have opposite trends. Science has the middle and upper quantiles with average decrease magnitudes greater than the magnitudes from *Model 2*, while Social Studies has the lower and middle quantiles with average decrease magnitudes greater than the magnitude from *Model 2*. As school districts go from lower quantiles to higher quantiles, Science pass rates decrease at larger magnitudes, meaning the Great Recession, on average, impacted Science pass rates more for school districts that had pass rates that were higher. Social Studies is the opposite in that as school districts go from the lower quantiles to the upper quantiles, pass rates decrease at smaller magnitudes. The significance of such is that the Great Recession had an average impact on Social Studies pass rates at the school districts that were already on worse performing. Overall the addition of Per FTE and Training and Experience are statistically among all of the variables, while the remaining controls varied in significance depending on the test. Some interesting controls that are significant are the dummy variables for court ordered integration, which has a negative direction, and unitary status, which has a positive direction; they both

have effect sizes that are roughly 1% average pass rate change, when they are significant. This may indicate to small degree that historical backdrops play.

As noted previously in the *Empirical Models* section, the complexity of student learning outcomes combined with misspecification calls for the addition of a fixed effects model; the results of *Model 4* can be found in **Table 15**, and the results of *Model 5* can be found in **Table 16**. From *Model 4*, the effect size and effect directions are similar to *Model 1*. When the control variables are added to the fixed effect model, *Model 5* deviates from the baseline established in *Model 4*, furthermore, certain effect magnitudes deviate from *Model 2,* but the overall effect direction remain consistent with all other models. For Title I CRCT Math pass rates, the effect size is several times larger than the baseline from *Model 4*, similar to the effect changes that occurred when comparing *Model 1* to *Model 2*; however, the effect size for *Model 5* is larger than *Model 2* with a -4.391% change in average pass rate compared to -3.555% change in average pass rate. Overall, the impact of the Great Recession on Title I CRCT Reading pass rates remained relatively similar before and after the fixed effects adjustment with differences between *Model 1* and *Model 4* coefficients to be .002 and differences between *Model 2* and *Model 5* coefficients to be .013. When examining Title I CRCT English, the magnitude of the fixed effects model with controls is smaller than the OLS model with controls; there is decrease of magnitude from 3.602% on average in *Model* 2 to 3.020% on average in *Model 5*. In Title I CRCT Science and Title I Social Studies pass rates, the impact of the Great Recession had greatly been mitigated when incorporating a fixed effects model; the magnitude size of the Great Recession's impact on Title I CRCT Science pass rates decreased from -7.369% on average to -3.254% on average, cutting the magnitude nearly in half. The impact of the Great Recession on

Title I CRCT pass rates when applying fixed effects model is nearly ¼ of the impact when no fixed effects are applied, and the Great Recession is no longer deemed even statistically significant. Also, in contrast to *Model 4*, only the percentage of Title I Schools was statistically significant in the fixed effects model for all tests. The overall application of the fixed effects models helped shape a more robust model such that the Great Recession is still considered impactful even under potential misspecification for all student learning outcomes except social studies.

VI. Discussion

As mentioned previously, the hypothesis tests are useful in establishing a rough baseline of the impact of the Great Recession's direction. Recognizing that the data limitations along with the potential bias from non-missing at random exists, we cautiously make assertions because we do not necessarily suspect that the school districts that remain are completely unrepresentative of the broader trends ongoing as a result of the Great Recession. With that in mind, the hypothesis tests reveal results that do not necessarily match up to some of the broader hypotheses. Title I Schools do not appear to systematically suffer from the Great Recession, nor do Non-Title I Schools seem to be more resilient from the impact of the Great Recession. For both Title I and Non-Title I Schools, they possessed similar broader trends for each of the tests pass rates examined under hypothesis testing from before and after the Great Recession. Although Title I and Non-Title I Schools are not directly comparable with one another to directly assess whether they were impacted to the same degree due to the limitations previously mentioned, the effect directions remain the same.

In a further drill down of the Great Recession impact, whether the test is assessed for AYP purpose have overall mixed results. Among Elementary and Middle Schools, Math continues to decrease for both Title I and Non-Title I Schools while Reading and English-Language Arts increase; in contrast, both Science and Social Studies have significant pass rate decreases. The Science and Social Studies pass rates for Elementary and Middle Schools appear consistent with common criticisms of NCLB that resources do get focused toward tests that are assessed by AYP, given that the Great Recession leads to a drop in school resources, that decrease may be funneled toward Math, Reading, and English-Language Arts. The shift in resources even towards tests assessed by AYP may have a mitigating effect on those particular tests; however, it does not explain why Reading and English-Language Arts pass rates increase after the Great Recession while Math pass rates do not. A possibility for why Reading and English-Language Arts pass rates have an overall increase while Math does not may be due to existence of extensive supplemental initiatives: "Early Reading First" and "Reading First" were two new literacy initiatives for young children introduced by NCLB (NCSL n.d), and they received additional budgetary support in 2005-2006 school year (U.S. Department of Education 2005). Given the focus on young children, the positive effects of the additional budget support may manifest when the children reach 3rd grade, the year in which CRCT pass rates are counted for AYP; a child that started Kindergarten in 2005-2006 would begin being assessed in the 2008-2009 school year, and a child that started 1st Grade in 2005-2006 would begin being assessed in the 2007-2008 school year. Math did not receive an equivalent boost until the 2006-2007 school year with several new initiatives developed like "Math Now," but reading programs simultaneously received increased funding as well (U.S. Department of Education 2006). The

students benefiting from the math initiative may also see delayed effects from the time spent to develop and implement the new program, thus delaying the overall reflection in Math test pass rates. The Math test pass rate significant average decrease could then be attributed to the Great Recession.

While Elementary and Middle Schools appear to follow the idea that budgetary restrictions shift resources toward tests assessed by AYP, High Schools do not see a similar result. Instead, Math and Science pass rates appear to significantly increase on average in the time period while Social Studies does not have significant changes, and English-Language Arts has significant decreases on average. An underlying factor of the hypothesis tests is the shift from Non-Title I Schools to Title I Schools during the Great Recession period, which serves as a component of the possible explanation of why High Schools' respective pass rates ended up differently that Elementary and Middle Schools. The shift from Non-Title I to Title I has a twofold effect: with Non-Title I Schools generally performing better than Title I Schools, the shift increases the overall average of the Title I Schools; simultaneously, since the classification of Title I is a reflection of the overall student incomes (40% on free/reduced lunch determines Title I Status), the schools that remain as Non-Title I classification would be the schools with wealthier students, who are more likely to perform better on tests. While the same concept may potentially apply both Elementary and Middle Schools as well as High Schools, the overall number of schools that are Elementary and Middle Schools differ from High Schools as well as the overall percentage of Title I Schools, as seen in **Table 17**. In the 2008-2009 school year, there were 1790 Elementary and Middle Schools with 65.9% of them classified as Title I; in contrast, there were 363 High Schools with 25.6% of them classified as Title I. While individual

test pass rates were not available, we see that the respective percentages that met AYP is different, with 88.5% of Title I Elementary and Middle Schools meeting AYP compared to 35.8% of Title I High Schools meeting AYP. In addition, we see that 93.7% of Non-Title I Elementary and Middle Schools that met AYP as 93.7% and Non-Title I High Schools that met AYP as 64.4%. We reasonably assume that even if resources are allocated to tests assessed by AYP, the original test pass rates for schools that met AYP was higher than test pass rates of schools that did not meet AYP. The effect of a shift of Non-Title I Schools to Title I Schools would have a more distinctive impact for High Schools given that there are so much fewer Title I schools as well as fewer that met AYP than Elementary and Middle Schools. This shift may indicate why Social Studies pass rates have no statistically significant changes even despite resources not going towards the program. For Math and Science, the combination of the shifts from Non-Title I to Title I along with the increased funding for STEM education from the $120 million Secondary Mathematics Initiative (U.S. Department of Education 2005) and $380 million to improve math and science instruction (U.S. Department of Education 2006) could explain why the pass rates for Math and Science increased in the time period instead of having no statistically significant changes or decreased. Even despite the shift, English-Language Arts had significant decreases for both Title I and Non-Title I Schools; similar to Math in Elementary and Middle Schools, the Great Recession simply had a significant negative direction impact on test score pass rates for English-Language Arts.

To extend beyond the hypothesis tests, empirical models are used for Title I CRCT test pass rate. The empirical models confirm the same effect directions as the hypothesis tests; however, they further assist in teasing out the nuances of the effect of the Great Recession. The

initial baselines established from both *Model 1* and *Model 4* both indicate the same effect directions; however, the magnitudes change when controls are incorporated into the models, as found in *Model 2* and *Model 5*. Furthermore, under the examination of different quantiles through *Model 3*, there appears to be a differentiated impact of the Great Recession. While overall we do not consistently see a decrease of all test pass rates from the Great Recession, the various funding additions as well as the focus toward tests that are assessed by AYP provide explanations for why that may occur. What is especially key to note is what occurred in *Model 3* and *Model 5*. Although *Model 3* does not control for misspecification, it is still reasonable to utilize; even using *Model 5*, we find that the combination of both fixed effects with the control variables indicate statistical significance for the Great Depression variable in Title I CRCT Math, Reading, English-Language Arts, and Science – the only exception was Title I CRCT Social Studies pass rates. *Model 5* does indicate further changes in average effect size, especially for Math, English-Language Arts, and Science; however, that would not necessarily invalidate the overarching trends that are happening when examining the various quantiles with the exception of Social Studies due to the lack of statistical significance. The differentiation of the impact of the Great Recession along with the subsequent trends are actually quite promising for Reading and English-Language Arts: they both have a positive direction in terms of the impact of the Great Recession, and the Great Recession has an increasing trend such that school districts that were on the lower quantiles had higher average pass rates increases than school districts on the upper quantiles. The broader implication of the result is that although those school districts, particularly at the lower end, may not be doing well relative to other school districts, the time period in which the Great Recession occurred ushered in

disproportionately more increases to pass rates on average for those respective tests. The trend would actually serve to decrease the gap between the top performing school districts and the worst performing school districts, helping further reduce the gap in student learning outcomes. The trend that occurs in Science pass rates also reduces the gap between top performing school districts and the worst performing school districts but in a manner that is not beneficial to society: Title I CRCT Science pass rates have significantly larger decreases in the upper quantiles than the lower quantiles. Math pass rates also had a significant decrease but had lessened effects on both the 10% and 90% quantiles; the bulk of the schools from the 25% to 75% quantiles had much larger decreases. The overall decrease in student learning outcomes for Science and Math are particularly worrisome; American society has placed a greater emphasis on STEM education in order to compete in an ever more competitive global economy, and with the Great Recession's impact, students are unable to meet that. The impact doesn't stop there: the skills built in Math and Science during Elementary and Middle School serve as the foundation for learning future Math and Science. Students that may have been pushed out of schools as Darling Hammond (2000) mentioned, may suffer even further than what the test pass rates indicate.

Although the analysis focuses explicitly on student learning occurs as proxied by test pass rates, there is a broader impact because the Great Recession occurred when No Child Left Behind was under effect– Schools still had to meet AYP goals. The failure to do so still resulted in imposed consequences with increasing harsh results for schools that missed AYP in previous years. No position is taken on whether the consequences of allowing school choice or restructuring a school is beneficial or hurtful to student learning outcomes; however, the Great

Recession had an indirect impact on reaching those imposed consequences. With the Great Recession indicating a significant decrease on Math pass rates, and Math pass rates tied to AYP, schools may not have sufficiently reached the score to meet AYP. No individual school level data is used in the analysis to confirm, but if a school was not performing to par to meet AYP prior to the Great Recession, it is logically unlikely that it will do so once the Great Recession occurs. Furthermore, the extensive time period in conjunction with the slow recovery of schools from the Great Recession increases the possibility that schools may continue to not have met AYP, receiving harsher consequences as a result.

While the data under analysis is strictly Georgia, the impact of the Great Recession is certainly extendable to other states given how devasting it was to the entire country. Although each state may have felt a distinctive impact given its own respective education context, the results found in Georgia may be comparable to states that share similar key characteristics to Georgia: Southern states that fall on the lower end of educational performance as measured by the NAEP. From the Georgia analysis, we find instances in the quantile model in which the dummy variable for court ordered integration and unitary status as significant; the effect of the court ordered integration control variable had a negative effect direction while the unitary status variable had a positive effect, an indication that the broader legacy of inequalities come into play even while examining the Great Recession.

VII. Conclusion

From examination of Georgia's aggregated school district data, we find that the Great Recession is impactful. The paper reveals results that facilitate a more nuanced understanding

of the Great Recession that hasn't yet been thoroughly examined. In a limited manner, we find that Title I and Non-Title I Schools had similar overall effect directions, yet the results were simultaneously counterintuitive due to the statistically significant increases found for some Reading and English-Language Arts for Elementary and Middle Schools as well as Math and Science for High Schools. We explain the addition of funding sources as reasons to influence the increase in pass rates even despite an economic crisis as devastating as the Great Recession. Furthermore, we identify the data limitation of the shifts of schools from Non-Title I to Title I as a potential factor that influenced Social Studies to have no statistically significant change before and after the Great Recession. In addition to the hypothesis tests conducted, the empirical models better our understanding of the extent in which the Great Recession had influenced the various pass rates for each test. The empirical models confirmed similar effect directions as the Hypothesis tests, yet it did not find statistical significance for the impact of the Great Recession on Social Studies pass rates after accounting for all possible controls along with bias from misspecification. The magnitude of the effects of Great Recession's impact, from the fixed effects model with controls, are in a large enough range to potentially whether AYP is met. The broader connection is such that with the magnitude of the effect sizes sufficiently large, especially for Math, which is assessed by AYP, schools could potentially be moved towards "Needs Improvement". The escalation of punishments is similarly possible due to the long-term effects of the Great Recession that extend beyond even the immediate Great Recession period. Punishments are one aspect. The fundamental broader impact of the Great Recession is the harm it places on student learning outcomes: skills developed in any subject matter serve as the foundation for future learning; students are hurt when they have weaker educational

foundations. Further research on the impact of the Great Recession, or any economic downturn, is crucial in order to support the development of the necessary policies and legislation to mitigate the effects felt from the Great Recession. Further extensions may be to also incorporate more granular data from individual schools; the data limitations at the school district level with the shift from Non-Title I to Title I Schools could be addressed. Finally, with the addition of all the additional layers into the analysis, a hierarchical linear modeling technique could be applied, revealing the Great Recession's impact at the individual level while incorporating factors of the broader structures of each educational context.

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IX. Appendix

Section 1: Data

Definitions

Dependent Variables:

Title I CRCT (Math/Reading/English-Language Arts/Science/Social Studies): The percentage of students in Title I schools within the school district that passed the CRCT for the respective tests of Math, Reading, English-Language Arts, Science, or Social Studies.

Non-Title I CRCT (Math/Reading/English-Language Arts/Science/Social Studies): The percentage of students in Non-Title I schools within the school district that passed the CRCT for the respective tests of Math, Reading, English-Language Arts, Science, or Social Studies.

Title I GHSGT (Math/English-Language Arts/Science/Social Studies): The percentage of students in Title I schools within the school district that passed the GHSGT for the respective tests of Math, English-Language Arts, Science, or Social Studies.

Non-Title I GHSGT (Math/English-Language Arts/Science/Social Studies): The percentage of students in Non-Title I schools within the school district that passed the GHSGT for the respective tests of Math, English-Language Arts, Science, or Social Studies.

Independent Variable

Great Recession: A dummy variable that indicates with a "1" the Great Recession period in the 2008-2010 school years.

Control Variables

School District: All School Districts in Georgia starting from 2004 (Excluding Atlanta Public Schools)

Median Income: The median income at a county level. School districts that are not county based, such as independent city school districts, use the median income for the county in which they reside. For non-county school districts that reside in multiple counties, the income of the majority residing district is used.

Unemployment: The unemployment rate at a county level. School districts that are not county based are adjusted similarly to *Median Income*. The county unemployment rate for which the majority of the residing school district falls under is used.

Per FTE: The average amount of money spent for a full time equivalent student

Schools: The total number of schools in a school district

Class Size: The number of students that are in a class, on average, in a school district. This variable is computed by taking the total amount of teachers divided by the total amount of students in the school.

Training and Experience: Teacher's training and experience at a school district level. Training and Experience is used to grant additional funds for Quality Basic Education funding. https://law.justia.com/codes/georgia/2010/title-20/chapter-2/article-6/part-4/20-2-161/

Status: Status of whether a school district has not been litigated in the past for court ordered integration, been litigated and remains litigated during the time period of 2004-2010, or litigated and declared integrated (unitary status).

Urbanization: Classification of whether the school district is in a city, town, suburb, or rural area

White Percentage: The percentage of the school district students that identifies as white or Caucasian.

Female Percentage: The percentage of the school district students that identify as female

Economically Disadvantaged: The percentage of students in the school district eligible for free or reduced-price lunch

Title I Percentage: The percentage of schools in the school district that are classified as "Title I" schools. Variable is constructed from the count of Title I schools in the districted divided by the total count of schools in the district.

Descriptive Statistics

Descriptive statistics

Statistic	N	Mean	St. Dev.	Min	Max
Title.I.CRCT.Math	1,073	79.4	8.5	0.0	97.0
Title.I.CRCT.Reading	1,073	87.8	6.8	0.0	98.5
Title.I.CRCT.English.Language.Arts	1,073	84.5	6.8	0.0	98.0
Title.I.CRCT.Science	1,073	72.6	13.2	0.0	98.9
Title.I.CRCT.Social.Studies	1,073	78.5	13.3	0.0	98.9
Non.Title.I.CRCT.Math	1,073	38.3	41.9	0.0	100.0
Non.Title.I.CRCT.Reading	1,073	42.3	45.7	0.0	100.0
Non.Title.I.CRCT.English.Language.Arts	1,073	41.3	44.6	0.0	100.0
Non.Title.I.CRCT.Science	1,073	36.7	40.5	0.0	100.0
Non.Title.I.CRCT.Social.Studies	1,073	38.5	42.6	0.0	100.0
Title.I.GHSGT.Math	1,073	30.4	42.6	0.0	100.0
Title.I.GHSGT.English.Language.Arts	1,073	30.2	42.4	0.0	100.0
Title.I.GHSGT.Science	1,073	25.6	37.1	0.0	100.0
Title.I.GHSGT.Social.Science	1,073	26.6	37.6	0.0	100.0
Non.Title.I.GHSGT.Math	1,073	67.1	41.7	0.0	100.0
Non.Title.I.GHSGT.English.Language.Arts	1,073	67.3	41.7	0.0	100.0
Non.Title.I.GHSGT.Science	1,073	57.3	36.8	0.0	100.0
Non.Title.I.GHSGT.Social.Science	1,073	61.4	38.4	0.0	100.0
GreatRecession	1,073	0.5	0.5	0	1
Median.Income	1,073	39,660.3	10,786.2	23,456	88,626
Unemployment	1,073	7.5	3.2	3.0	22.9
Per.FTE.Total	1,073	8,111.5	1,202.0	5,521.7	15,021.2
Schools	1,073	11.2	18.2	1	138
ClassSize	1,073	14.5	1.3	9.2	25.6
Training.and.Experience..	1,073	49.7	7.0	27.5	88.9
Status.US	1,073	0.2	0.4	0	1
Status.CO	1,073	0.4	0.5	0	1
City	1,073	0.1	0.3	0	1
Town	1,073	0.2	0.4	0	1
Suburb	1,073	0.1	0.3	0	1
WhitePercentage	1,073	54.6	24.7	0.3	99.5
FemalePercentage	1,073	48.7	1.2	42.6	54.1
Economically.Disadvantaged	1,073	59.4	17.5	11	104
Title.I.Percentage	1,073	71.0	23.8	0.0	100.0

Table 1: Descriptive Statistics

Missing Data

School Districts Missing Removal

Tests	Original	Remaining After Removal
Title.I.CRCT.Math	179	179
Title.I.CRCT.Reading	179	179
Title.I.CRCT.English.Language.Arts	179	179
Title.I.CRCT.Science	179	179
Title.I.CRCT.Social.Studies	179	179
Non.Title.I.CRCT.Math	179	58
Non.Title.I.CRCT.Reading	179	59
Non.Title.I.CRCT.English.Language.Arts	179	59
Non.Title.I.CRCT.Science	179	57
Non.Title.I.CRCT.Social.Studies	179	57
Title.I.GHSGT.Math	179	45
Title.I.GHSGT.English.Language.Arts	179	45
Title.I.GHSGT.Science	179	45
Title.I.GHSGT.Social.Science	179	45
Non.Title.I.GHSGT.Math	179	90
Non.Title.I.GHSGT.English.Language.Arts	179	91
Non.Title.I.GHSGT.Science	179	91
Non.Title.I.GHSGT.Social.Science	179	91

Table 2: Missing Data

Section 2: Hypothesis Testing

Hypotheses

Hypothesis 1:
(a)Ho: The average percentage of students from Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(a)Ha: The average percentage of students from Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ho: The average percentage of students from Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ha: The average percentage of students from Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
Hypothesis 2:
(a)Ho: The average percentage of students from Non-Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Non-Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(a)Ha: The average percentage of students from Non-Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals is significantly higher after the Great Recession than the average percentage of students from Non-Title I Elementary or Middle Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ho: The average percentage of students from Non-Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Non-Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ha: The average percentage of students from Non-Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Non-Title I Elementary or Middle Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
Hypothesis 3:
(a)Ho: The average percentage of students from Title I High Schools that passed tests relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Title I High Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(a)Ha: The average percentage of students from Title I High Schools that passed tests relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Title I High Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ho: The average percentage of students from Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ha: The average percentage of students from Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
Hypothesis 4:
(a)Ho: The average percentage of students from Non-Title I High Schools that passed tests relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Non-Title I High Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(a)Ha: The average percentage of students from Non-Title I High Schools that passed tests relevant to meeting adequate yearly progress goals is significantly higher after the Great Recession than the average percentage of students from Non-Title I High Schools that passed tests relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ho: The average percentage of students from Non-Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals is the same after the Great Recession as the average percentage of students from Non-Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession
(b)Ha: The average percentage of students from Non-Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals is significantly lower after the Great Recession than the average percentage of students from Non-Title I High Schools that passed tests not relevant to meeting adequate yearly progress goals before the Great Recession

Table 3: Hypotheses

Normality

TI CRCT Math Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 1.3516	0.001996	***
Anderson-Darling Test (2008-2010)	A = 1.7073	0.000216	***
Shapiro-Wilk Test (2005-2007)	W = 0.9576	3.174e-05	***
Shapiro-Wilk Test (2008-2010)	W = 0.9627	0.0001041	***
Lilliefors Test (2005-2007)	D = 0.0661	0.05478	*
Lilliefors Test (2008-2010)	D = 0.0841	0.00359	**

TI CRCT Reading Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 3.5175	8.02e-09	***
Anderson-Darling Test (2008-2010)	A = 0.9748	0.01388	**
Shapiro-Wilk Test (2005-2007)	W = 0.8961	7.205e-10	***
Shapiro-Wilk Test (2008-2010)	W = 0.9758	0.003313	***
Lilliefors Test (2005-2007)	D = 0.1254	3.064e-07	***
Lilliefors Test (2008-2010)	D = 0.0584	0.1434	

TI CRCT ELA Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 2.2015	1.317e-05	***
Anderson-Darling Test (2008-2010)	A = 1.247	0.002949	***
Shapiro-Wilk Test (2005-2007)	W = 0.9140	9.593e-09	***
Shapiro-Wilk Test (2008-2010)	W = 0.9756	0.003113	***
Lilliefors Test (2005-2007)	D = 0.0900	0.001229	***
Lilliefors Test (2008-2010)	D = 0.0701	0.03179	**

TI CRCT Science Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 1.8791	8.159e-05	***
Anderson-Darling Test (2008-2010)	A = 1.2611	0.002721	***
Shapiro-Wilk Test (2005-2007)	W = 0.9627	0.0001037	***
Shapiro-Wilk Test (2008-2010)	W = 0.9790	0.008416	***
Lilliefors Test (2005-2007)	D = 0.0815	0.005569	***
Lilliefors Test (2008-2010)	D = 0.1014	0.0001209	***

TI CRCT SS Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 5.3833	2.474e-13	***
Anderson-Darling Test (2008-2010)	A = 0.8351	0.03078	**
Shapiro-Wilk Test (2005-2007)	W = 0.8568	6.403e-12	***
Shapiro-Wilk Test (2008-2010)	W = 0.9841	0.04051	**
Lilliefors Test (2005-2007)	D = 0.1435	1.489e-09	***
Lilliefors Test (2008-2010)	D = 0.0738	0.01954	**

NTI CRCT Math Normality Hypothesis Testing	Test Statistic	P.Value
Anderson-Darling Test (2005-2007)	A = 0.3808	0.3908
Anderson-Darling Test (2008-2010)	A = 0.4624	0.2489
Shapiro-Wilk Test (2005-2007)	W = 0.9772	0.3447
Shapiro-Wilk Test (2008-2010)	W = 0.9681	0.1294
Lilliefors Test (2005-2007)	D = 0.0750	0.5765
Lilliefors Test (2008-2010)	D = 0.0938	0.231

NTI CRCT Reading Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.2672	0.6752	
Anderson-Darling Test (2008-2010)	A = 0.8714	0.02392	***
Shapiro-Wilk Test (2005-2007)	W = 0.9831	0.5821	
Shapiro-Wilk Test (2008-2010)	W = 0.928	0.001811	***
Lilliefors Test (2005-2007)	D = 0.0808	0.4411	
Lilliefors Test (2008-2010)	D = 0.1020	0.1322	

NTI CRCT ELA Normality Hypothesis Testing	Test Statistic	P.Value
Anderson-Darling Test (2005-2007)	A = 0.1243	0.9857
Anderson-Darling Test (2008-2010)	A = 0.2100	0.8542
Shapiro-Wilk Test (2005-2007)	W = 0.9926	0.9767
Shapiro-Wilk Test (2008-2010)	W = 0.9819	0.5248
Lilliefors Test (2005-2007)	D = 0.0455	0.9918
Lilliefors Test (2008-2010)	D = 0.0614	0.8398

NTI CRCT Science Normality Hypothesis Testing	Test Statistic	P.Value
Anderson-Darling Test (2005-2007)	A = 0.4598	0.2524
Anderson-Darling Test (2008-2010)	A = 0.4323	0.2943
Shapiro-Wilk Test (2005-2007)	W = 0.9707	0.1807
Shapiro-Wilk Test (2008-2010)	W = 0.9719	0.206
Lilliefors Test (2005-2007)	D = 0.0813	0.4579
Lilliefors Test (2008-2010)	D = 0.0662	0.773

NTI CRCT SS Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.311	0.543	
Anderson-Darling Test (2008-2010)	A = 1.5908	0.0003874	***
Shapiro-Wilk Test (2005-2007)	W = 0.9771	0.3492	
Shapiro-Wilk Test (2008-2010)	W = 0.9137	0.0006118	***
Lilliefors Test (2005-2007)	D = 0.0728	0.6353	
Lilliefors Test (2008-2010)	D = 0.1223	0.03338	**

Notes:
***Significant at the 1 percent level
**Significant at the 5 percent level
*Significant at the 10 percent level

Table 4: CRCT Normality Tests

TI GHSGT Math Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.7909	0.03727	**
Anderson-Darling Test (2008-2010)	A = 0.5923	0.1175	
Shapiro-Wilk Test (2005-2007)	W = 0.9440	0.03027	**
Shapiro-Wilk Test (2008-2010)	W = 0.9620	0.1459	
Lilliefors Test (2005-2007)	D = 0.1540	0.009111	***
Lilliefors Test (2008-2010)	D = 0.1031	0.2685	

TI GHSGT ELA Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.65416	0.08216	*
Anderson-Darling Test (2008-2010)	A = 0.40474	0.3399	
Shapiro-Wilk Test (2005-2007)	W = 0.93288	0.01188	**
Shapiro-Wilk Test (2008-2010)	W = 0.97427	0.4095	
Lilliefors Test (2005-2007)	D = 0.12107	0.09599	*
Lilliefors Test (2008-2010)	D = 0.1012	0.2951	

TI GHSGT Science Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.60974	0.1062	
Anderson-Darling Test (2008-2010)	A = 0.56715	0.1337	
Shapiro-Wilk Test (2005-2007)	W = 0.95303	0.06618	*
Shapiro-Wilk Test (2008-2010)	W = 0.95082	0.05455	*
Lilliefors Test (2005-2007)	D = 0.10209	0.2827	
Lilliefors Test (2008-2010)	D = 0.09780	0.3459	

TI GHSGT SS Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.85013	0.02646	**
Anderson-Darling Test (2008-2010)	A = 0.76785	0.04257	**
Shapiro-Wilk Test (2005-2007)	W = 0.94267	0.02699	**
Shapiro-Wilk Test (2008-2010)	W = 0.94165	0.02473	**
Lilliefors Test (2005-2007)	D = 0.13879	0.02961	**
LilliforsTest (2008-2010)	D = 0.1495	0.01314	**

NTI GHSGT Math Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.24669	0.7485	
Anderson-Darling Test (2008-2010)	A = 1.431	0.001	***
Shapiro-Wilk Test (2005-2007)	W = 0.9898	0.7161	
Shapiro-Wilk Test (2008-2010)	W = 0.89932	3.775e-06	***
Lilliefors Test (2005-2007)	D = 0.059142	0.612	
Lilliefors Test (2008-2010)	D = 0.10172	0.02243	**

NTI GHSGT ELA Normality Hypothesis Testing	Test Statistic	P.Value
Anderson-Darling Test (2005-2007)	A = 0.3454	0.477
Anderson-Darling Test (2008-2010)	A = 0.34495	0.4781
Shapiro-Wilk Test (2005-2007)	W = 0.98876	0.6325
Shapiro-Wilk Test (2008-2010)	W = 0.98894	0.6458
Lilliefors Test (2005-2007)	D = 0.08273	0.1301
Lilliefors Test (2008-2010)	D = 0.07894	0.1754

NTI GHSGT Science Normality Hypothesis Testing	Test Statistic	P.Value
Anderson-Darling Test (2005-2007)	A = 0.39842	0.359
Anderson-Darling Test (2008-2010)	A = 0.19648	0.8869
Shapiro-Wilk Test (2005-2007)	W = 0.98839	0.605
Shapiro-Wilk Test (2008-2010)	W = 0.98888	0.6411
Lilliefors Test (2005-2007)	D = 0.06551	0.437
Lilliefors Test (2008-2010)	D = 0.98888	0.761

NTI GHSGT SS Normality Hypothesis Testing	Test Statistic	P.Value	
Anderson-Darling Test (2005-2007)	A = 0.2821	0.6299	
Anderson-Darling Test (2008-2010)	A = 0.8336	0.03048	**
Shapiro-Wilk Test (2005-2007)	W = 0.9912	0.8063	
Shapiro-Wilk Test (2008-2010)	W = 0.9449	0.000762	***
Lilliefors Test (2005-2007)	D = 0.0639	0.4711	
Lilliefors Test (2008-2010)	D = 0.1058	0.01366	**

Notes:
***Significant at the 1 percent level
**Significant at the 5 percent level
*Significant at the 10 percent level

Table 5: GHSGT Normality Tests

Normality Assumption

Statistic	Before GR Distribution	After GR Distribution
AYP.Percentage	Non-Normal	Non-Normal
Title.I.CRCT.Math	Non-Normal	Non-Normal
Title.I.CRCT.Reading	Non-Normal	Non-Normal
Title.I.CRCT.English.Language.Arts	Non-Normal	Non-Normal
Title.I.CRCT.Science	Non-Normal	Non-Normal
Title.I.CRCT.Social.Studies	Non-Normal	Non-Normal
Non.Title.I.CRCT.Math	Normal	Normal
Non.Title.I.CRCT.Reading	Normal	Non-Normal
Non.Title.I.CRCT.English.Language.Arts	Normal	Normal
Non.Title.I.CRCT.Science	Normal	Normal
Non.Title.I.CRCT.Social.Studies	Normal	Non-Normal
Title.I.GHSGT.Math	Non-Normal	Normal
Title.I.GHSGT.English.Language.Arts	Non-Normal	Normal
Title.I.GHSGT.Science	Non-Normal	Non-Normal
Title.I.GHSGT.Social.Science	Non-Normal	Non-Normal
Non.Title.I.GHSGT.Math	Normal	Non-Normal
Non.Title.I.GHSGT.English.Language.Arts	Normal	Normal
Non.Title.I.GHSGT.Science	Normal	Normal
Non.Title.I.GHSGT.Social.Science	Normal	Non-Normal

Table 6: Normality Classification

Results

Hypothesis Testing (Before and After Great Recession)	Test Statistic	DF	P.Value	
Hypothesis 1				
Meeting AYP Percentage:				
Dependent T-Test:	NA	NA	NA	
Wilcoxon-Mann-Whitney Test:	V = 5844	NA	0.7348	
Hypothesis 2(a)				
TI CRCT Math:				
Dependent T-Test:	t = 2.8973	165	0.002118	***
Wilcoxon-Mann-Whitney Test:	V = 10722	NA	3.114e-05	***
TI CRCT Reading:				
Dependent T-Test:	t = -17.884	178	1	
Wilcoxon-Mann-Whitney Test:	V = 0	NA	1	
TI CRCT English-Language Arts:				
Dependent T-Test:	NA	NA	NA	
Wilcoxon-Mann-Whitney Test:	V = 75	NA	1	
Hypothesis 2(b)				
TI CRCT Science:				
Dependent T-Test:	NA	NA	NA	
Wilcoxon-Mann-Whitney Test:	V = 15074	NA	< 2.2e-16	***
TI CRCT Social Studies:				
Dependent T-Test:	NA	NA	NA	
Wilcoxon-Mann-Whitney Test:	V = 15583	NA	< 2.2e-16	***
Hypothesis 3(a)				
NTI CRCT Math:				
Dependent T-Test:	t = 2.7744	89	0.9966	
Wilcoxon-Mann-Whitney Test:	V = 1417.5	NA	0.8959	
NTI CRCT Reading:				
Dependent T-Test:	t = -14.116	58	< 2.2e-16	***
Wilcoxon-Mann-Whitney Test:	V = 2.5	NA	1.392e-11	***
NTI CRCT English-Language Arts:				
Dependent T-Test:	t = -11.007	58	3.93e-16	***
Wilcoxon-Mann-Whitney Test:	V = 45.5	NA	1.204e-10	***
Hypothesis 3(b)				
NTI CRCT Science:				
Dependent T-Test:	t = 3.872	56	0.0001423	***
Wilcoxon-Mann-Whitney Test:	V = 1318	NA	4.685e-05	***
NTI CRCT Social Studies:				
Dependent T-Test:	t = 11.85	56	< 2.2e-16	***
Wilcoxon-Mann-Whitney Test:	V = 1653	NA	2.64e-11	***
Hypothesis 4(a)				
TI GHSGT Math:				
Dependent T-Test:	t = -4.5869	44	1	
Wilcoxon-Mann-Whitney Test:	V = 172	NA	1	
TI GHSGT English-Language Arts:				
Dependent T-Test:	t = 11.029	44	1.494e-14	***
Wilcoxon-Mann-Whitney Test:	V = 1034	NA	5.684e-14	***
Hypothesis 4(b)				
TI GHSGT Science:				
Dependent T-Test:	t = -19.851	44	1	
Wilcoxon-Mann-Whitney Test:	V = 0	NA	1	
TI GHSGT Social Science:				
Dependent T-Test:	NA	NA	NA	
Wilcoxon-Mann-Whitney Test:	V = 395	NA	0.9167	
Hypothesis 5(a)				
NTI GHSGT Math:				
Dependent T-Test:	t = -4.2832	89	2.322e-05	***
Wilcoxon-Mann-Whitney Test:	V = 809.5	NA	8.903e-07	***
NTI GHSGT English-Language Arts:				
Dependent T-Test:	t = 16.174	90	1	
Wilcoxon-Mann-Whitney Test:	V = 4053.5	NA	1	
Hypothesis 5(b)				
NTI GHSGT Science:				
Dependent T-Test:	t = -30.08	90	1	
Wilcoxon-Mann-Whitney Test:	V = 0	NA	1	
NTI GHSGT Social Science:				
Dependent T-Test:	t = 0.15337	90	0.4392	
Wilcoxon-Mann-Whitney Test:	V = 2218	NA	0.3111	

Notes:
*** Significant at the 1 percent level.
** Significant at the 5 percent level.
* Significant at the 10 percent level.

Table 7: Hypothesis Test Results

Section 3: Empirical Model Results

Model 1: Simple OLS

	Title.I.CRCT.Math	Title.I.CRCT.Reading	Title.I.CRCT.English.Language.Arts	Title.I.CRCT.Science	Title.I.CRCT.Social.Studies
	(1)	(2)	(3)	(4)	(5)
Constant	79.862***	85.025***	82.214***	74.882***	85.168***
	(0.367)	(0.270)	(0.276)	(0.561)	(0.496)
GreatRecession	-0.990*	5.587***	4.571***	-4.470***	-13.359***
	(0.518)	(0.381)	(0.390)	(0.793)	(0.701)
N	1,073	1,073	1,073	1,073	1,073
R^2	0.003	0.167	0.114	0.029	0.253
Adjusted R^2	0.002	0.166	0.113	0.028	0.252
Residual Std. Error (df = 1071)	8.491	6.245	6.387	12.990	11.483
F Statistic (df = 1; 1071)	3.643*	214.740***	137.369***	31.762***	363.050***

Notes:

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

Table 8: Simple OLS (Model 1)

Model 2: OLS with Controls

	Title I CRCT Math	Title I CRCT Reading	Title I CRCT English Language Arts	Title I CRCT Science	Title I CRCT Social Studies
	(1)	(2)	(3)	(4)	(5)
Constant	130.043***	111.447***	107.431***	124.839***	189.116***
	(18.317)	(14.860)	(15.624)	(26.124)	(26.056)
GreatRecession	-3.555***	5.277***	3.602***	-7.369***	-4.108***
	(0.604)	(0.490)	(0.515)	(0.861)	(0.859)
Median.Income	0.00005	0.0001*	0.0001**	-0.0002***	-0.0001
	(0.0001)	(0.00004)	(0.00005)	(0.0001)	(0.0001)
Unemployment	0.385	0.357*	0.303	-0.279	-1.840***
	(0.259)	(0.210)	(0.221)	(0.369)	(0.368)
Per.FTE.Total	-0.001***	-0.001***	-0.0005**	-0.003***	-0.001***
	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Schools	0.045	0.108	-0.0003	-0.493*	-0.735***
	(0.176)	(0.143)	(0.150)	(0.252)	(0.251)
ClassSize	0.711	1.338***	1.313***	-1.207	-1.914**
	(0.526)	(0.426)	(0.448)	(0.750)	(0.748)
Training.and.Experience..	0.164***	0.090***	0.153***	0.045	0.039
	(0.033)	(0.027)	(0.028)	(0.047)	(0.047)
Status.US	0.846	0.387	0.941*	-0.136	-0.126
	(0.569)	(0.461)	(0.485)	(0.811)	(0.809)
Status.CO	-0.497	-0.039	0.218	0.253	-0.680
	(0.497)	(0.403)	(0.424)	(0.709)	(0.707)
City	6.193***	0.318	0.039	7.598***	3.118
	(1.476)	(1.197)	(1.259)	(2.105)	(2.099)
Town	-0.335	-0.551	-0.635	-2.134*	-1.621
	(0.845)	(0.686)	(0.721)	(1.205)	(1.202)
Suburb	1.055	-0.352	-0.823	0.456	0.821
	(1.211)	(0.982)	(1.033)	(1.727)	(1.722)
WhitePercentage	-1.240***	-0.922***	-1.214***	-0.378	-1.398***
	(0.282)	(0.228)	(0.240)	(0.402)	(0.401)
FemalePercentage	-1.050***	-0.761***	-0.825***	0.199	-0.854*
	(0.323)	(0.262)	(0.275)	(0.461)	(0.459)
Economically.Disadvantaged	-0.153	-0.098	-0.128	-0.328**	-0.854***
	(0.110)	(0.089)	(0.094)	(0.157)	(0.157)
Title.I.Percentage	0.033***	0.055***	0.067***	0.005	0.034**
	(0.012)	(0.010)	(0.010)	(0.017)	(0.017)
Median.Income:Unemployment	0.00000	-0.00001	-0.00000	0.00003***	0.00000
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Schools:ClassSize	-0.012	-0.017*	-0.011	0.016	0.040**
	(0.011)	(0.009)	(0.010)	(0.016)	(0.016)
Schools:City	-0.225***	-0.020	0.006	-0.186**	-0.127
	(0.058)	(0.047)	(0.050)	(0.083)	(0.083)
Schools:Town	0.135	0.043	0.032	0.264	0.167
	(0.113)	(0.091)	(0.096)	(0.161)	(0.160)
Schools:Suburb	0.031	0.060*	0.083**	0.130**	0.048
	(0.042)	(0.034)	(0.036)	(0.061)	(0.060)
Schools:Title.I.Percentage	0.0004	0.001	0.0004	0.001	-0.0001
	(0.001)	(0.0004)	(0.0005)	(0.001)	(0.001)
ClassSize:Economically.Disadvantaged	-0.010	-0.013**	-0.010	-0.007	0.035***
	(0.008)	(0.006)	(0.007)	(0.011)	(0.011)
WhitePercentage:Economically.Disadvantaged	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.001)	(0.0004)	(0.0005)	(0.001)	(0.001)
WhitePercentage:FemalePercentage	0.025***	0.017***	0.023***	0.009	0.027***
	(0.006)	(0.005)	(0.005)	(0.008)	(0.008)
N	1,073	1,073	1,073	1,073	1,073
R^2	0.515	0.507	0.445	0.589	0.598
Adjusted R^2	0.503	0.495	0.432	0.579	0.588
Residual Std. Error (df = 1047)	5.991	4.860	5.110	8.545	8.522
F Statistic (df = 25; 1047)	44.455***	43.025***	33.635***	60.060***	62.257***

Notes:

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

Table 9: OLS with Controls (Model 2)

Model 3: Math Quantile Regression

	Title.I.CRCT.Math				
	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile
	(1)	(2)	(3)	(4)	(5)
Constant	197.264***	159.491***	176.097***	140.075***	96.617***
	(31.510)	(18.154)	(16.559)	(22.821)	(29.161)
GreatRecession	-3.010***	-4.433***	-4.368***	-3.991***	-3.134***
	(0.669)	(0.512)	(0.435)	(0.565)	(0.740)
Per.FTE.Total	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.0004)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Economically.Disadvantaged	-0.534***	-0.363***	-0.467***	-0.217**	-0.111
	(0.180)	(0.065)	(0.084)	(0.103)	(0.141)
Schools	0.089	-0.051	-0.129	-0.284	-0.191
	(0.416)	(0.089)	(0.090)	(0.220)	(0.350)
Training.and.Experience..	0.270***	0.251***	0.213***	0.221***	0.227***
	(0.040)	(0.025)	(0.023)	(0.030)	(0.023)
Median.Income	-0.00002	0.0001***	0.00004	-0.00004	-0.00002
	(0.0001)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Unemployment	0.438	0.648***	0.458***	0.024	-0.027
	(0.416)	(0.136)	(0.145)	(0.173)	(0.176)
WhitePercentage	-2.153***	-1.623***	-1.479***	-0.992***	-0.233
	(0.437)	(0.280)	(0.242)	(0.308)	(0.387)
FemalePercentage	-2.160***	-1.557***	-1.510***	-0.841*	0.115
	(0.486)	(0.349)	(0.302)	(0.442)	(0.546)
ClassSize	0.065	-0.235	-1.062***	-0.427	-0.458
	(1.039)	(0.231)	(0.373)	(0.407)	(0.627)
Status.US	0.957	0.199	0.834*	0.931**	-0.125
	(0.640)	(0.519)	(0.466)	(0.454)	(0.374)
Status.CO	-0.186	-0.852**	-0.279	-1.373***	-0.491
	(0.661)	(0.371)	(0.328)	(0.450)	(0.344)
City	7.416***	8.222***	7.405***	5.699***	2.992**
	(2.773)	(1.379)	(1.222)	(1.084)	(1.241)
Town	-0.458	0.810	-0.797	-1.245	-2.568***
	(1.089)	(0.827)	(0.618)	(0.775)	(0.733)
Suburb	1.186	1.253*	0.350	-0.344	-1.309
	(1.658)	(0.755)	(0.746)	(0.788)	(0.932)
Title.I.Percentage	0.055***	-0.005	-0.016	-0.020*	-0.022**
	(0.021)	(0.011)	(0.010)	(0.011)	(0.010)
Economically.Disadvantaged:WhitePercentage	0.001	0.001***	0.001*	0.001**	0.001
	(0.001)	(0.0004)	(0.0004)	(0.0005)	(0.0005)
Economically.Disadvantaged:ClassSize	0.007	0.006	0.015***	-0.001	-0.004
	(0.015)	(0.005)	(0.006)	(0.007)	(0.010)
Schools:ClassSize	-0.016	-0.007	-0.005	0.008	-0.001
	(0.025)	(0.006)	(0.005)	(0.014)	(0.022)
Schools:Title.I.Percentage	0.001	0.002***	0.001***	0.0002	-0.0004
	(0.001)	(0.0003)	(0.0003)	(0.0005)	(0.0004)
Median.Income:Unemployment	0.00000	0.00000	0.00000	0.00001***	0.00001**
	(0.00001)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Schools:City	-0.216*	-0.279***	-0.232***	-0.200***	-0.104**
	(0.125)	(0.036)	(0.040)	(0.041)	(0.047)
Schools:Town	0.200	0.061	0.158**	0.194	0.309***
	(0.127)	(0.099)	(0.069)	(0.137)	(0.104)
Schools:Suburb	0.031	0.001	0.057**	0.074***	0.157***
	(0.106)	(0.021)	(0.023)	(0.026)	(0.027)
WhitePercentage:FemalePercentage	0.043***	0.034***	0.031***	0.020***	0.005
	(0.009)	(0.006)	(0.005)	(0.006)	(0.008)
N	1,073	1,073	1,073	1,073	1,073

Notes:

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

Table 10: Math Quantile Regression (Model 3)

Model 3: Reading Quantile Regression

	Title.1.CRCT.Reading				
	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile
	(1)	(2)	(3)	(4)	(5)
Constant	115.003***	118.652***	116.295***	142.707***	117.251***
	(25.089)	(20.271)	(10.361)	(11.935)	(12.795)
GreatRecession	6.667***	5.543***	3.953***	3.469***	3.120***
	(0.495)	(0.380)	(0.282)	(0.258)	(0.232)
Per.FTE.Total	-0.001***	-0.001***	-0.0004***	-0.001***	-0.001***
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Economically.Disadvantaged	-0.130	-0.066	-0.111**	-0.163***	0.002
	(0.155)	(0.119)	(0.056)	(0.063)	(0.072)
Schools	-0.011	-0.045	0.029	-0.021	-0.003
	(0.176)	(0.089)	(0.066)	(0.064)	(0.053)
Training.and.Experience..	0.172***	0.166***	0.132***	0.121***	0.151***
	(0.028)	(0.024)	(0.015)	(0.015)	(0.017)
Median.Income	0.00003	0.00004	0.00003	0.00002	-0.00002
	(0.00004)	(0.00004)	(0.00002)	(0.00002)	(0.00003)
Unemployment	-0.120	0.027	0.202**	0.122	-0.080
	(0.223)	(0.208)	(0.088)	(0.102)	(0.123)
WhitePercentage	-1.167***	-1.037***	-0.834***	-0.883***	-0.551***
	(0.374)	(0.282)	(0.155)	(0.196)	(0.177)
FemalePercentage	-0.794*	-0.890**	-0.740***	-1.022***	-0.603***
	(0.470)	(0.373)	(0.193)	(0.251)	(0.224)
ClassSize	1.399**	1.092**	0.662***	-0.064	0.269
	(0.620)	(0.530)	(0.247)	(0.244)	(0.351)
Status.US	0.032	0.257	0.711***	0.533*	0.599***
	(0.473)	(0.324)	(0.228)	(0.294)	(0.222)
Status.CO	-0.739*	-0.616*	0.200	0.197	0.108
	(0.396)	(0.348)	(0.239)	(0.210)	(0.279)
City	-1.471	1.429	2.303***	2.510***	2.489***
	(1.128)	(1.484)	(0.825)	(0.646)	(0.661)
Town	-0.771	-1.004**	-0.454	-0.484	-0.099
	(0.738)	(0.511)	(0.533)	(0.554)	(0.403)
Suburb	-1.098	-1.076	-0.502	0.237	0.179
	(1.028)	(0.966)	(0.492)	(0.648)	(0.710)
Title.1.Percentage	0.049***	0.030***	0.010*	-0.008	-0.024***
	(0.012)	(0.009)	(0.006)	(0.006)	(0.006)
Economically.Disadvantaged:WhitePercentage	0.003***	0.002***	0.001***	0.001*	0.0002
	(0.0005)	(0.001)	(0.0003)	(0.0003)	(0.0003)
Economically.Disadvantaged:ClassSize	-0.014	-0.013	-0.006	0.002	-0.006
	(0.010)	(0.009)	(0.004)	(0.004)	(0.005)
Schools:ClassSize	-0.018	-0.009	-0.011***	-0.007	-0.009***
	(0.011)	(0.005)	(0.004)	(0.004)	(0.003)
Schools:Title.1.Percentage	0.002***	0.001***	0.001***	0.001**	0.001***
	(0.001)	(0.0003)	(0.0002)	(0.0002)	(0.0001)
Median.Income:Unemployment	0.00000	0.00000	-0.00000	0.00000	0.00000
	(0.00001)	(0.00001)	(0.00000)	(0.00000)	(0.00000)
Schools:City	0.087	-0.035	-0.086***	-0.075***	-0.068*
	(0.068)	(0.043)	(0.029)	(0.026)	(0.036)
Schools:Town	0.089	0.051	0.036	0.074	0.042
	(0.102)	(0.046)	(0.068)	(0.075)	(0.052)
Schools:Suburb	0.145**	0.082***	0.048**	0.041**	0.056**
	(0.066)	(0.029)	(0.020)	(0.020)	(0.022)
WhitePercentage:FemalePercentage	0.021***	0.020***	0.017***	0.018***	0.012***
	(0.008)	(0.006)	(0.003)	(0.004)	(0.004)
N	1,073	1,073	1,073	1,073	1,073

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 11: Reading Quantile Regression (Model 3)

Model 3: English-Language Arts Quantile Regression

	Title.I.CRCT.English.Language.Arts				
	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile
	(1)	(2)	(3)	(4)	(5)
Constant	111.865***	112.472***	110.976***	112.603***	100.708***
	(26.735)	(17.830)	(15.866)	(16.711)	(16.977)
GreatRecession	4.331***	3.633***	2.501***	2.038***	2.196***
	(0.465)	(0.430)	(0.393)	(0.371)	(0.425)
Per.FTE..Total	-0.001***	-0.001***	-0.0005**	-0.001***	-0.001***
	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0002)
Economically.Disadvantaged	-0.240**	-0.126	-0.154*	-0.235***	-0.057
	(0.106)	(0.110)	(0.088)	(0.074)	(0.093)
Schools	-0.131	-0.196***	-0.092	-0.095	-0.417
	(0.127)	(0.073)	(0.109)	(0.077)	(0.299)
Training.and.Experience..	0.192***	0.205***	0.193***	0.205***	0.204***
	(0.024)	(0.025)	(0.025)	(0.017)	(0.019)
Median.Income	0.0002***	0.0001***	0.0001*	-0.00000	-0.00002
	(0.00004)	(0.00004)	(0.00003)	(0.00003)	(0.00004)
Unemployment	0.511*	0.301*	0.247	-0.022	-0.216
	(0.274)	(0.168)	(0.178)	(0.134)	(0.164)
WhitePercentage	-1.383***	-1.285***	-1.008***	-0.799***	-0.513**
	(0.434)	(0.274)	(0.244)	(0.236)	(0.232)
FemalePercentage	-0.836*	-0.919***	-0.697**	-0.495	-0.274
	(0.495)	(0.332)	(0.278)	(0.306)	(0.285)
ClassSize	1.051***	0.880*	0.601	-0.048	-0.069
	(0.362)	(0.477)	(0.397)	(0.321)	(0.474)
Status.US	1.057**	0.541	1.112***	1.074***	0.544*
	(0.509)	(0.419)	(0.383)	(0.285)	(0.329)
Status.CO	-0.066	-0.041	0.220	0.342	0.273
	(0.502)	(0.371)	(0.352)	(0.301)	(0.306)
City	-0.274	0.123	1.902*	1.846**	1.810*
	(1.481)	(1.500)	(1.078)	(0.839)	(1.040)
Town	-0.977	-0.924*	-0.522	-0.964*	-1.477***
	(0.732)	(0.552)	(0.667)	(0.577)	(0.476)
Suburb	-2.165***	-1.204	-0.988	-0.007	-1.261
	(0.741)	(0.906)	(0.672)	(0.733)	(0.847)
Title.I.Percentage	0.071***	0.039***	0.016*	0.015**	-0.004
	(0.011)	(0.010)	(0.009)	(0.007)	(0.009)
Economically.Disadvantaged:WhitePercentage	0.001***	0.001***	0.001***	0.001*	-0.0003
	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Economically.Disadvantaged:ClassSize	-0.006	-0.007	-0.005	0.004	-0.002
	(0.007)	(0.007)	(0.006)	(0.005)	(0.007)
Schools:ClassSize	-0.008	-0.0002	-0.007	-0.003	0.015
	(0.007)	(0.005)	(0.007)	(0.004)	(0.020)
Schools:Title.I.Percentage	0.001	0.001***	0.001***	0.0001	0.0003
	(0.001)	(0.0002)	(0.0003)	(0.0003)	(0.001)
Median.Income:Unemployment	-0.00000	-0.00000	0.00000	0.00001**	0.00001***
	(0.00001)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Schools:City	0.075*	0.024	-0.059	-0.048	-0.009
	(0.045)	(0.037)	(0.038)	(0.029)	(0.035)
Schools:Town	0.109	0.045	-0.009	0.108	0.205***
	(0.067)	(0.055)	(0.085)	(0.114)	(0.049)
Schools:Suburb	0.151***	0.103***	0.086***	0.071***	0.134***
	(0.031)	(0.024)	(0.029)	(0.023)	(0.030)
WhitePercentage:FemalePercentage	0.026***	0.025***	0.020***	0.016***	0.011**
	(0.009)	(0.006)	(0.005)	(0.005)	(0.005)
N	1,073	1,073	1,073	1,073	1,073

Notes:

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

Table 12: English-Language Arts Quantile Regression (Model 3)

Model 3: Science Quantile Regression

	Title.I.CRCT.Science				
	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile
	(1)	(2)	(3)	(4)	(5)
Constant	75.480*	119.959***	142.133***	156.758***	196.871***
	(40.655)	(20.858)	(35.223)	(20.628)	(37.427)
GreatRecession	-2.671***	-5.670***	-8.599***	-10.801***	-10.235***
	(0.887)	(0.654)	(0.730)	(0.757)	(0.981)
Per.FTE.Total	-0.003***	-0.003***	-0.003***	-0.002***	-0.002***
	(0.001)	(0.0002)	(0.0004)	(0.0003)	(0.0004)
Economically.Disadvantaged	-0.185	-0.224	-0.680***	-0.532***	-0.656***
	(0.284)	(0.160)	(0.155)	(0.117)	(0.218)
Schools	-0.103	-0.491**	-0.977***	-0.842***	-0.790***
	(0.219)	(0.197)	(0.191)	(0.210)	(0.286)
Training.and.Experience..	0.118**	0.147***	0.178***	0.106***	0.166***
	(0.055)	(0.036)	(0.044)	(0.034)	(0.051)
Median.Income	-0.0002**	-0.0003***	-0.0002***	-0.0002***	-0.0002***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Unemployment	-0.374	-0.629*	-0.123	-0.313	-0.702*
	(0.488)	(0.327)	(0.366)	(0.211)	(0.403)
WhitePercentage	-0.173	-0.277	-0.199	-0.731***	-1.116**
	(0.498)	(0.275)	(0.477)	(0.262)	(0.504)
FemalePercentage	0.467	0.196	0.506	-0.204	-0.803
	(0.597)	(0.368)	(0.676)	(0.369)	(0.637)
ClassSize	0.563	-1.009	-3.462***	-2.472***	-3.508***
	(1.471)	(0.799)	(0.542)	(0.634)	(1.005)
Status.US	-0.339	0.584	-0.208	-0.248	0.271
	(0.845)	(0.769)	(0.777)	(0.672)	(0.907)
Status.CO	0.050	-0.031	-0.407	-0.024	-0.441
	(0.611)	(0.619)	(0.738)	(0.624)	(0.661)
City	9.078***	12.056***	7.938***	6.717***	5.842***
	(2.697)	(1.919)	(1.514)	(1.458)	(1.619)
Town	-4.556***	-2.815***	-2.162	-1.904*	-0.265
	(1.175)	(1.084)	(1.359)	(1.086)	(1.373)
Suburb	-1.816	-0.039	0.163	-1.098	-1.123
	(2.001)	(1.784)	(1.202)	(1.411)	(1.739)
Title.I.Percentage	0.047**	-0.016	-0.027	-0.046***	-0.032*
	(0.023)	(0.018)	(0.018)	(0.014)	(0.020)
Economically.Disadvantaged:WhitePercentage	0.002*	0.002***	0.001	0.002**	0.00001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Economically.Disadvantaged:ClassSize	-0.021	-0.015	0.018*	0.013	0.032**
	(0.021)	(0.011)	(0.011)	(0.009)	(0.016)
Schools:ClassSize	-0.019	0.013	0.044***	0.039***	0.044**
	(0.014)	(0.013)	(0.013)	(0.012)	(0.019)
Schools:Title.I.Percentage	0.003***	0.002***	0.002***	0.001	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Median.Income:Unemployment	0.00003**	0.00003***	0.00003***	0.00003***	0.00004***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Schools:City	-0.192**	-0.294***	-0.194**	-0.161*	-0.135*
	(0.085)	(0.065)	(0.077)	(0.084)	(0.073)
Schools:Town	0.587***	0.377***	0.325**	0.271*	0.086
	(0.148)	(0.133)	(0.145)	(0.150)	(0.175)
Schools:Suburb	0.181***	0.132**	0.157**	0.149***	0.127**
	(0.054)	(0.059)	(0.071)	(0.047)	(0.061)
WhitePercentage:FemalePercentage	0.005	0.007	0.006	0.017***	0.026**
	(0.010)	(0.006)	(0.010)	(0.005)	(0.010)
N	1,073	1,073	1,073	1,073	1,073

Notes:

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

Table 13: Science Quantile Regression (Model 3)

Model 3: Social Studies Quantile Regression

	Title.1.CRCT.Social.Studies				
	10% Quantile	25% Quantile	50% Quantile	75% Quantile	90% Quantile
	(1)	(2)	(3)	(4)	(5)
Constant	128.450***	215.782***	207.991***	210.406***	194.375***
	(31.074)	(20.470)	(24.238)	(24.064)	(27.003)
GreatRecession	-11.120***	-7.336***	-4.913***	-3.124***	-1.842**
	(0.837)	(0.966)	(0.800)	(0.721)	(0.745)
Per.FTE.Total	-0.002***	-0.001***	-0.001***	-0.001***	-0.0005*
	(0.0004)	(0.0003)	(0.0002)	(0.0002)	(0.0003)
Economically.Disadvantaged	-0.780***	-0.971***	-0.808***	-0.833***	-0.616***
	(0.219)	(0.141)	(0.113)	(0.132)	(0.143)
Schools	-0.793***	-0.848***	-1.078***	-0.782***	-0.791***
	(0.212)	(0.103)	(0.179)	(0.261)	(0.106)
Training.and.Experience..	0.185***	0.081***	0.117***	0.175***	0.139***
	(0.056)	(0.030)	(0.027)	(0.028)	(0.031)
Median.Income	-0.0002**	-0.0001*	-0.0001***	-0.0002***	-0.0001**
	(0.0001)	(0.0001)	(0.00004)	(0.00004)	(0.00005)
Unemployment	-2.745***	-2.109***	-2.007***	-2.092***	-1.634***
	(0.503)	(0.394)	(0.318)	(0.302)	(0.353)
WhitePercentage	-0.634	-1.695***	-1.373***	-1.180***	-1.394***
	(0.397)	(0.346)	(0.322)	(0.316)	(0.365)
FemalePercentage	0.298	-1.187***	-1.076**	-1.086**	-1.057**
	(0.489)	(0.386)	(0.429)	(0.463)	(0.489)
ClassSize	-0.949	-2.814***	-2.603***	-3.190***	-2.604***
	(1.363)	(0.528)	(0.473)	(0.522)	(0.559)
Status.US	-0.918	-0.100	0.429	1.296**	1.187**
	(0.924)	(0.651)	(0.584)	(0.546)	(0.566)
Status.CO	-1.430*	-0.711	-0.560	0.337	0.503
	(0.751)	(0.559)	(0.403)	(0.393)	(0.422)
City	1.891	3.606***	3.772**	3.590***	3.066***
	(1.781)	(1.188)	(1.509)	(0.821)	(1.127)
Town	-2.101	-1.749	-1.798**	-0.028	-0.510
	(1.307)	(1.145)	(0.833)	(1.120)	(0.963)
Suburb	0.103	0.894	0.455	0.560	-0.937
	(1.964)	(1.233)	(0.822)	(0.768)	(0.683)
Title.1.Percentage	0.068***	-0.011	-0.022**	-0.043***	-0.063***
	(0.023)	(0.014)	(0.011)	(0.009)	(0.012)
Economically.Disadvantaged:WhitePercentage	0.004**	0.001**	0.001**	0.0001	0.0001
	(0.001)	(0.001)	(0.001)	(0.0005)	(0.0005)
Economically.Disadvantaged:ClassSize	0.018	0.045***	0.036***	0.046***	0.036***
	(0.019)	(0.009)	(0.008)	(0.009)	(0.010)
Schools:ClassSize	0.035***	0.043***	0.060***	0.046***	0.045***
	(0.013)	(0.006)	(0.011)	(0.017)	(0.006)
Schools:Title.1.Percentage	0.001	0.001***	0.0004	-0.0004	-0.0004
	(0.001)	(0.0003)	(0.0005)	(0.0003)	(0.0004)
Median.Income:Unemployment	0.00003***	0.00001	0.00001	0.00001*	0.00001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Schools:City	-0.057	-0.157**	-0.153**	-0.103**	-0.113***
	(0.102)	(0.064)	(0.076)	(0.047)	(0.033)
Schools:Town	0.378**	0.304***	0.186*	0.047	0.138
	(0.159)	(0.115)	(0.101)	(0.142)	(0.096)
Schools:Suburb	0.134	0.056	0.058	0.042	0.055**
	(0.094)	(0.054)	(0.036)	(0.029)	(0.026)
WhitePercentage:FemalePercentage	0.009	0.034***	0.028***	0.025***	0.030***
	(0.009)	(0.007)	(0.006)	(0.007)	(0.008)
N	1,073	1,073	1,073	1,073	1,073

Notes:

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

Table 14: Social Studies Quantile Regression (Model 3)

Model 4: FE Simple OLS

	Title.I.CRCT.Math	Title.I.CRCT.Reading	Title.I.CRCT.English.Language.Arts	Title.I.CRCT.Science	Title.I.CRCT.Social.Studies
	(1)	(2)	(3)	(4)	(5)
GreatRecession	-0.987***	5.585***	4.570***	-4.479***	-13.357***
	(0.291)	(0.266)	(0.259)	(0.501)	(0.532)
N	1,073	1,073	1,073	1,073	1,073
R^2	0.013	0.330	0.258	0.082	0.414
Adjusted R^2	-0.185	0.196	0.109	-0.102	0.296
F Statistic (df = 1; 893)	11.537***	440.655***	310.695***	80.096***	630.616***

Notes:

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

Table 15: Simple Fixed Effects OLS (Model 4)

Model 5: FE OLS with Controls

	Title.I.CRCT.Math	Title.I.CRCT.Reading	Title.I.CRCT.English.Language.Arts	Title.I.CRCT.Science	Title.I.CRCT.Social.Studies
	(1)	(2)	(3)	(4)	(5)
GreatRecession	-4.391***	5.298***	3.020***	-3.254***	-0.932
	(0.567)	(0.536)	(0.513)	(0.886)	(0.943)
Median.Income	-0.00001	0.00005	0.0001	-0.001***	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Unemployment	0.257	0.241	0.201	-0.393	-2.605***
	(0.238)	(0.225)	(0.215)	(0.371)	(0.395)
Per.FTE.Total	-0.001*	-0.0001	0.0003	-0.005***	-0.001
	(0.0003)	(0.0003)	(0.0003)	(0.001)	(0.001)
Schools	0.103	0.551*	0.351	0.195	-0.764
	(0.311)	(0.294)	(0.281)	(0.486)	(0.517)
ClassSize	1.379**	2.655***	2.036***	-1.461	-2.896**
	(0.677)	(0.640)	(0.612)	(1.058)	(1.126)
Training.and.Experience..	0.018	-0.104**	-0.005	-0.292***	-0.205**
	(0.052)	(0.049)	(0.047)	(0.082)	(0.087)
Status.US	0.102	0.404	0.533	-4.081***	-1.413
	(0.689)	(0.652)	(0.623)	(1.077)	(1.147)
WhitePercentage	1.988***	1.376***	1.341***	2.930***	0.898
	(0.484)	(0.458)	(0.438)	(0.757)	(0.805)
FemalePercentage	2.634***	1.737***	1.868***	2.847***	1.278
	(0.482)	(0.456)	(0.436)	(0.754)	(0.802)
Economically.Disadvantaged	0.017	0.213	0.045	-0.140	-1.448***
	(0.165)	(0.156)	(0.149)	(0.258)	(0.274)
Title.I.Percentage	0.102***	0.148***	0.149***	0.110***	0.175***
	(0.018)	(0.017)	(0.016)	(0.028)	(0.029)
Median.Income:Unemployment	0.00001*	-0.00000	0.00000	0.00002**	0.00001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Schools:ClassSize	-0.006	-0.026**	-0.016	0.003	0.045**
	(0.012)	(0.011)	(0.011)	(0.019)	(0.020)
Schools:City	-0.082	0.280	0.184	-0.011	-0.031
	(0.326)	(0.309)	(0.295)	(0.510)	(0.543)
Schools:Town	-0.819	0.003	0.044	1.228	1.377
	(0.955)	(0.903)	(0.864)	(1.493)	(1.589)
Schools:Suburb	0.048	-0.052	0.096	-0.198	0.275
	(0.299)	(0.282)	(0.270)	(0.467)	(0.497)
Schools:Title.I.Percentage	0.0003	-0.001	-0.001	-0.003	-0.005**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
ClassSize:Economically.Disadvantaged	-0.026***	-0.033***	-0.022**	-0.005	0.051***
	(0.010)	(0.009)	(0.009)	(0.015)	(0.016)
WhitePercentage:Economically.Disadvantaged	0.006***	0.002*	0.003***	0.002	0.011***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
WhitePercentage:FemalePercentage	-0.041***	-0.031***	-0.031***	-0.046***	-0.030*
	(0.010)	(0.009)	(0.009)	(0.015)	(0.016)
N	1,073	1,073	1,073	1,073	1,073
R^2	0.209	0.427	0.388	0.394	0.611
Adjusted R^2	0.028	0.296	0.249	0.255	0.523
F Statistic (df = 21; 873)	10.961***	30.977***	26.369***	26.973***	65.394***

Notes:

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

Table 16: Fixed Effects OLS with Controls (Model 5)

Section 4: Miscellaneous Tables

Title I Percentage

2008-2009 School Type	N	Title I	Title I %	Title I Met AYP %	Non-Title I Met AYP %
Elementary / Middle	1790	1179	65.9%	88.5%	93.7%
High	363	82	25.6%	35.8%	64.4%

Table 17: Title I Percentage

Section 5: Miscellaneous Figures

Georgia AYP

CRCT Point Scale:
Level 1- Below 800: “Does not Meet Standard”
Level 2- 800-849: “Meets Standard” (Proficient student achievement)
Level 3- 850-950: “Exceeds Standard”
GHSGT English/Language Arts and Sciences Point Scale:
Level 1- Below 200: “Below Proficiency”
Level 2- 200-234: “Basic Proficiency” (Proficient Student Achievement)
Level 3- 235-274: “Advanced Proficiency”
Level 4- Above 275: “Honors”
GHSGT Mathematics Point Scale:
Level 1- Below 516: “Basic”
Level 2- 516-524: “Proficient”
Level 3- Above 525: “Advanced”

Figure 1: CRCT / GHSGT Point Scales

Subjects	Elementary and Middle School CRCT Starting Points (Grades 3-8)	High School GHSGT Starting Points (Grade 11) *For 2002-03 only.**	Enhanced GHGST Starting Points
Reading/English Language Arts[13]	60	88	81.6%
Mathematics	50	81	62.3%

Figure 2: Georgia Starting AYP

Georgia's Annual Measurable Objectives (AMOs)

Reading/Language Arts CRCT Grades 3-8	Percent of Students Proficient or Advanced
2002-2003 Target	60.00
2003-2004 Target	60.00
2004-2005 Target	66.70
2005-2006 Target	66.70
2006-2007 Target	66.70
2007-2008 Target	73.30
2008-2009 Target	73.30
2009-2010 Target	**73.30**
2010-2011 Target	80.00
2011-2012 Target	86.70
2012-2013 Target	93.30
2013-2014 Target	100.00

Math CRCT Grades 3-8	Percent of Students Proficient or Advanced
2002-2003 Target	50.00
2003-2004 Target	50.00
2004-2005 Target	58.30
2005-2006 Target	58.30
2006-2007 Target	58.30
2007-2008 Target*	59.50
2008-2009 Target	59.50
2009-2010 Target	**67.60**
2010-2011 Target	77.70
2011-2012 Target	83.80
2012-2013 Target	91.90
2013-2014 Target	100.00

English/Language Arts GHSGT* Grade 11	Percent of Students Proficient or Advanced
2002-2003 Target	88.00
2003-2004 Target	81.60
2004-2005 Target	81.60
2005-2006 Target	84.70
2006-2007 Target	84.70
2007-2008 Target	87.70
2008-2009 Target	87.70
2009-2010 Target	**87.70**
2010-2011 Target	90.80
2011-2012 Target	93.90
2012-2013 Target	96.90
2013-2014 Target	100.00

Math GHSGT* Grade 11	Percent of Students Proficient or Advanced
2002-2003 Target	81.00
2003-2004 Target	62.30*
2004-2005 Target	62.30
2005-2006 Target	68.60
2006-2007 Target	68.60
2007-2008 Target	74.90
2008-2009 Target	74.90
2009-2010 Target	**74.90**
2010-2011 Target	81.20
2011-2012 Target	87.40
2012-2013 Target	93.70
2013-2014 Target	100.00

Figure 3: Georgia Test Pass Rate for AYP

School Year	High School AYP Second Indicator Graduation Rate Standard
2006-2007	**65% or greater**; or Second Looks: 1) apply multi-year average to achieve 65%; or 2) increase by 10% from the preceding year from a minimum threshold of 50%
2007-2008	**70% or greater**; or Second Looks: 1) apply multi-year average to achieve 70%; or 2) increase by 10% from the preceding year from a minimum threshold of 50%
2008-2009	**75% or greater**; or Second Looks: 1) apply multi-year average to achieve 75%; or 2) increase by 10% from the preceding year from a minimum threshold of 55%
2009-2010	**80% or greater**; or Second Looks: 1) apply multi-year average to achieve 80%; or 2) increase by 10% from the preceding year from a minimum threshold of 60%
2010-2011	**85% or greater**; or Second Looks: 1) apply multi-year average to achieve 85%; or 2) increase by 10% from the preceding year from a minimum threshold of 60%
2011-2012	**90% or greater**; or Second Looks: 1) apply multi-year average to achieve 90%; or 2) increase by 10% from the preceding year from a minimum threshold of 70%
2012-2013	**95% or greater**; or Second Looks: 1) apply multi-year average to achieve 95%; or 2) increase by 10% from the preceding year from a minimum threshold of 70%
2013-2014	**100%**; or Second Looks: 1) apply multi-year average to achieve 100%; or 2) increase by 10% from the preceding year from a minimum threshold of 80%

Figure 4: Georgia High School AYP Time Line

LEAs: Table of Consequences/Interventions

Needs Improvement Status	LEA Consequences/Interventions
Did Not Make AYP Year 1	No Consequences
NI 1	Develop LEA Improvement Plan
NI 2	Implement LEA Improvement Plan
NI 3	Develop and implement LEA Corrective Action Plan for a minimum of a two-year period. (The Corrective Action Plan is integrated with the LEA Improvement Plan.)
NI 4 (Guidance is under development regarding consequences/interventions for LEAs beyond NI 3.)	*Continue to Implement LEA Corrective Action Plan Additions To Be Determined*

Figure 5: School District Consequences

Appendix E: Schools: Table of Consequences/Interventions

Needs Improvement Status	Consequences/Interventions
Did Not Make AYP Year 1	No Consequences
NI 1	School Choice; Develop School Improvement Plan
NI 2	School Choice; Supplemental Services; Implement School Improvement Plan
NI 3	School Choice; Supplemental Services; Continue School Improvement Plan; Develop/Implement School Corrective Action Plan
NI 4	School Choice; Supplemental Services; Implement School Corrective Action Plan; Plan for Restructuring
NI 5	School Choice; Supplemental Services; Continue School Corrective Action; Implement School Restructuring Plan
NI 6	School Choice; Supplemental Services; Implement School Restructuring Plan; GaDOE School Performance Review and Needs Assessment; Develop Improvement Contract
NI 7	School Choice; Supplemental Services; Implement Improvement Contract; Contract-Monitored School Year 1
NI 8	School Choice; Supplemental Services; Contract-Monitored School Year 2; Update Improvement Contract; GaDOE System Performance Review and Needs Assessment; Develop Management Contract
NI 9	School Choice; Supplemental Services; Implement Management Contract; Contract-Managed School Year 1
NI 10	School Choice; Supplemental Services; Contract-Managed School Year 2; Update Management Contract

Figure 6: School Consequences

Hypothesis Testing Normality

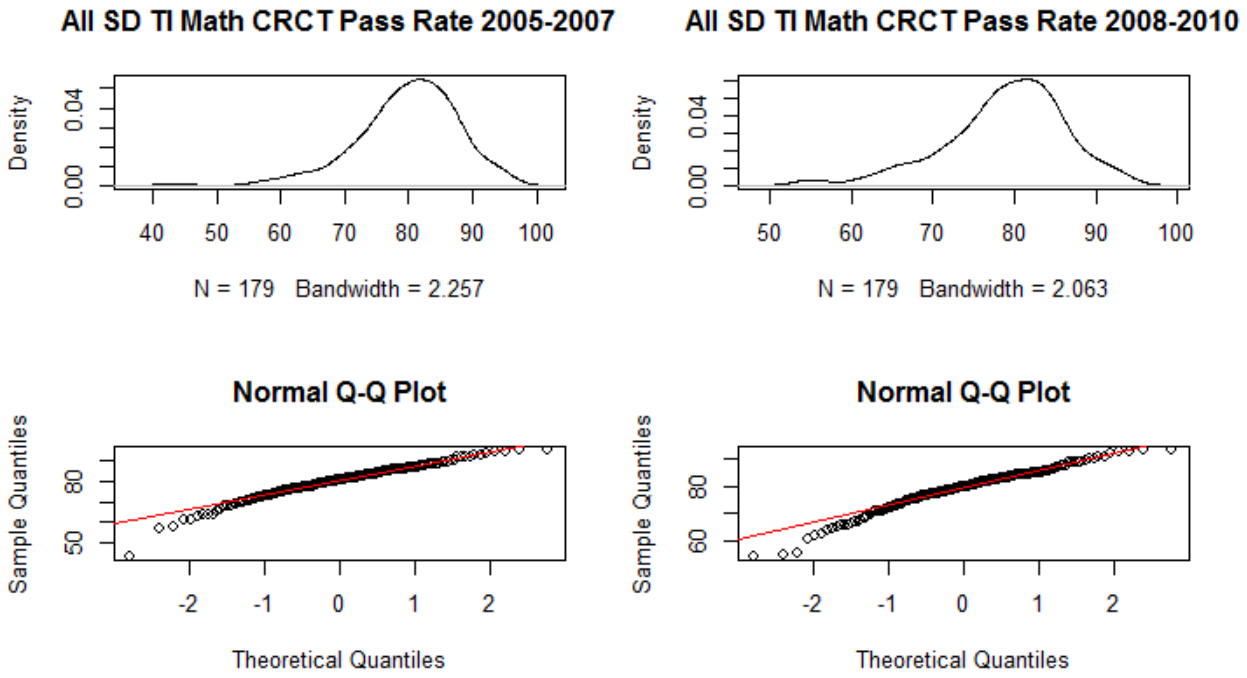

Figure 7: Title I Math CRCT Normality

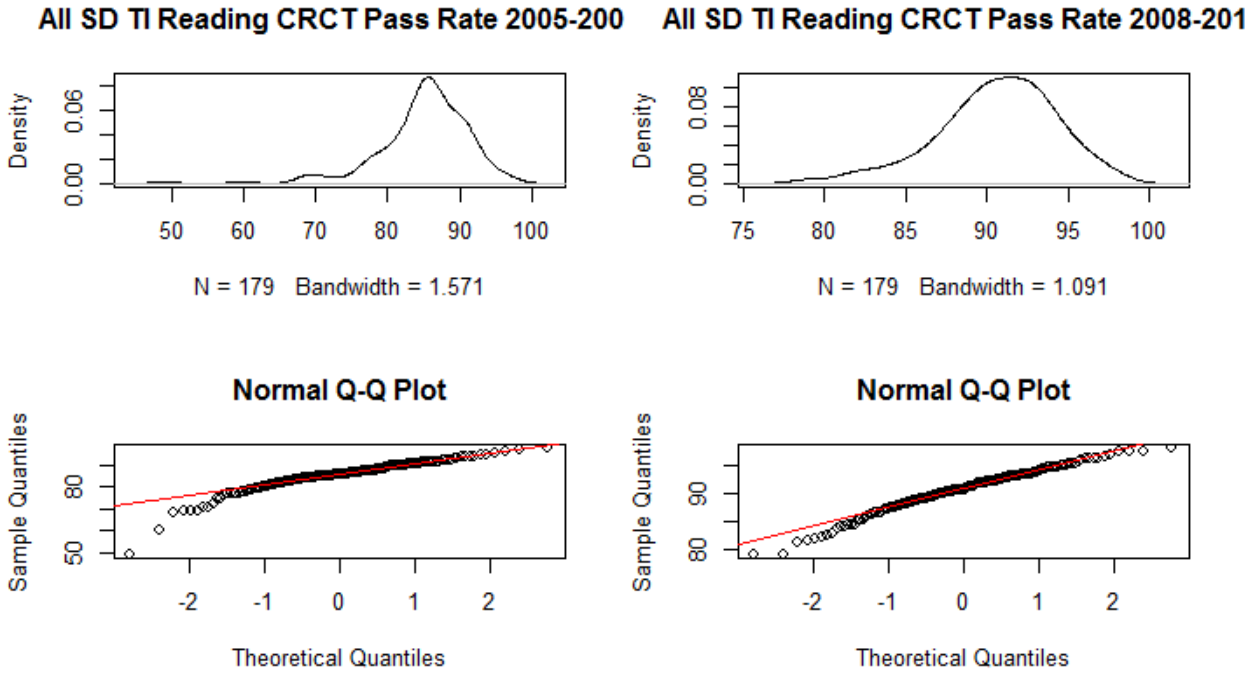

Figure 8: Title I Reading CRCT Normality

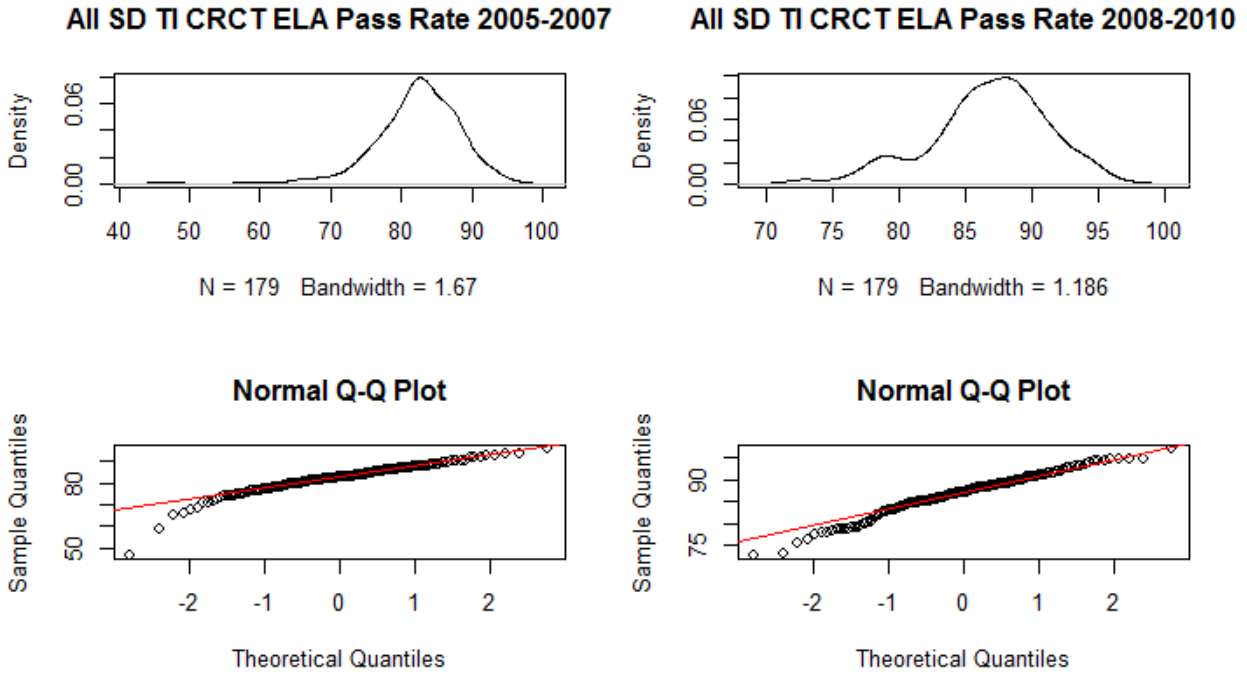

Figure 9: Title I English-Language Arts CRCT Normality

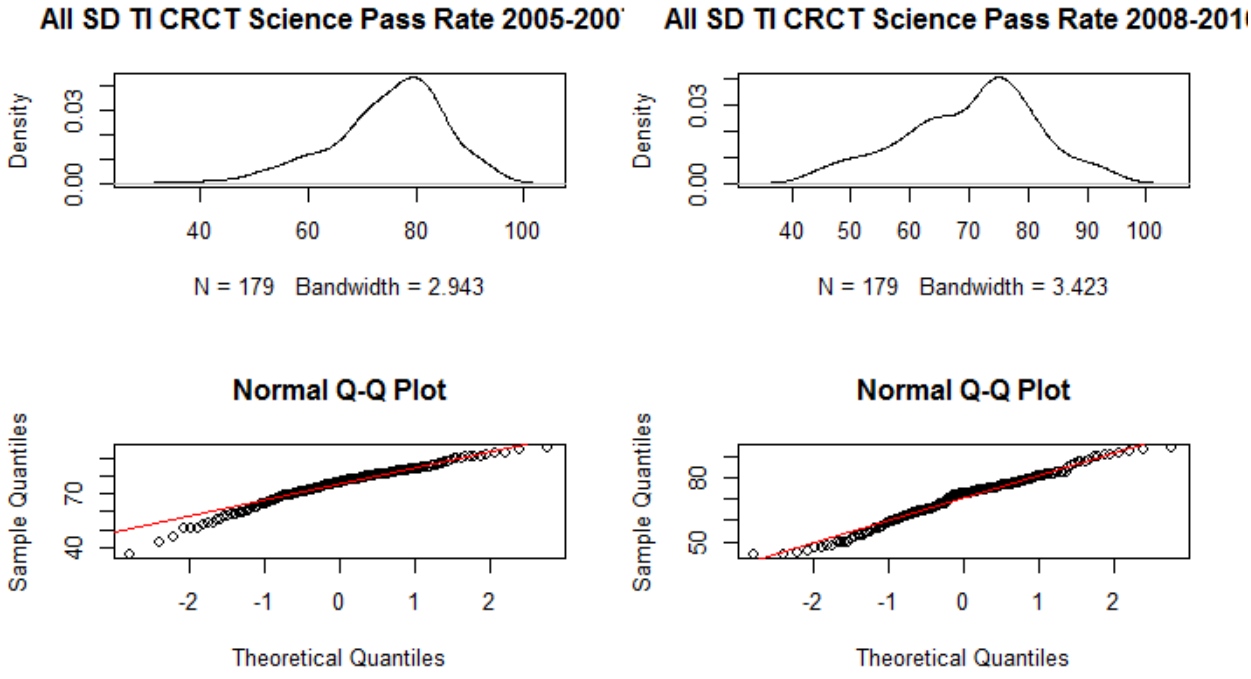

Figure 10: Title I Science CRCT Normality

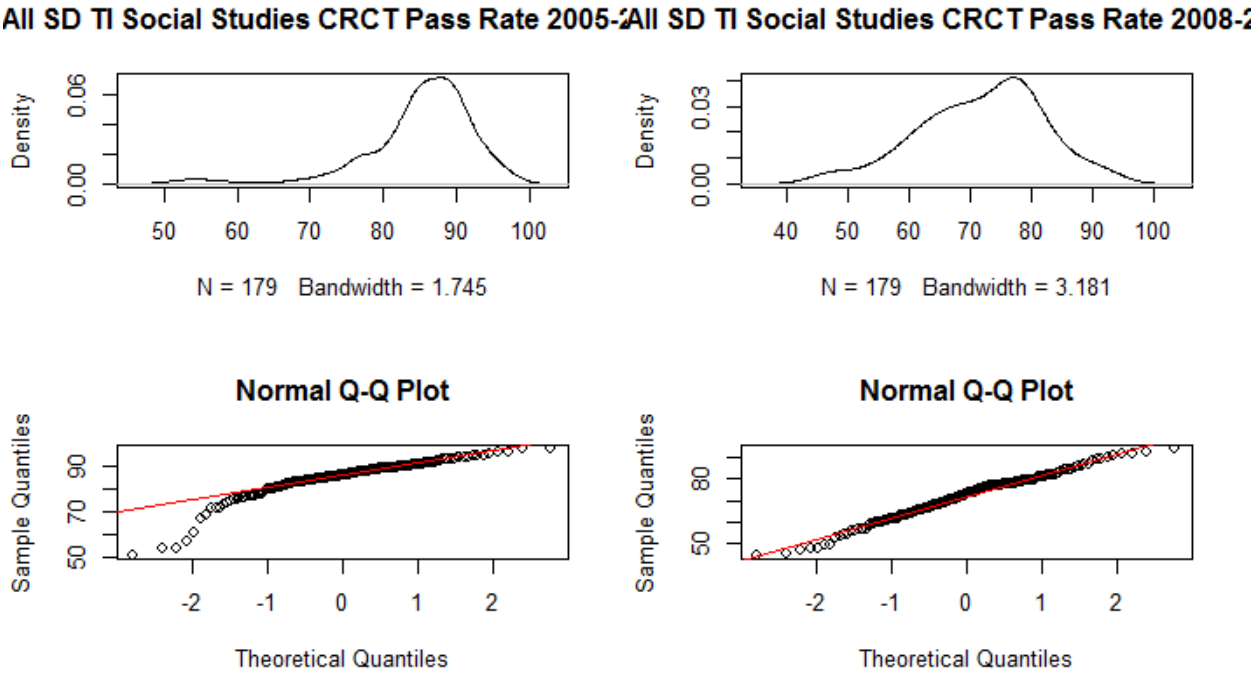

Figure 11: Title I Social Studies CRCT Normality

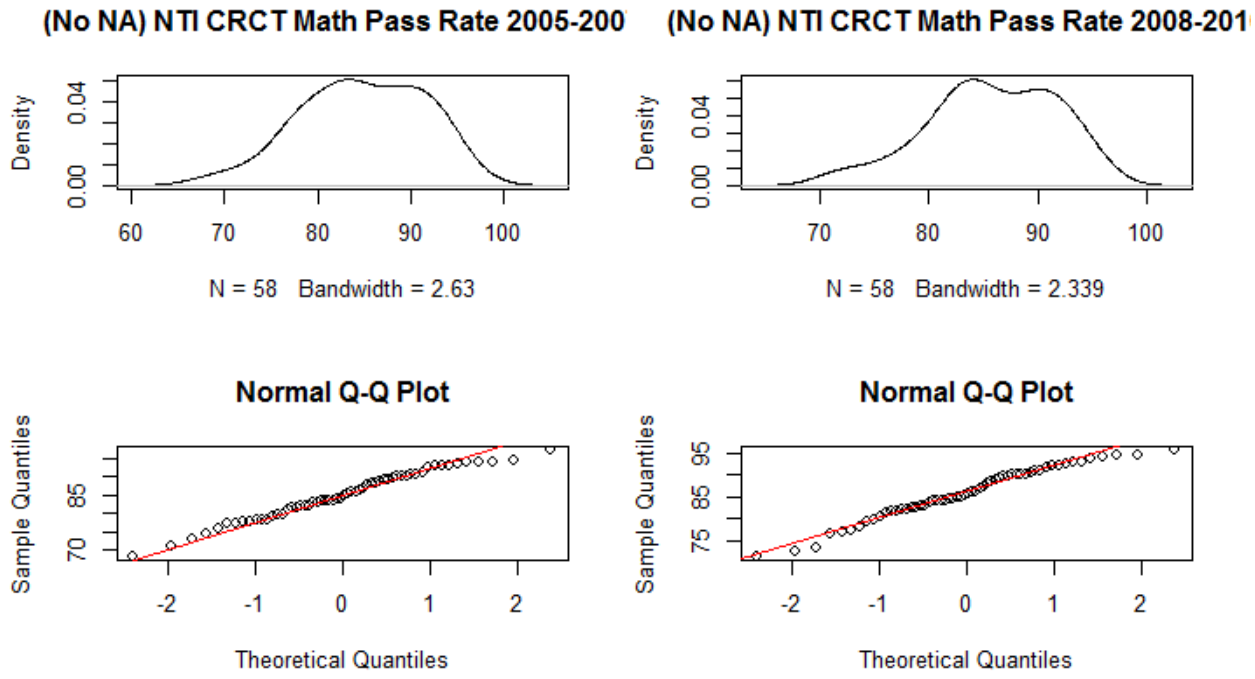

Figure 12: Non-Title I Math CRCT Normality

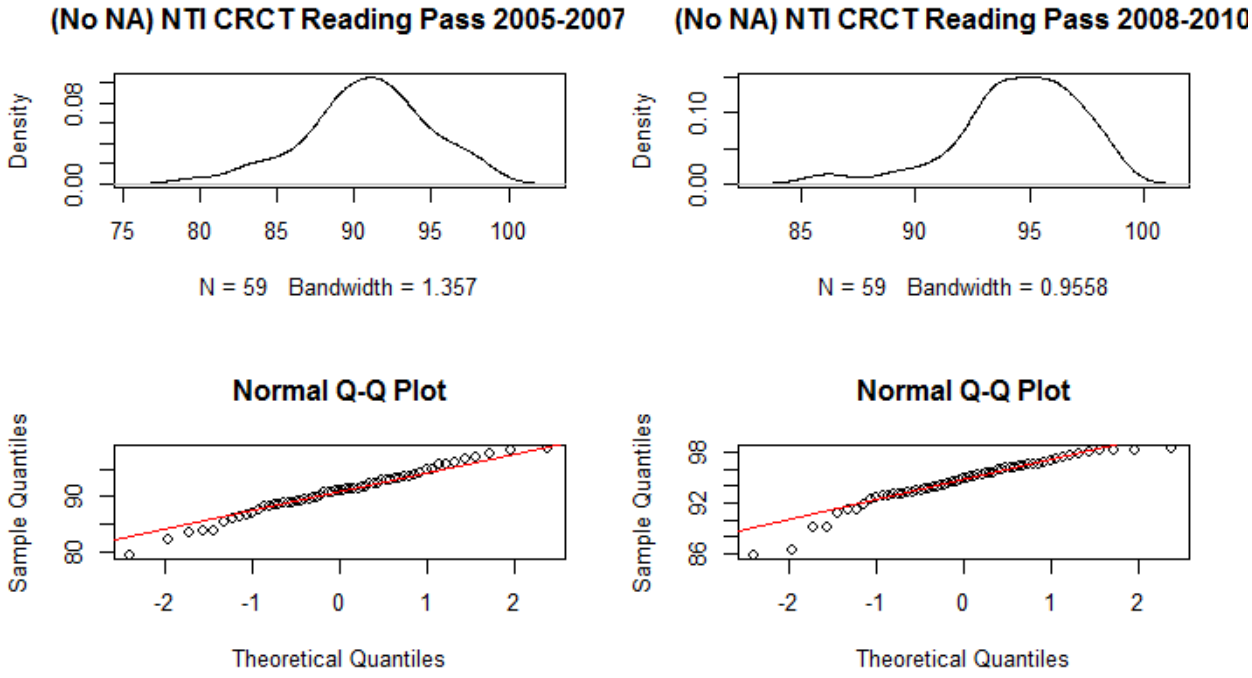

Figure 13: Non-Title I Reading CRCT Normality

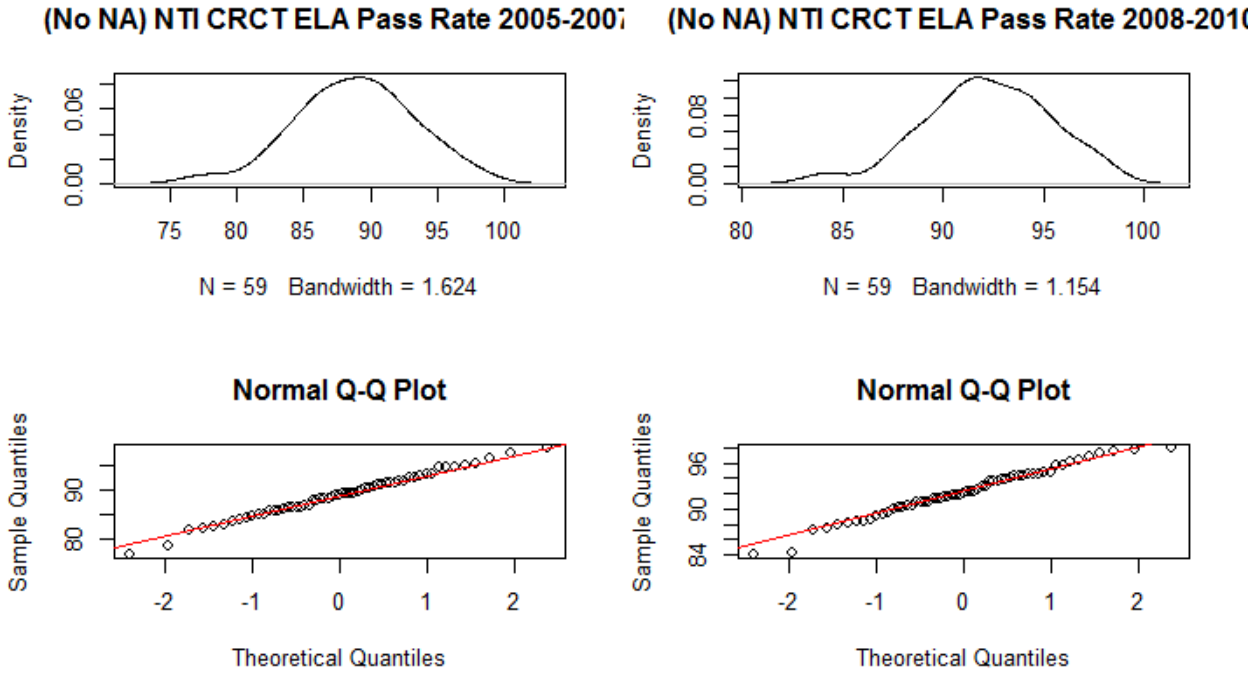

Figure 14: Non-Title I English-Language Arts CRCT Normality

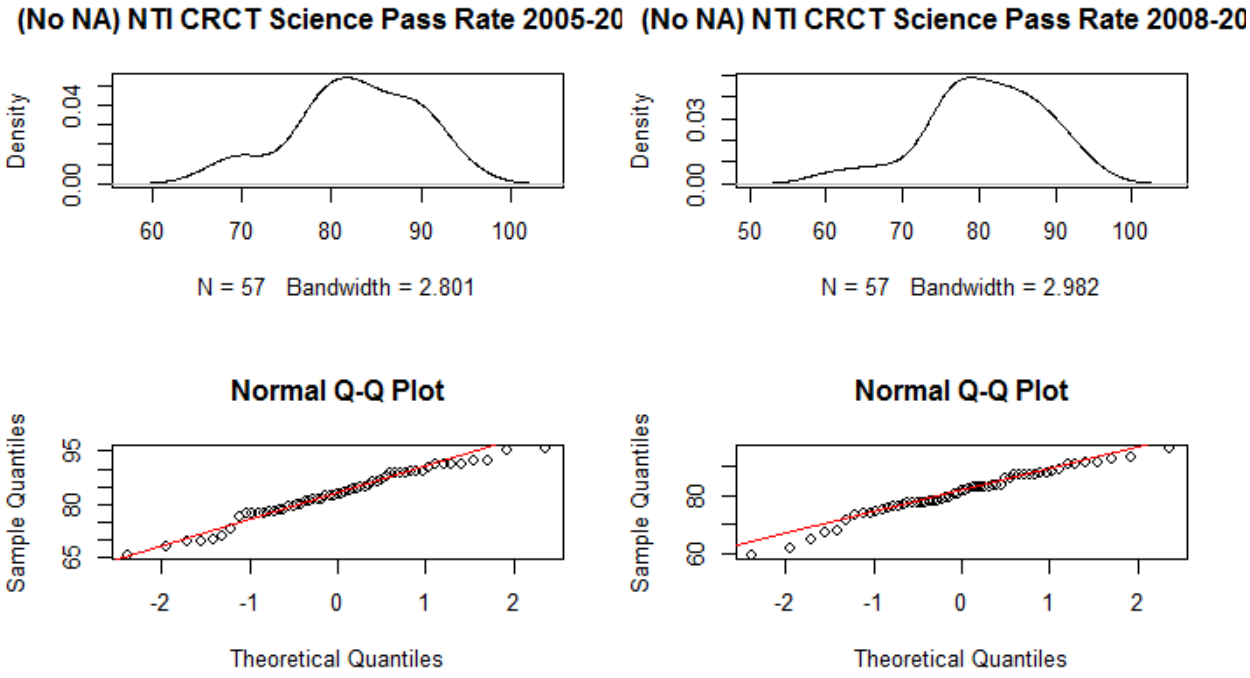

Figure 15: Non-Title I Science CRCT Normality

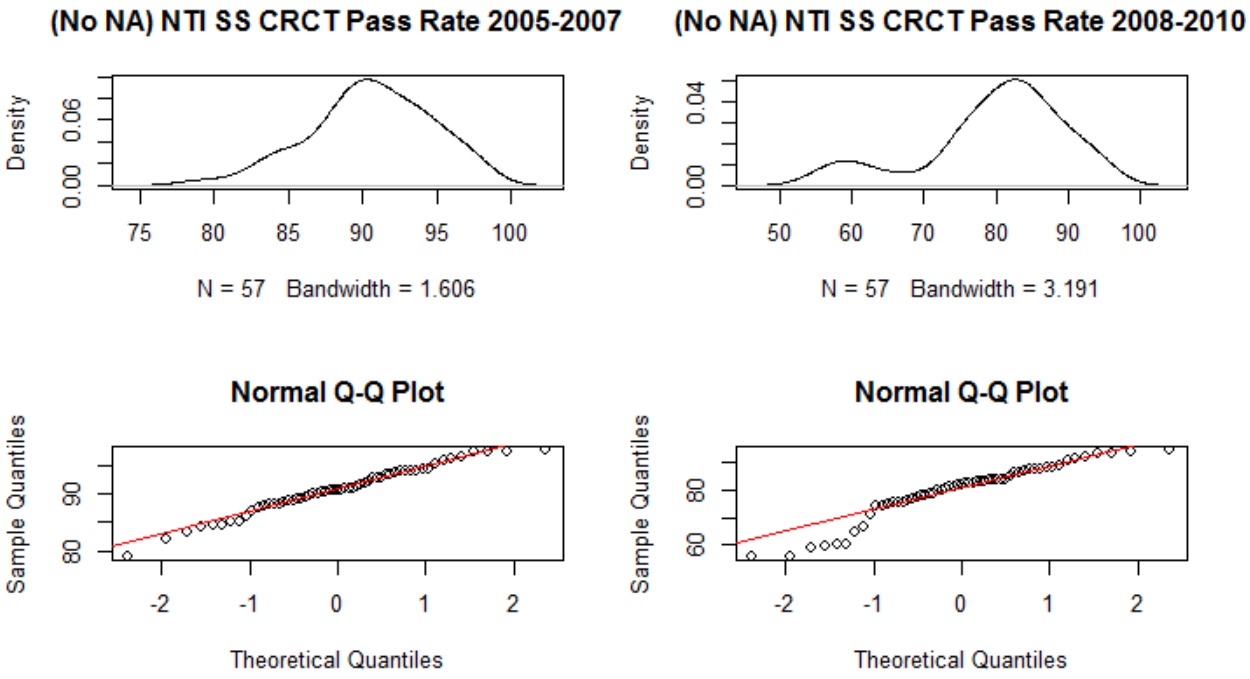

Figure 16: Non-Title I Social Studies CRCT Normality

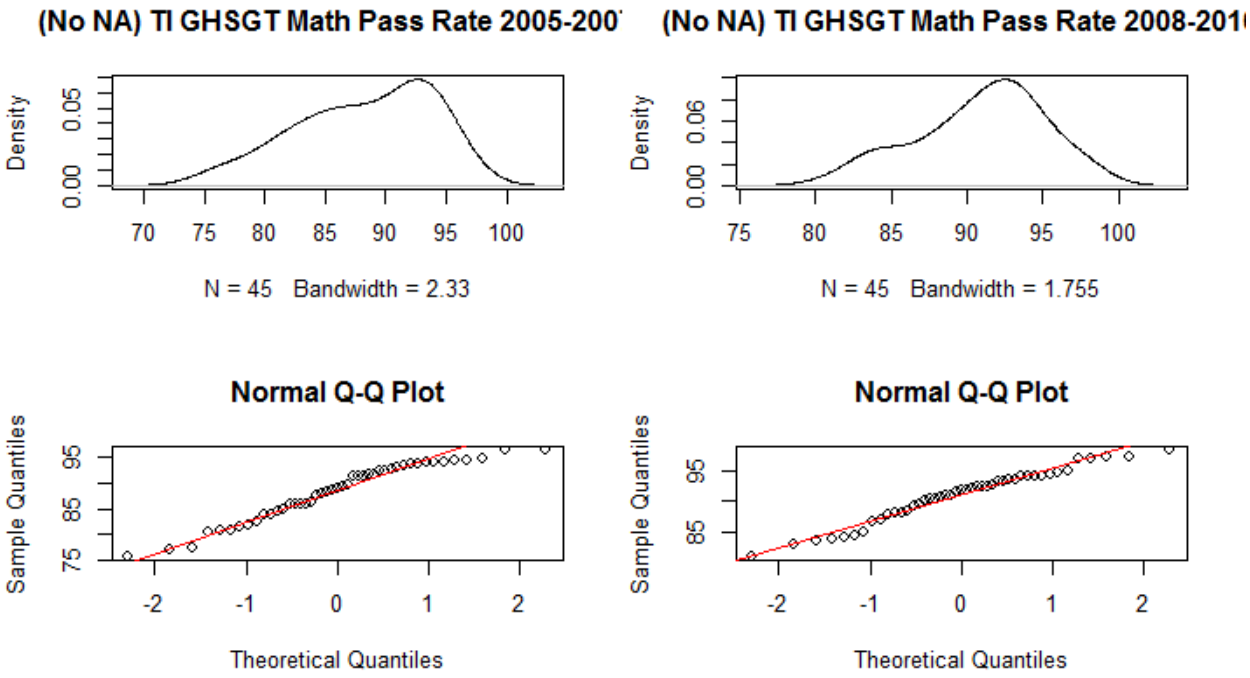

Figure 17: Title I Math GHSGT Normality

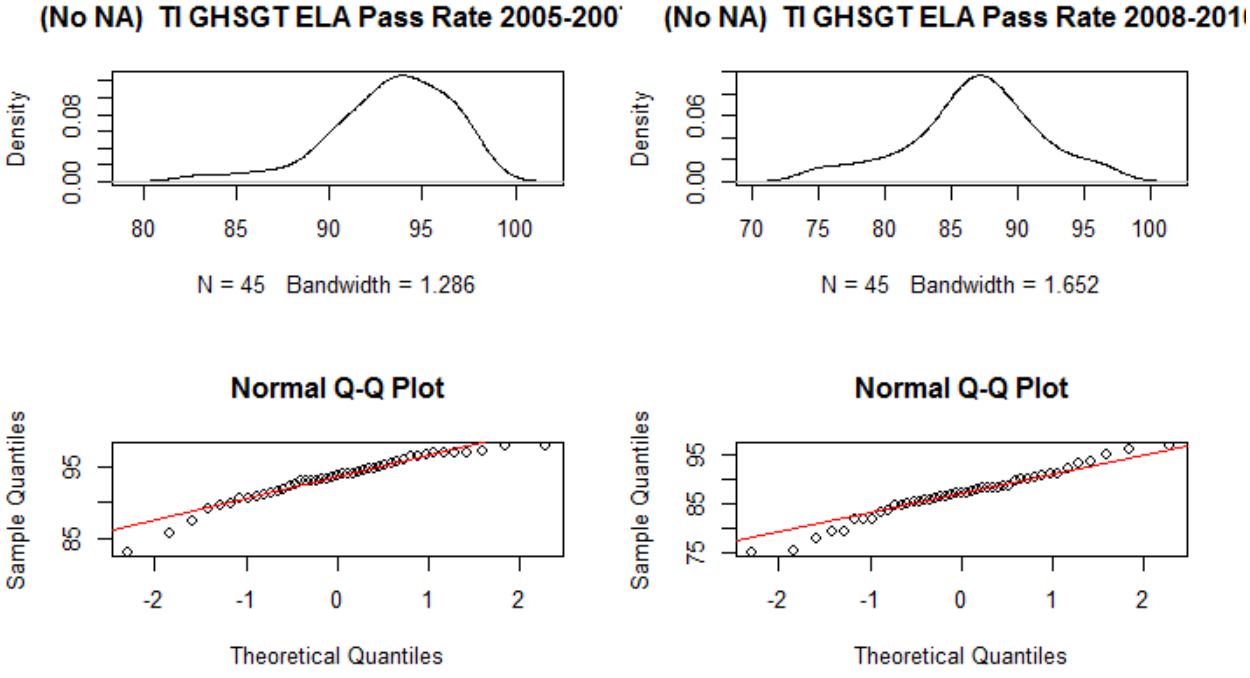

Figure 18: Title I English-Language Arts GHSGT Normality

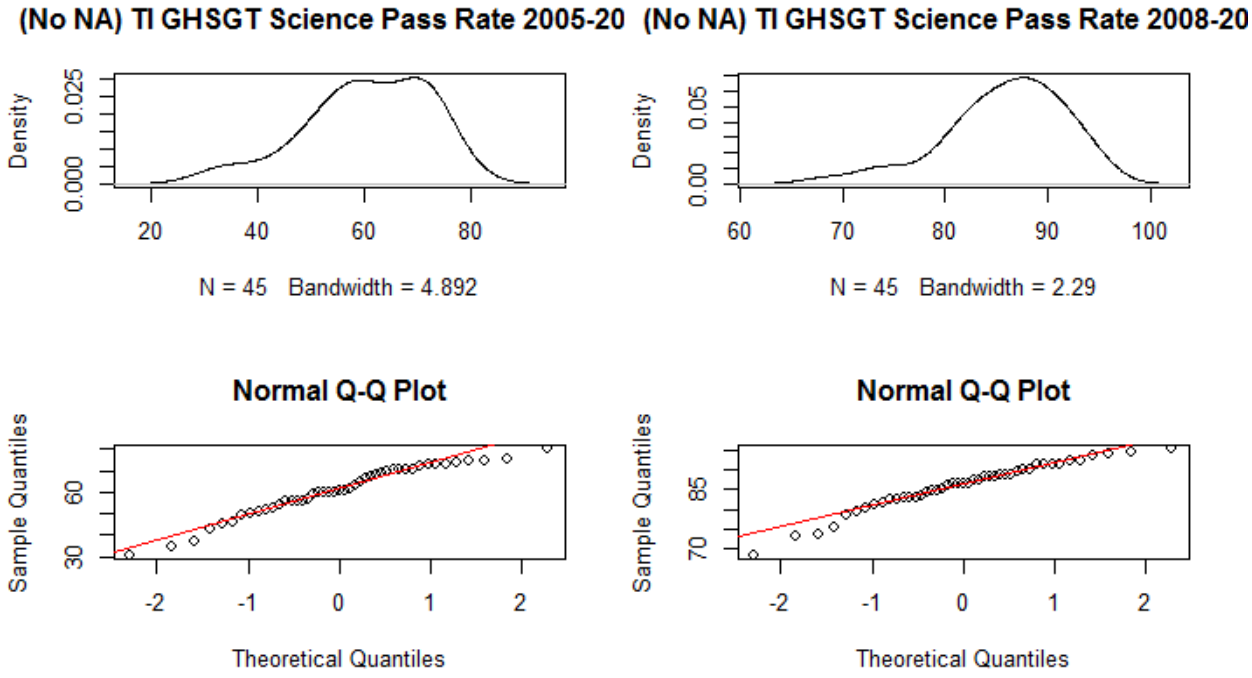

Figure 19: Title I Science GHSGT Normality

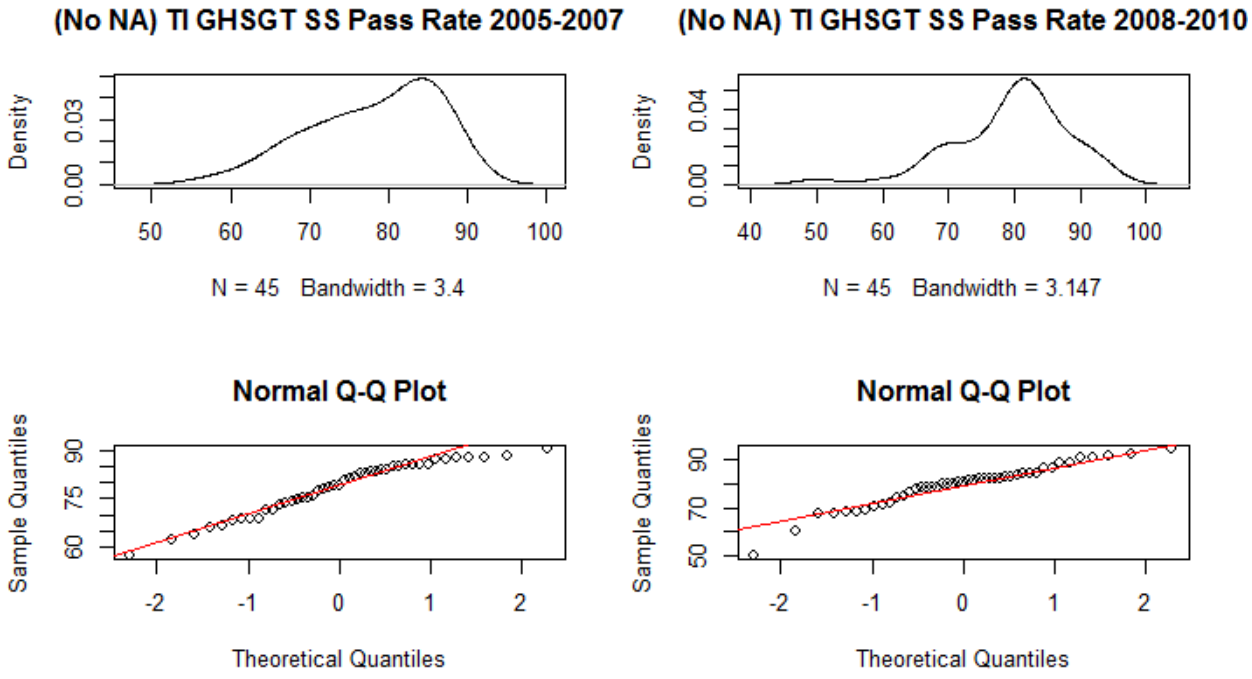

Figure 20: Title I Social Science GHSGT Normality

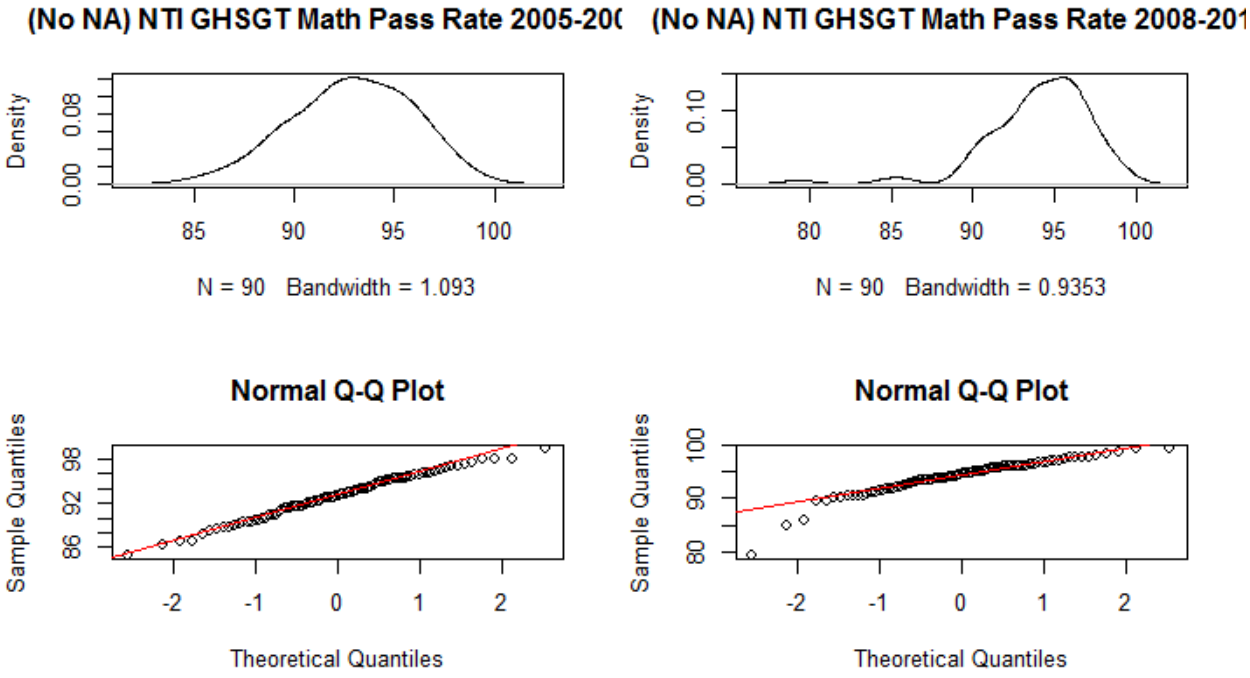

Figure 21: Non-Title I Math GHSGT Normality

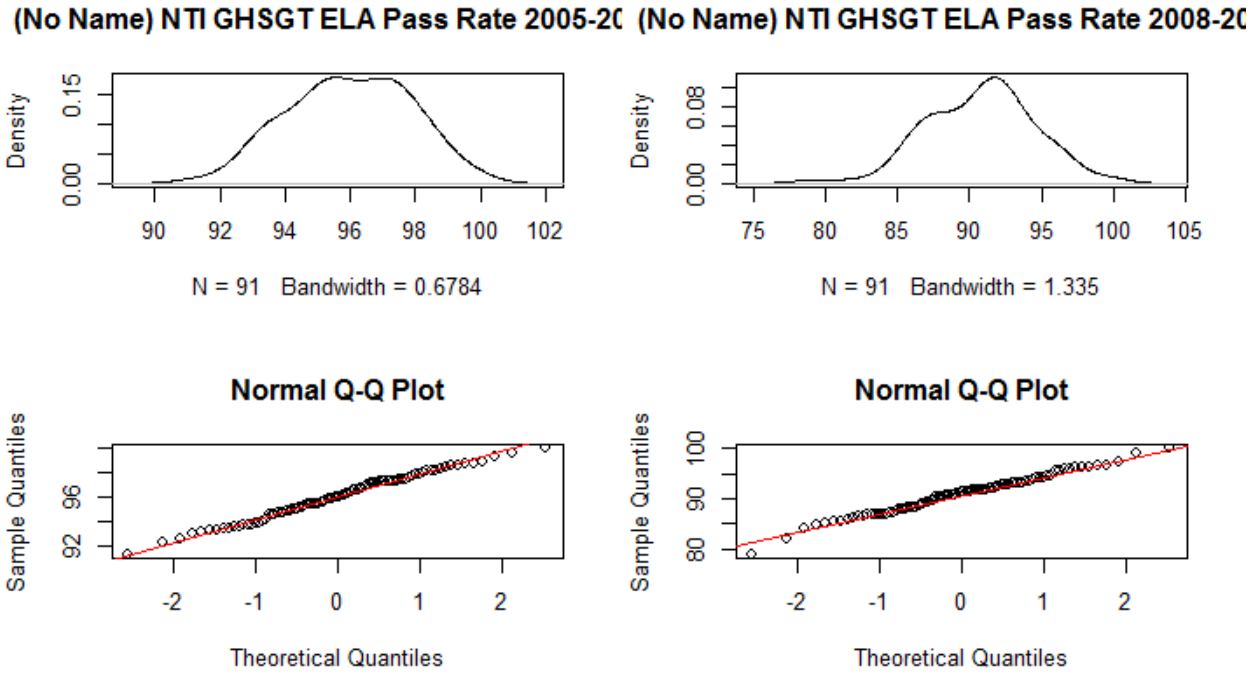

Figure 22: Non-Title I English-Language Arts GHSGT Normality

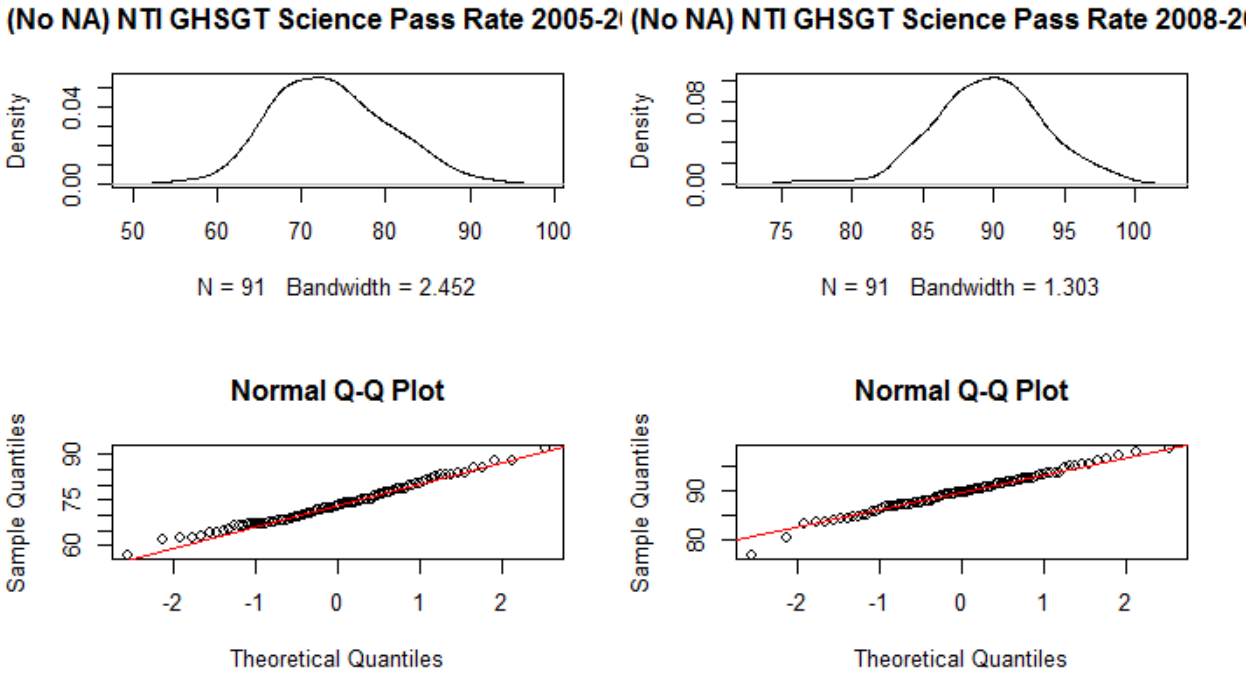

Figure 23: Non-Title I Science GHSGT Normality

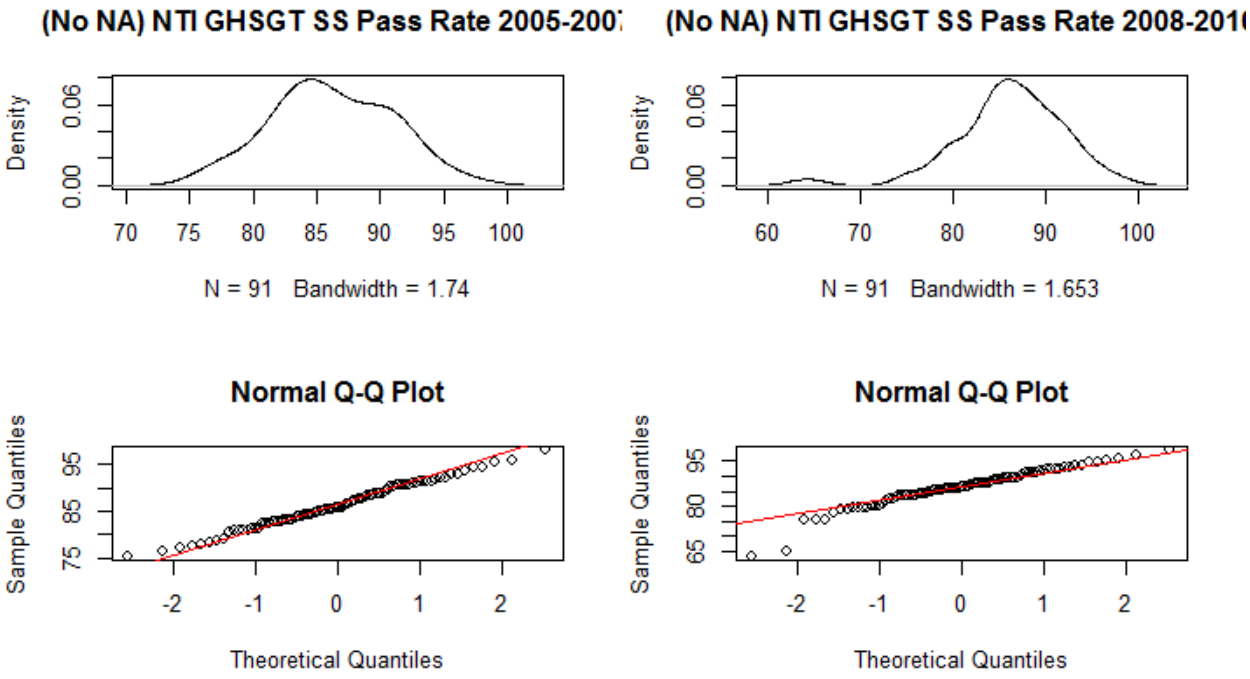

Figure 24: Non-Title I Math GHSGT Normality

Pass Rates Over Time

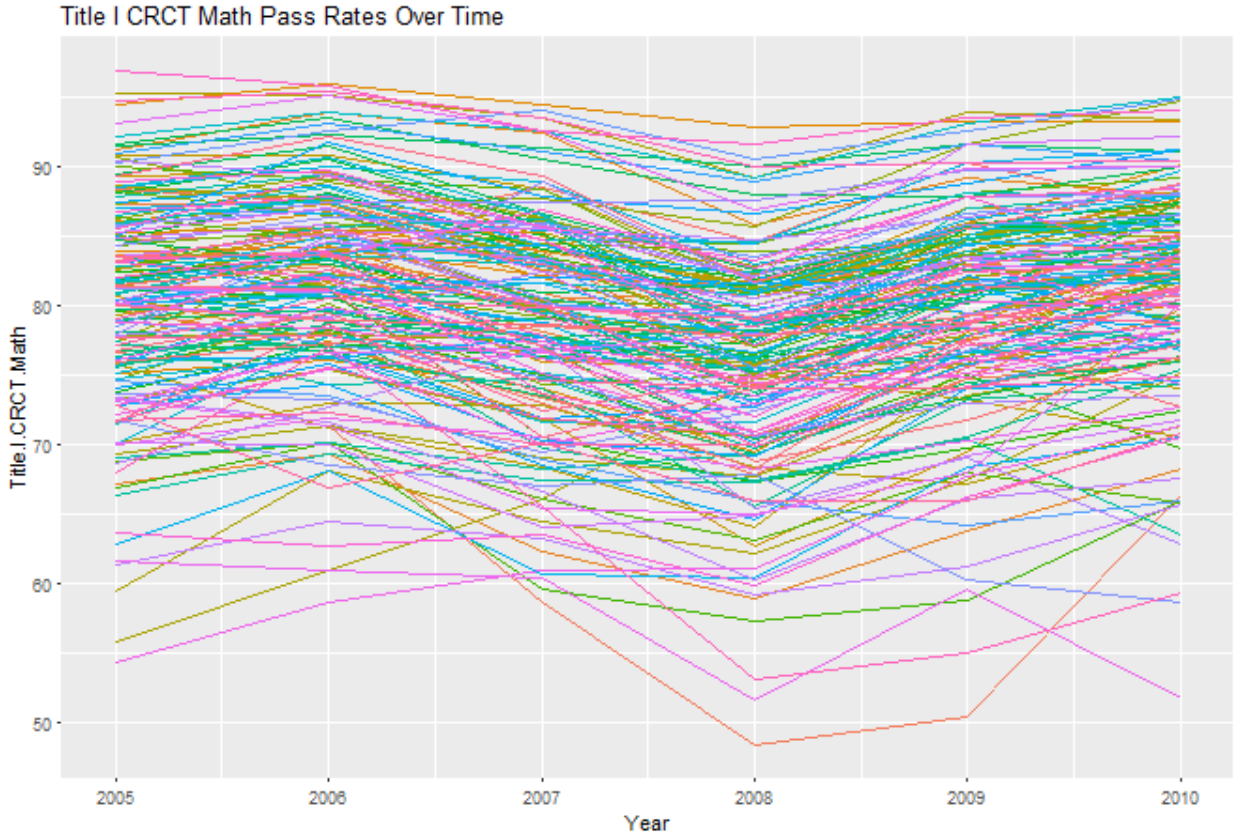

Figure 25: Title I CRCT Math Pass Rates

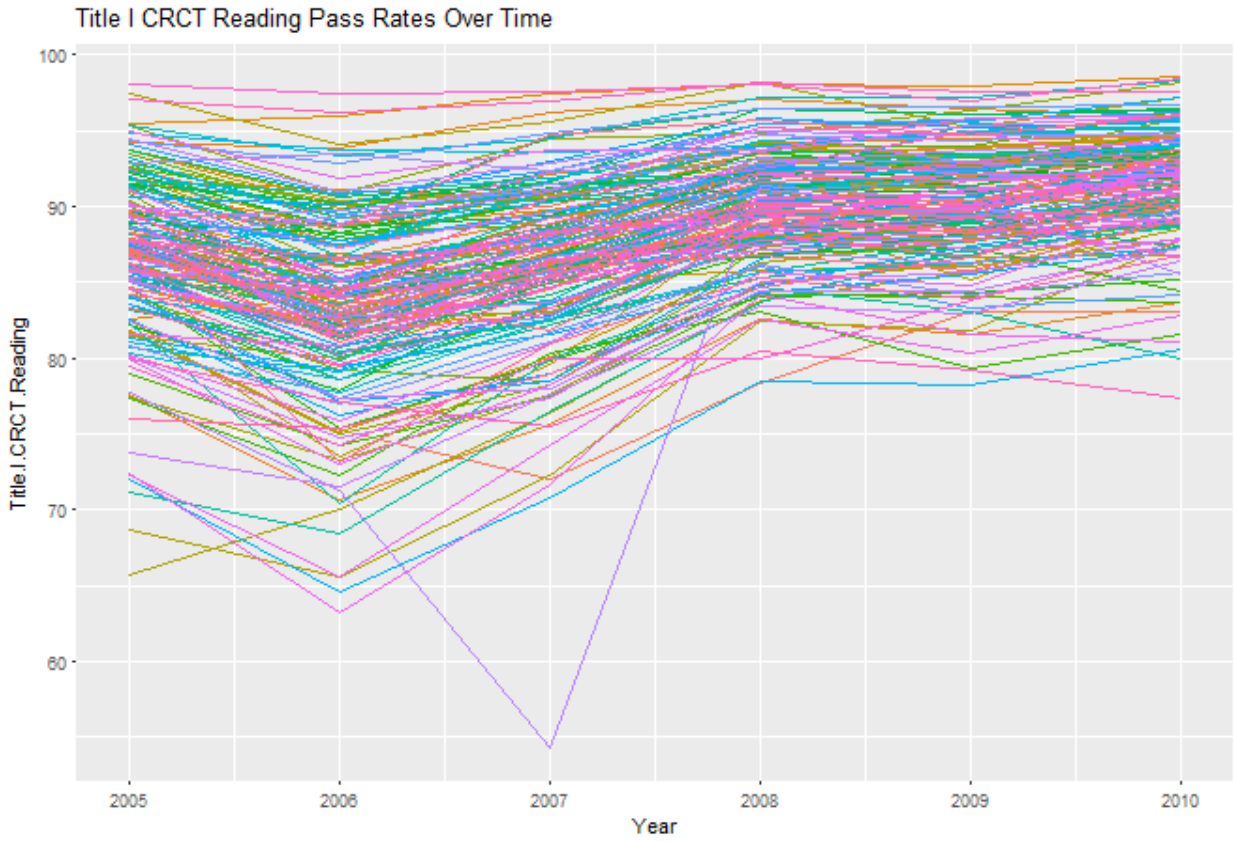

Figure 26: Title I CRCT Reading Pass Rates

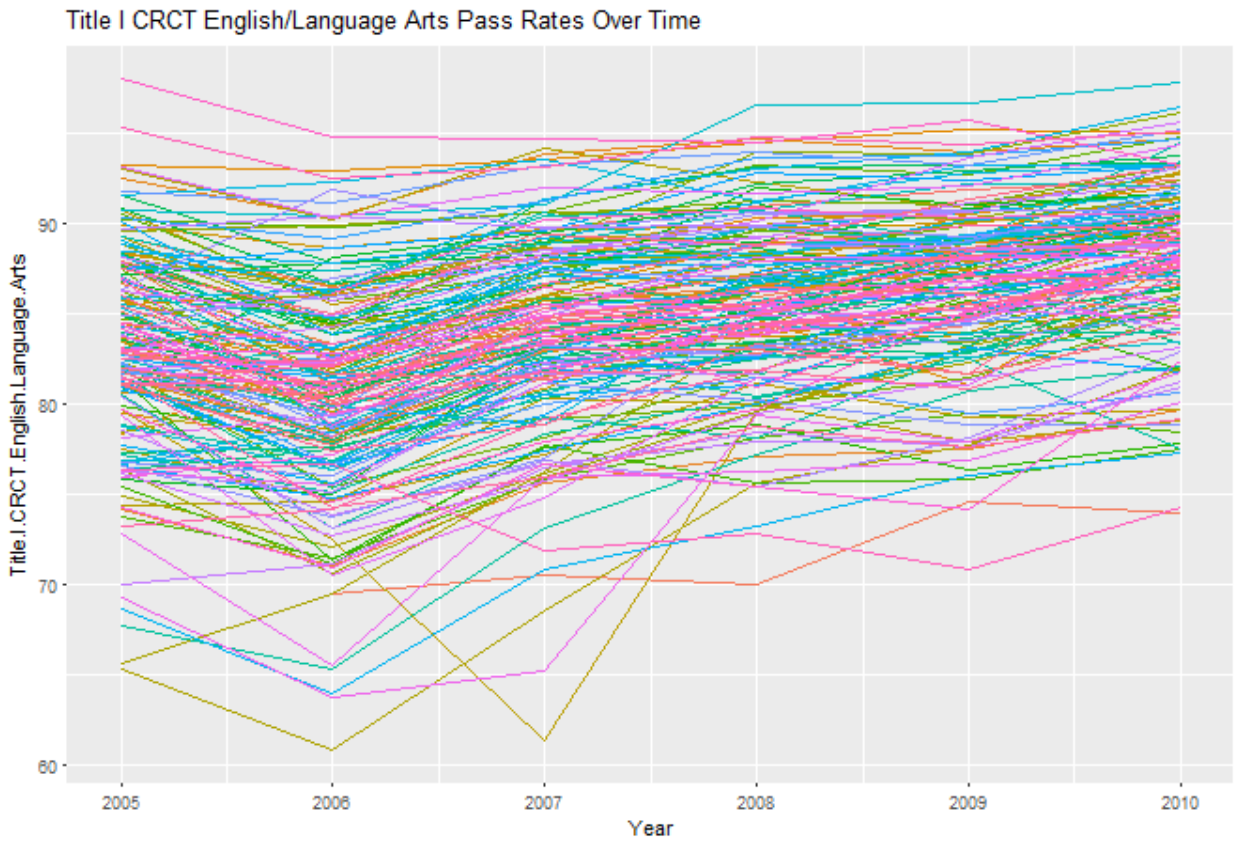

Figure 27: Title I CRCT English-Language Arts Pass Rates

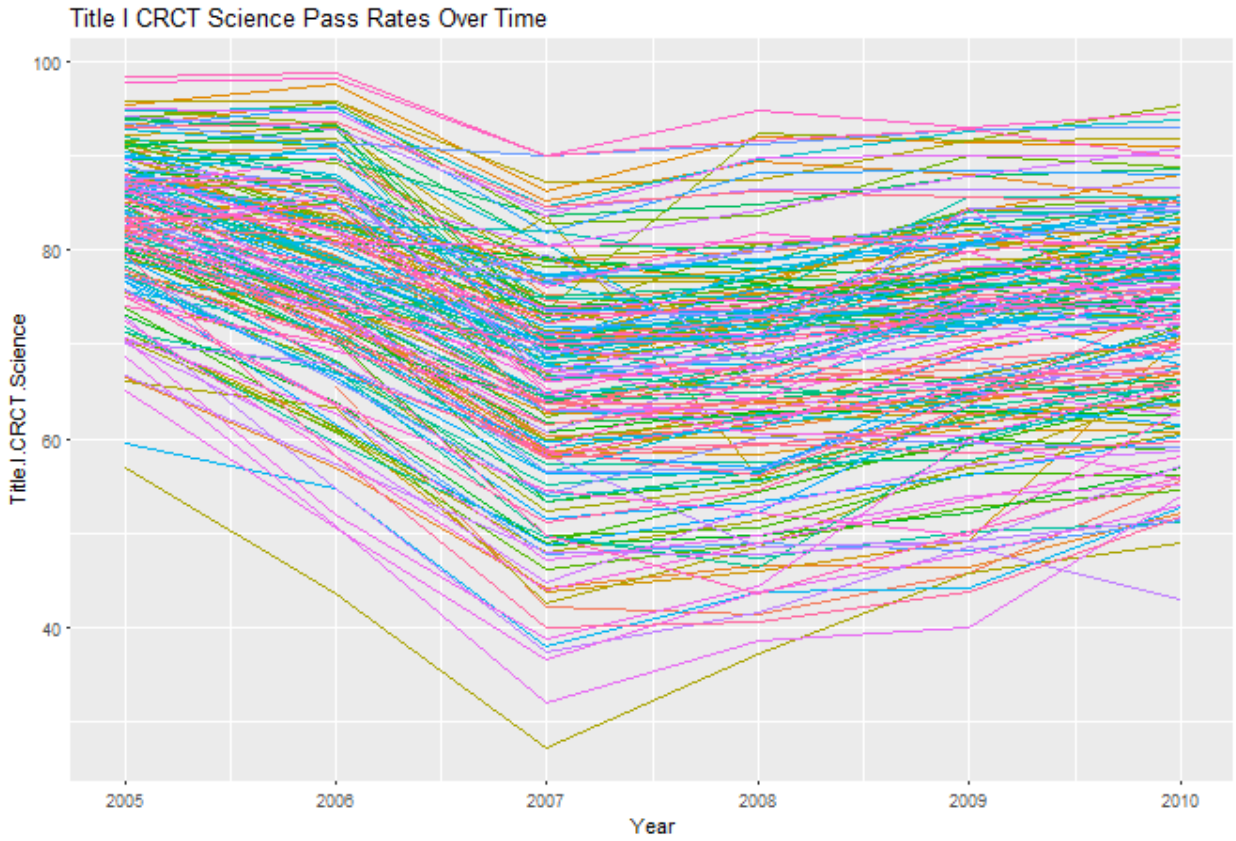

Figure 28: Title I CRCT Science Pass Rates

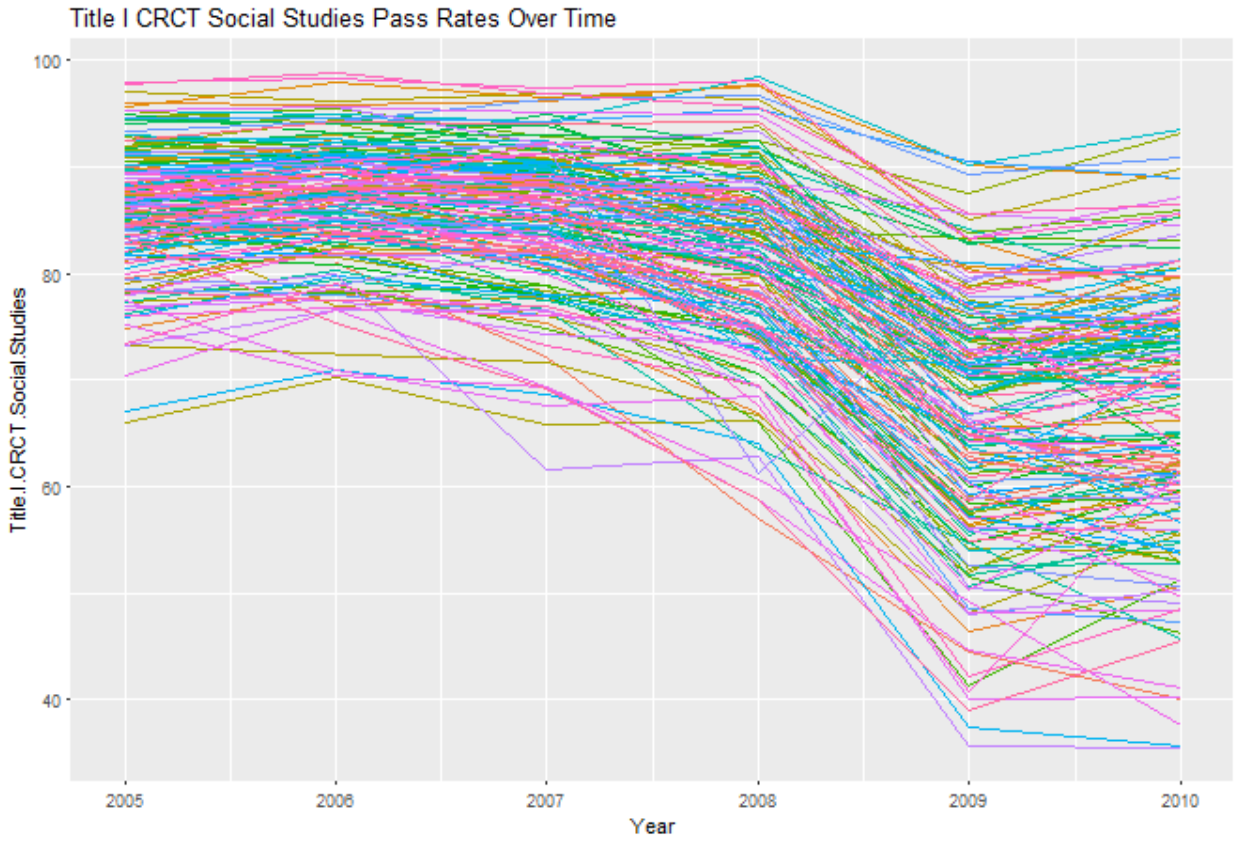

Figure 29: Title I CRCT Social Studies Pass Rates

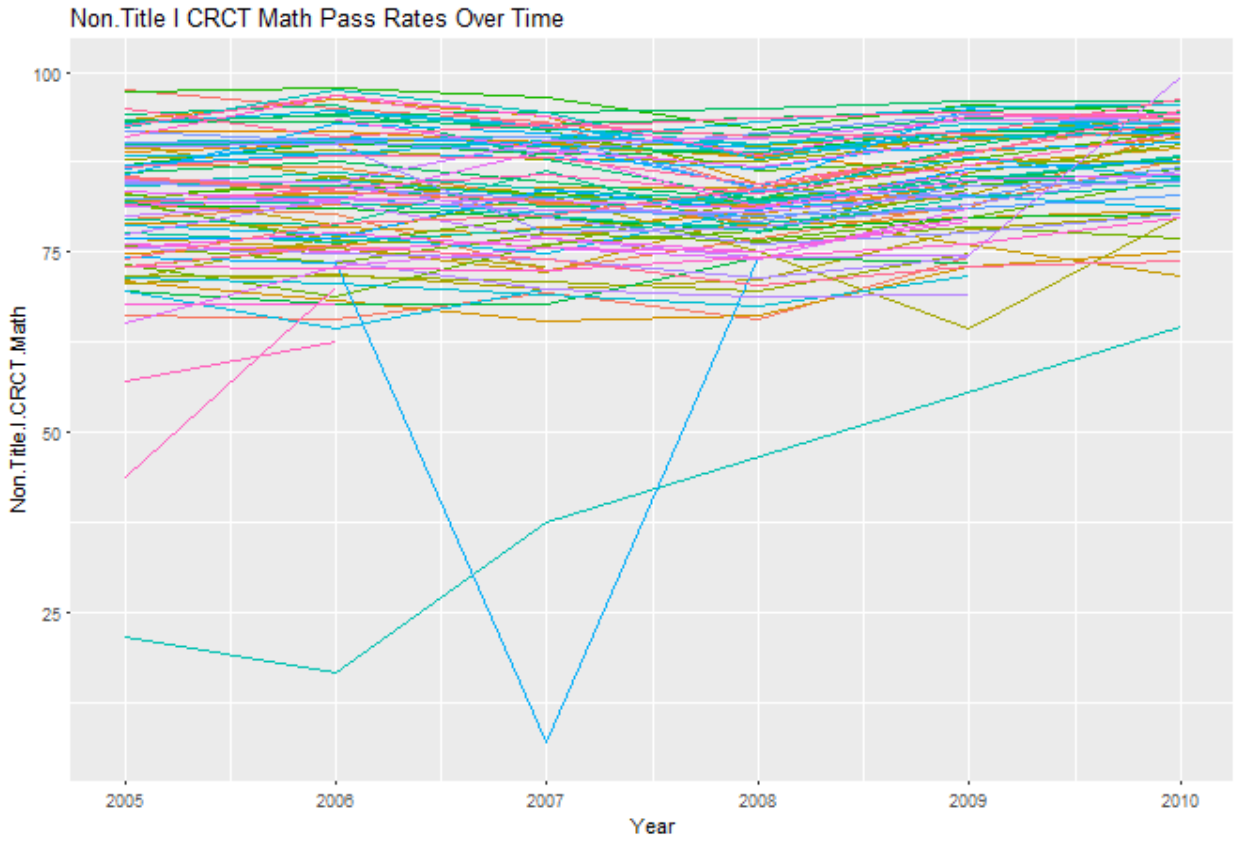

Figure 30: Non-Title I CRCT Math Pass Rates

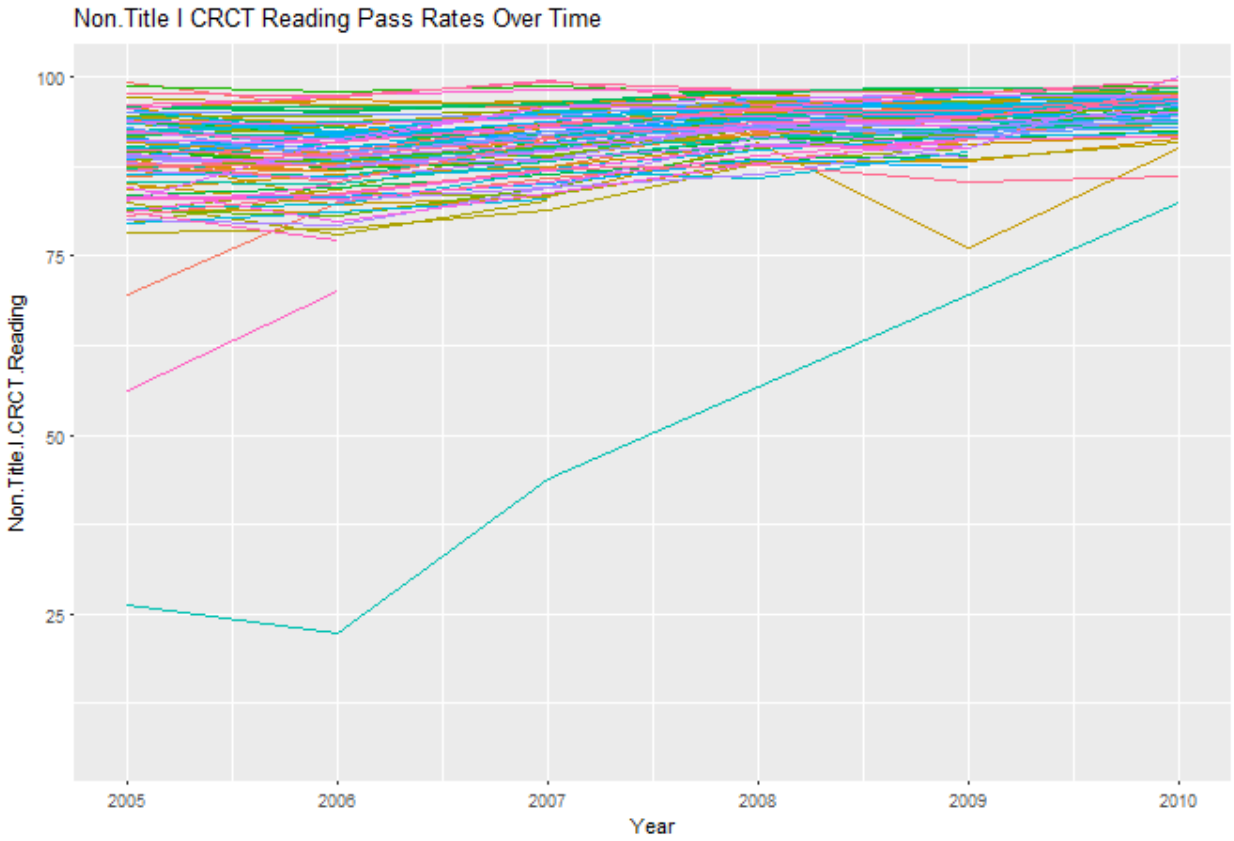

Figure 31: Non-Title I CRCT Reading Pass Rates

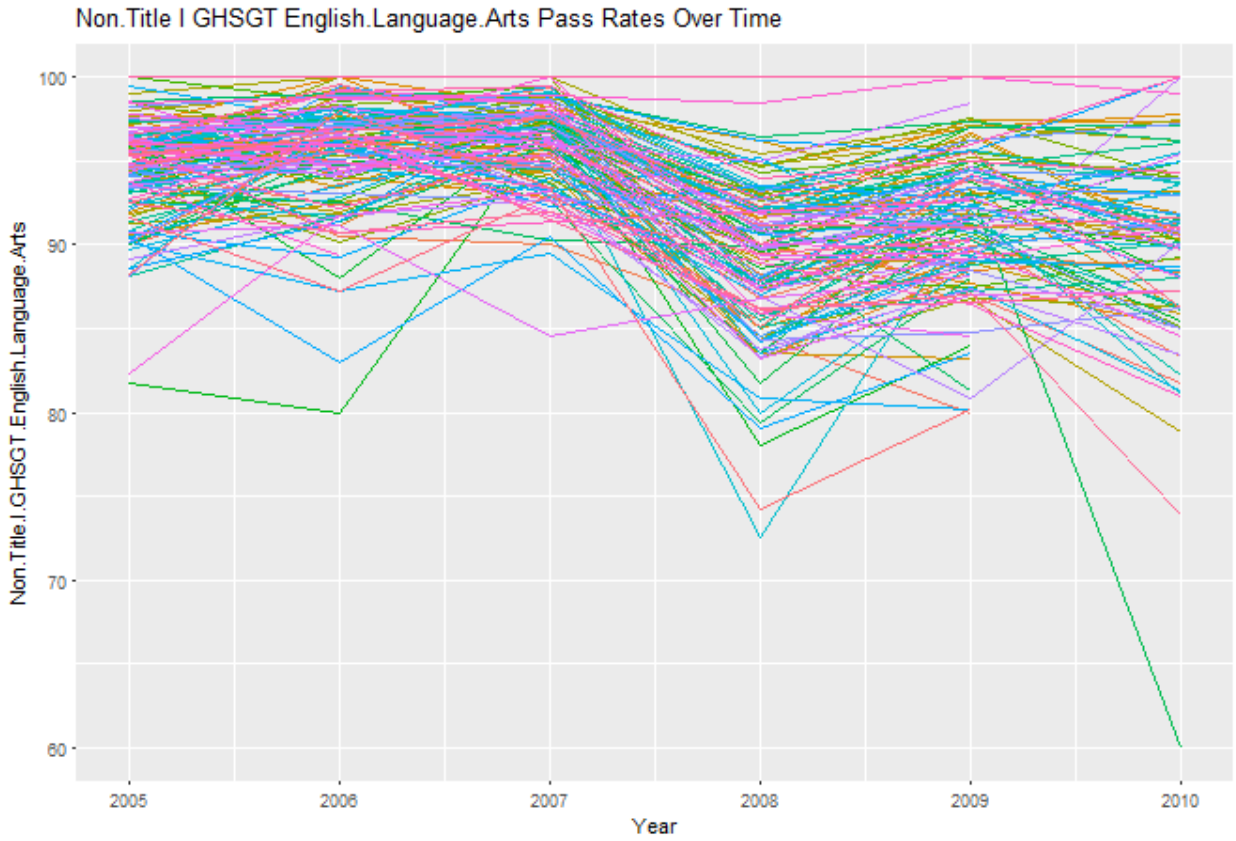

Figure 32: Non-Title I CRCT English-Language Arts Pass Rates

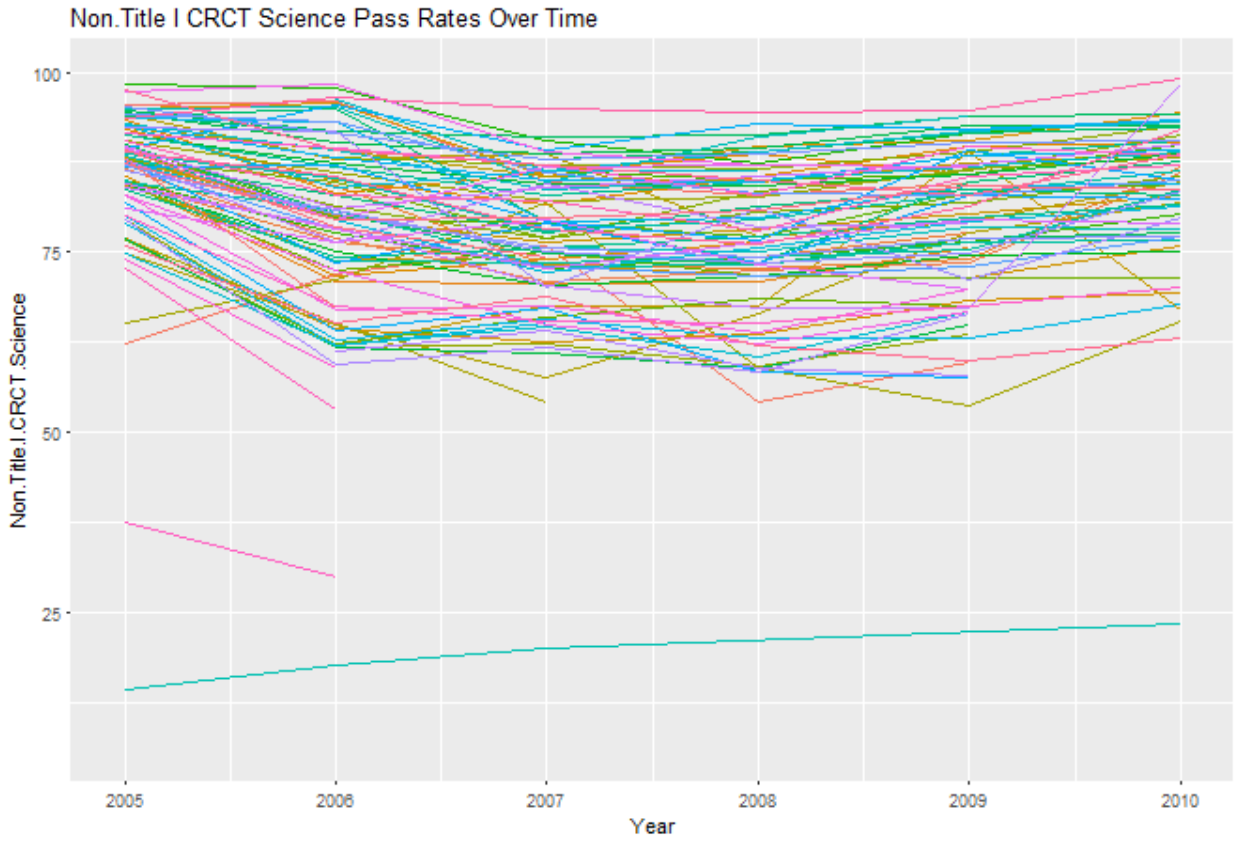

Figure 33: Non-Title I CRCT Science Pass Rates

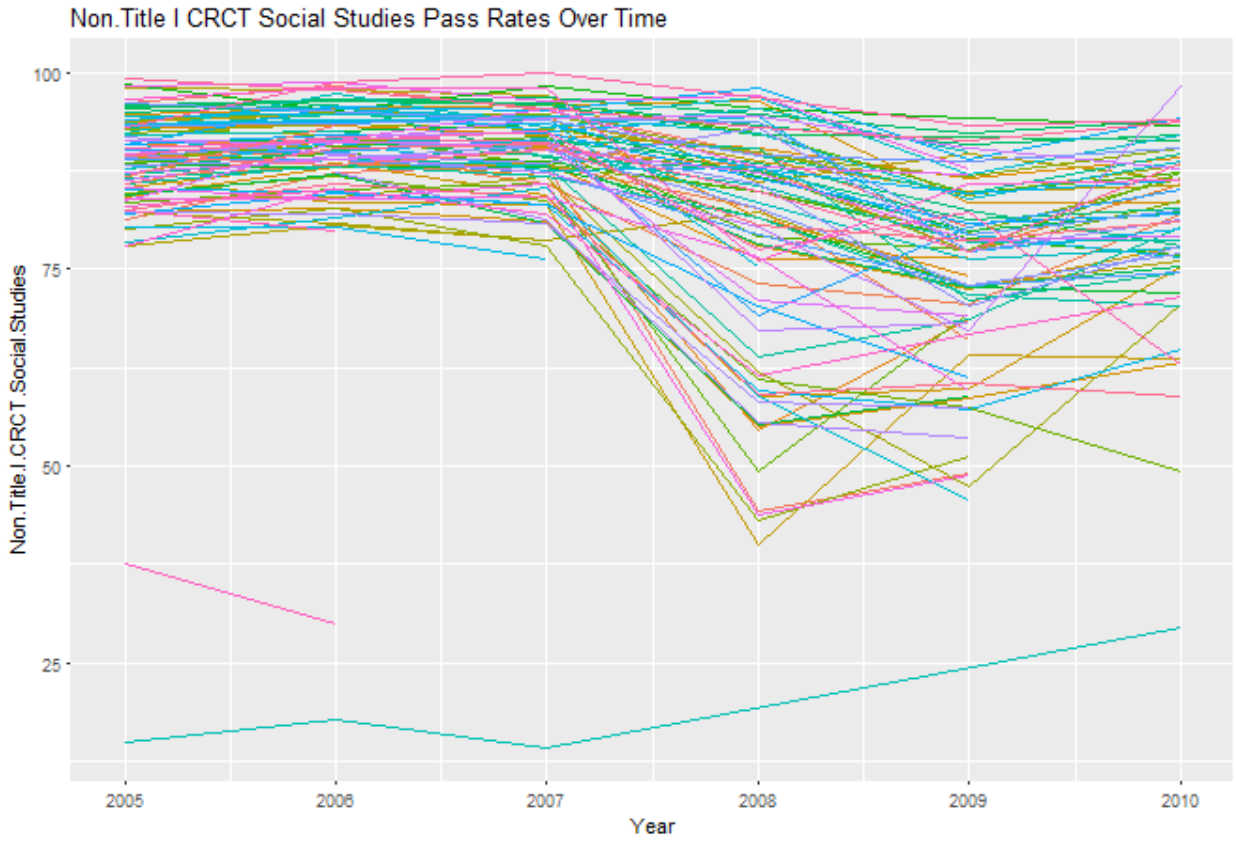

Figure 34: Non-Title I CRCT Social Studies Pass Rates

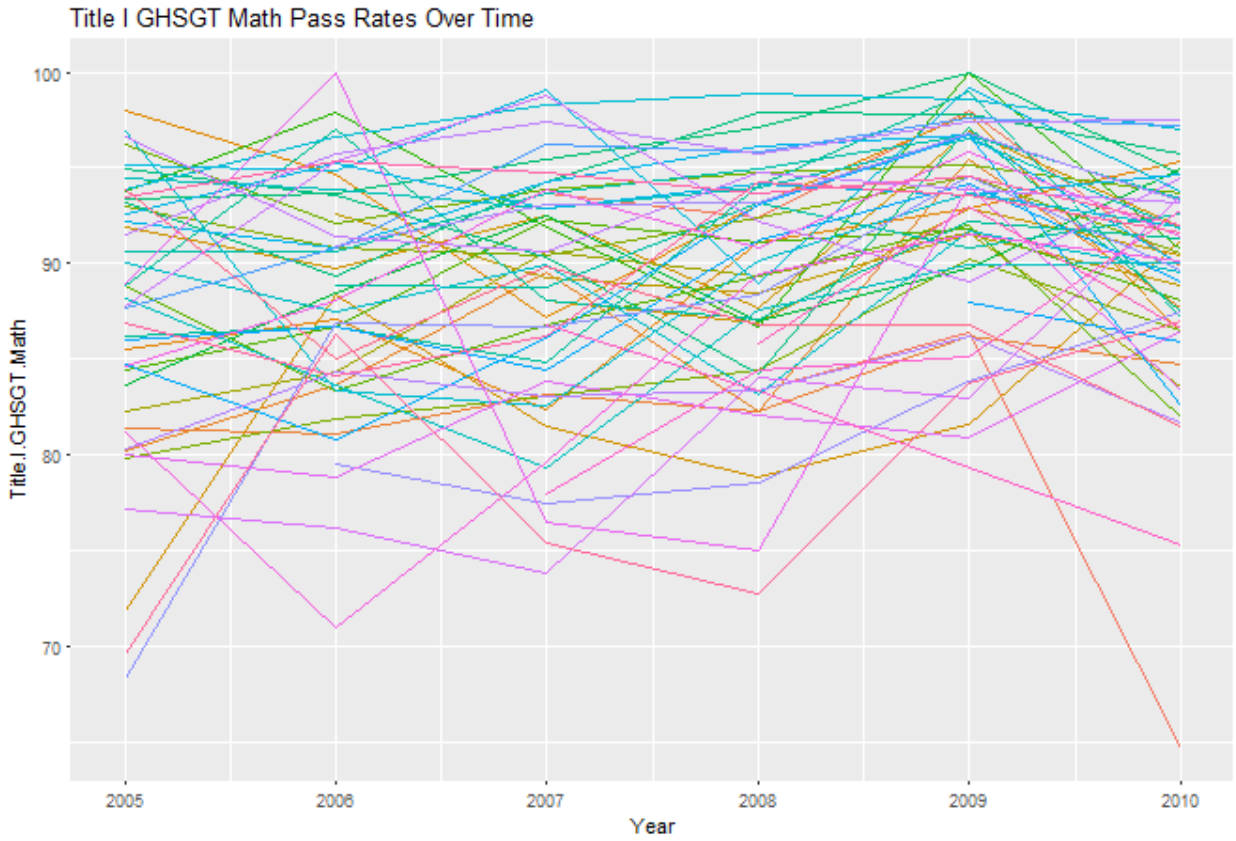

Figure 35: Title I GHSGT Math Pass Rates

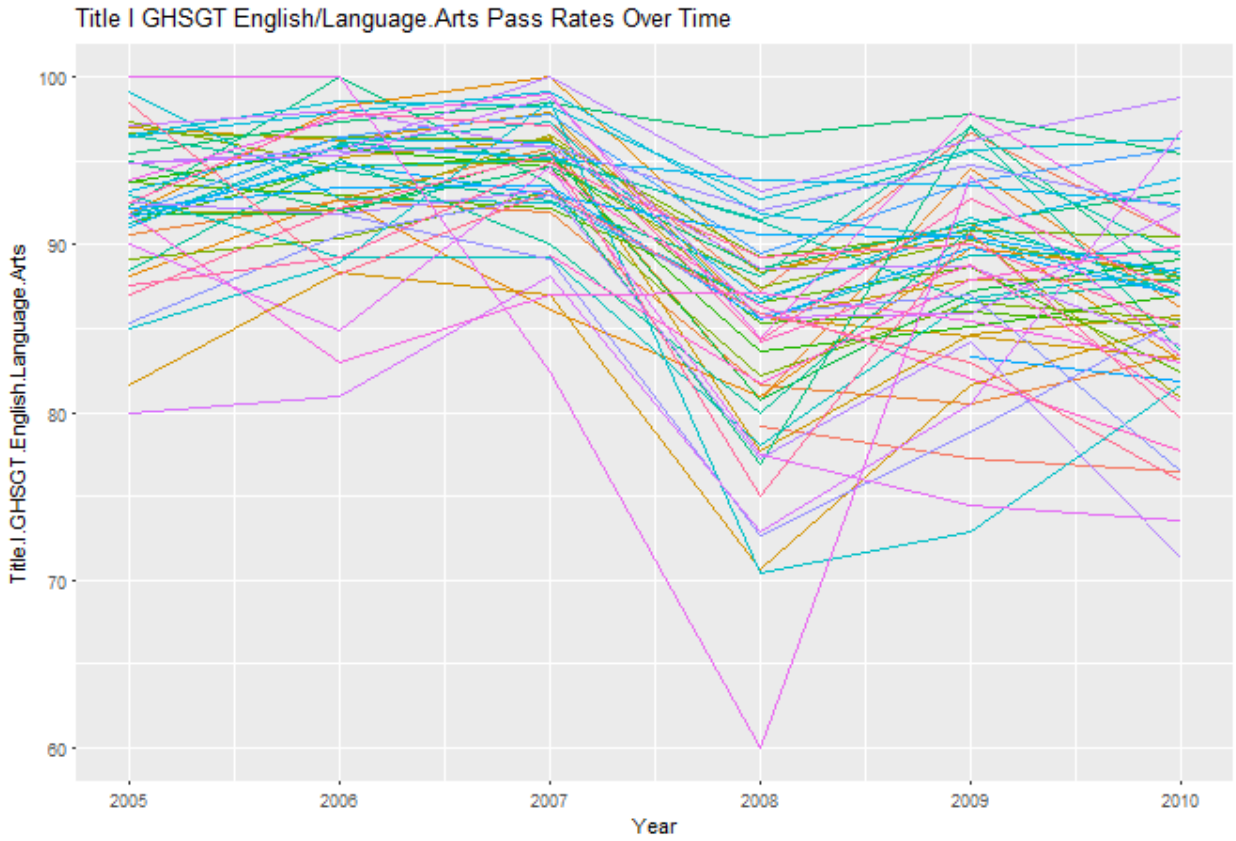

Figure 36: Title I GHSGT English-Language Arts Pass Rates

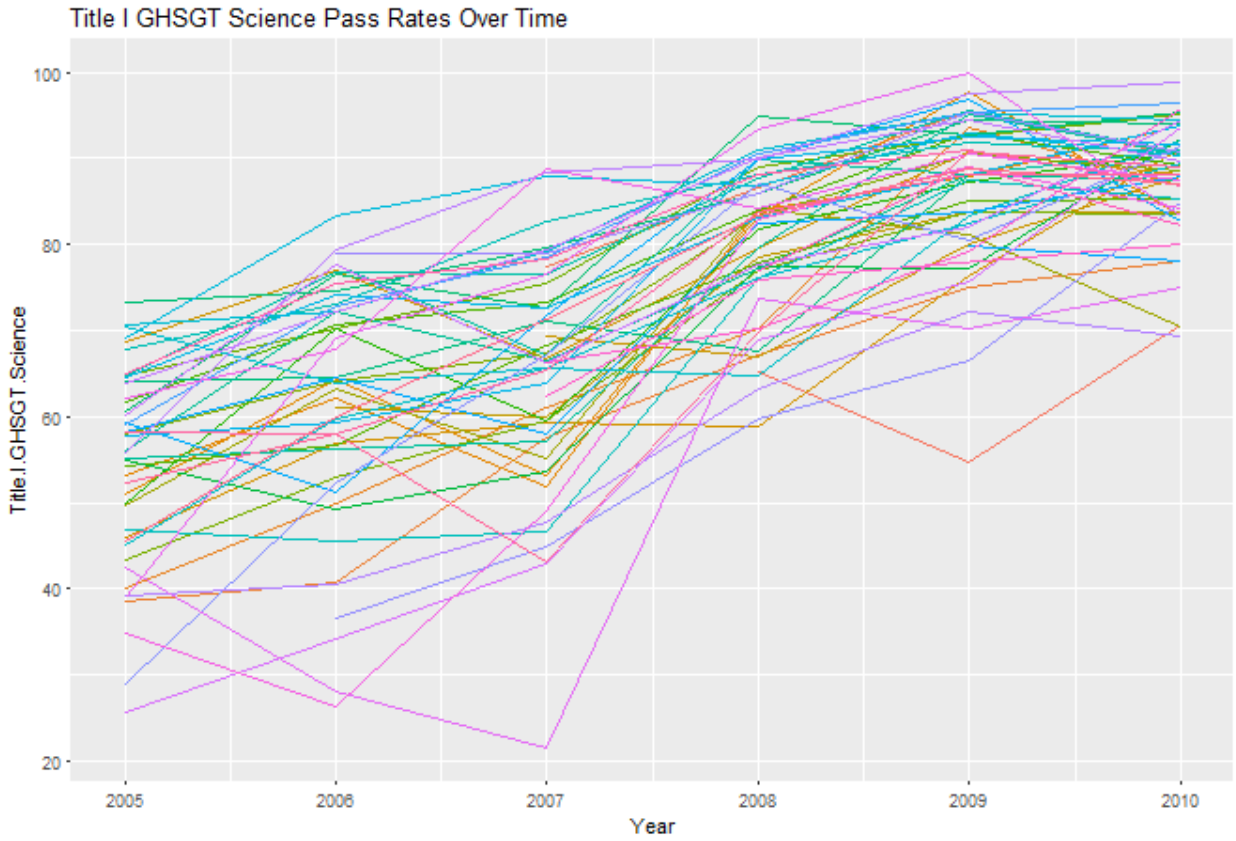

Figure 37: Title I GHSGT Science Pass Rates

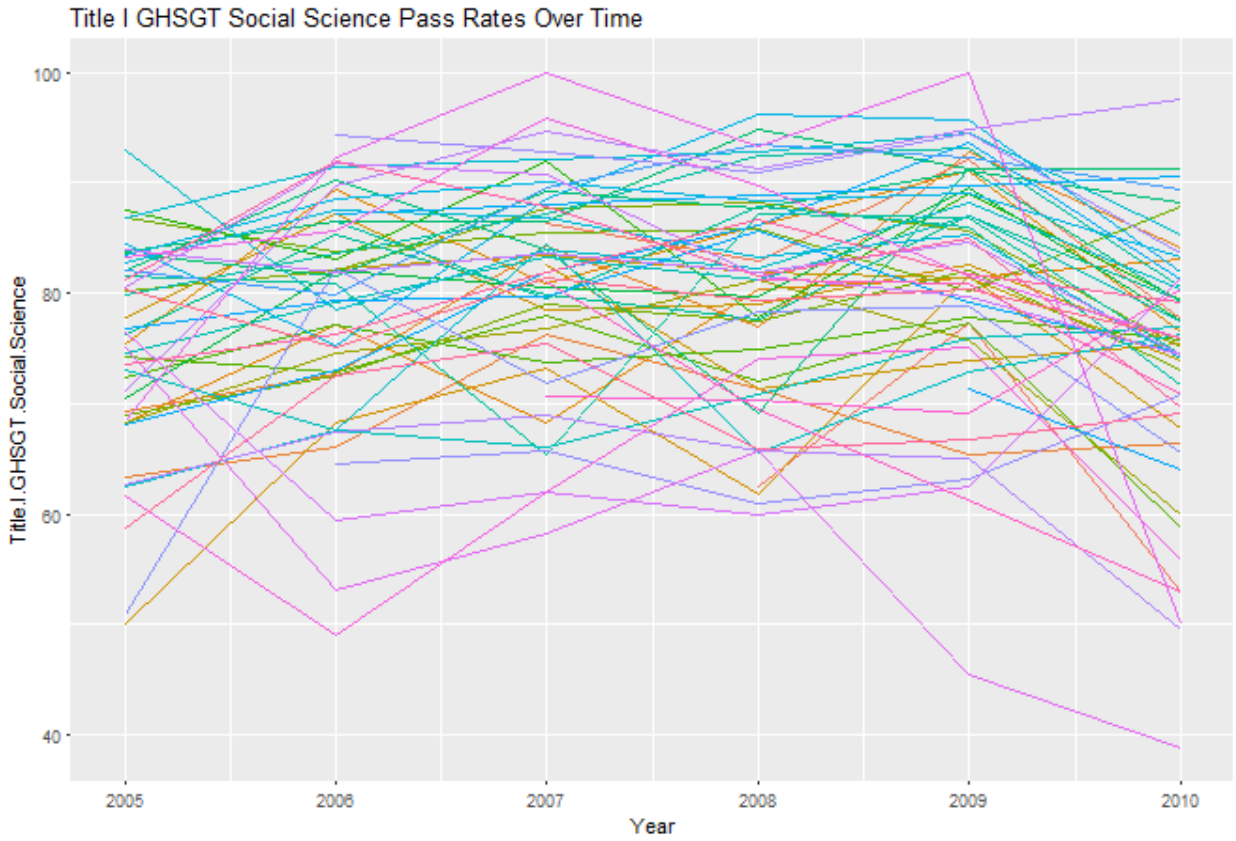

Figure 38: Title I GHSGT Social Science Pass Rates

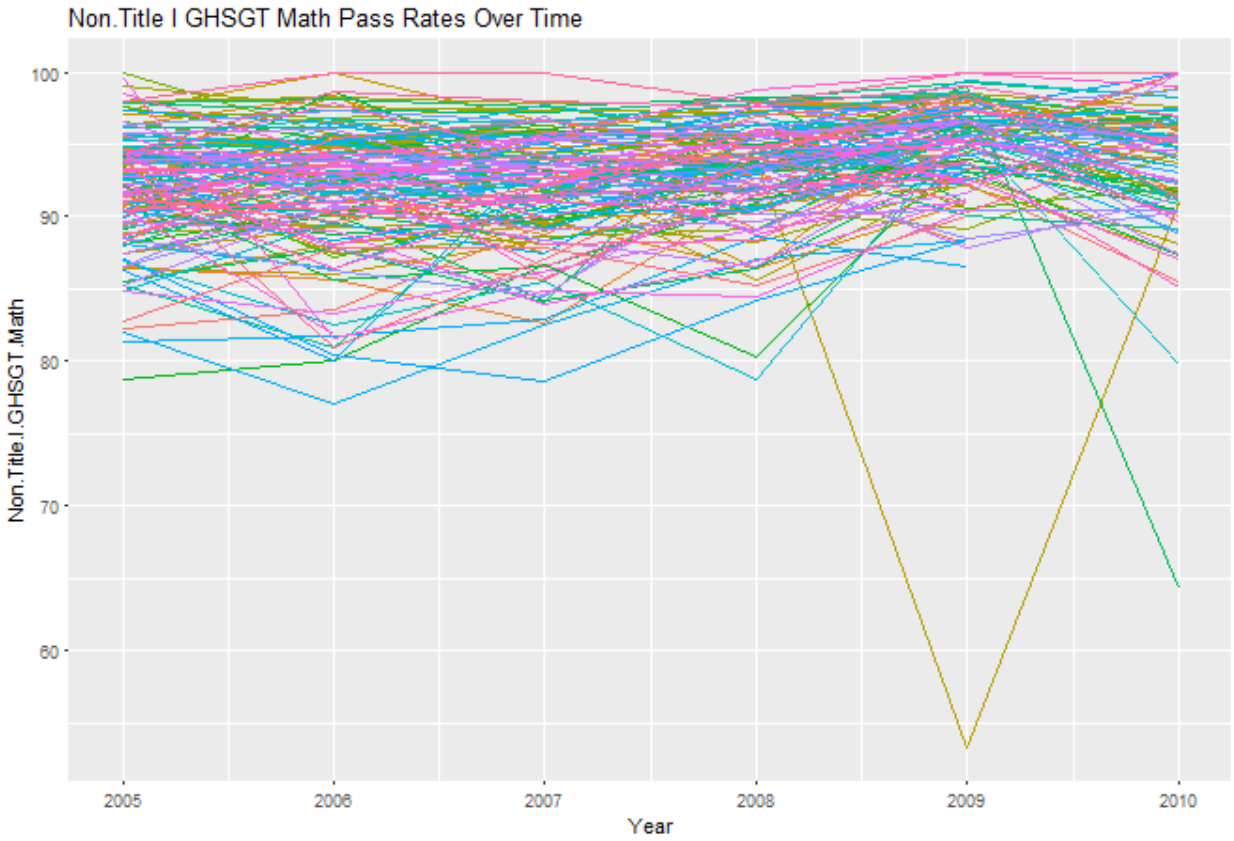

Figure 39: Non-Title I GHSGT Math Pass Rates

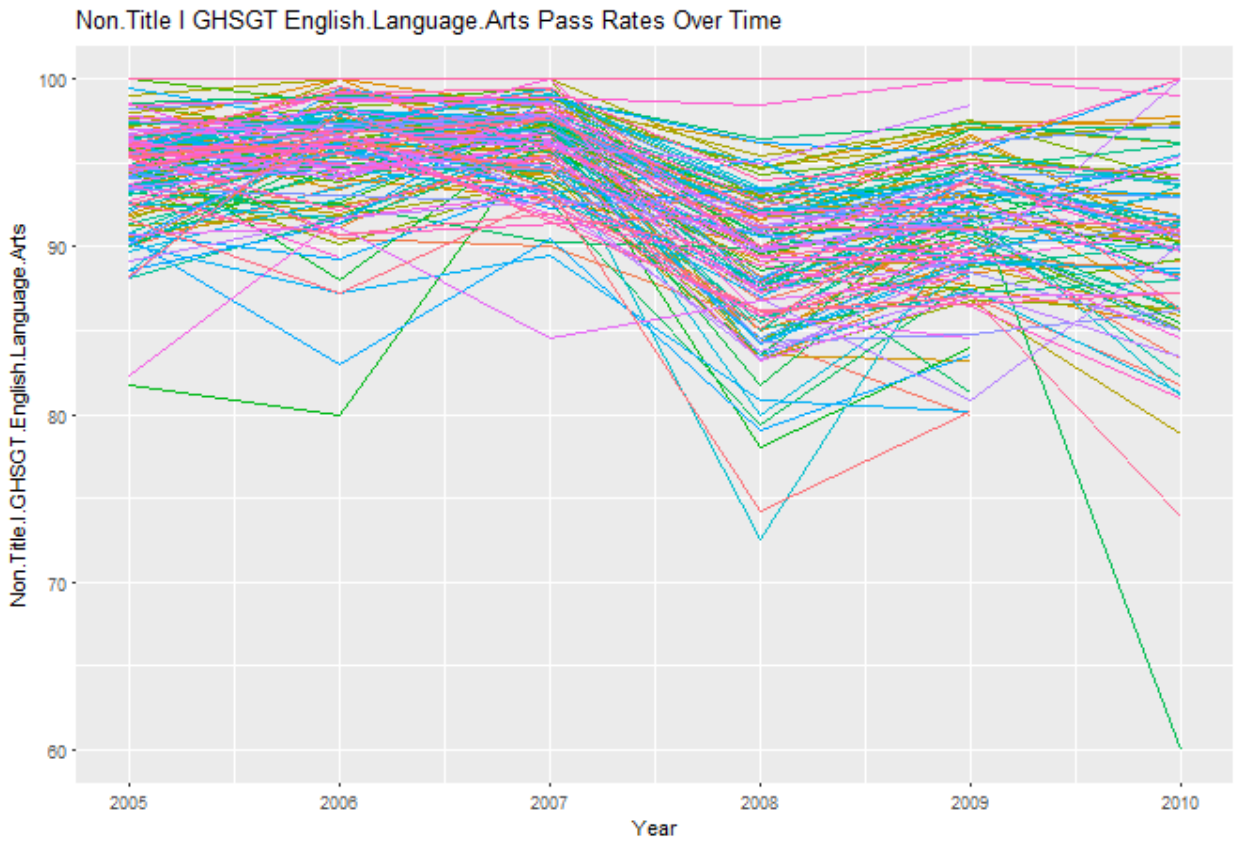

Figure 40: Non-Title I GHSGT English-Language Arts Pass Rates

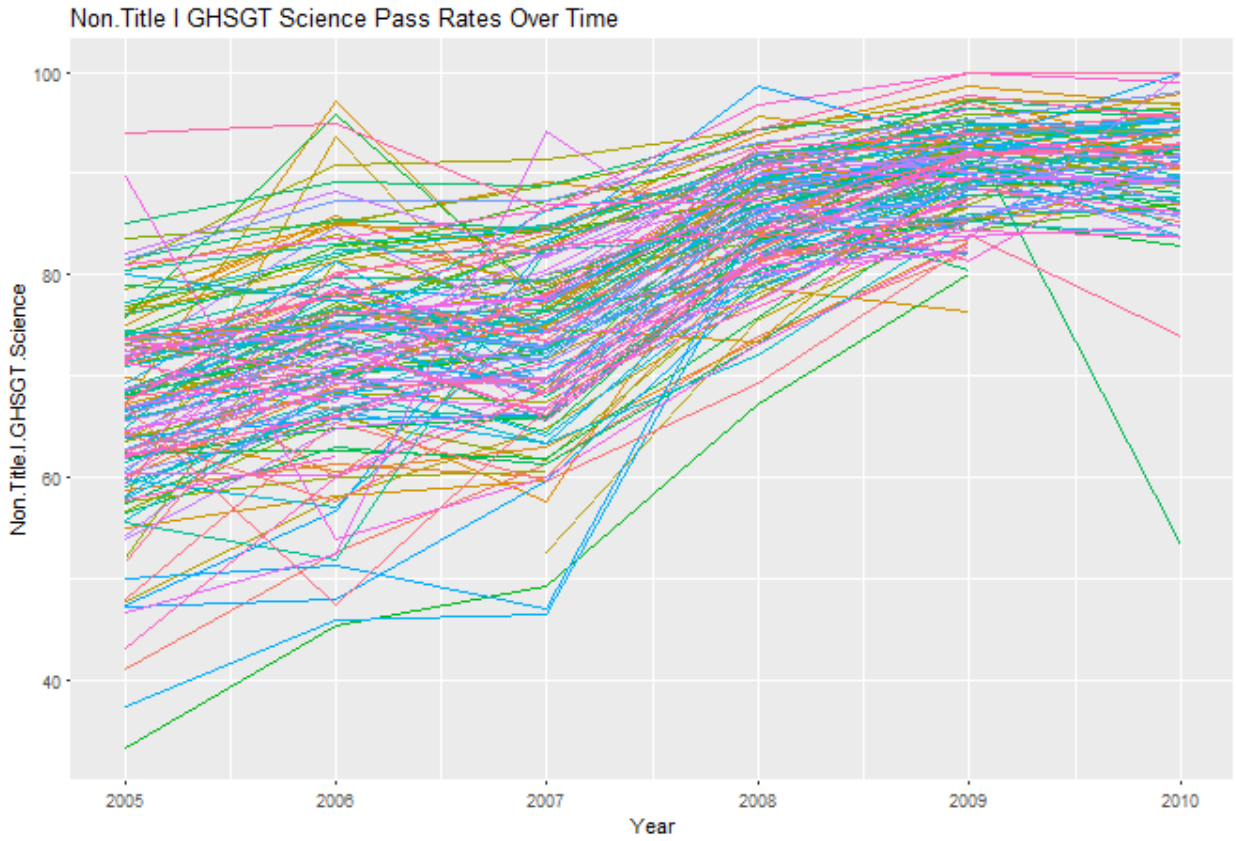

Figure 41: Non-Title I GHSGT Science Pass Rates

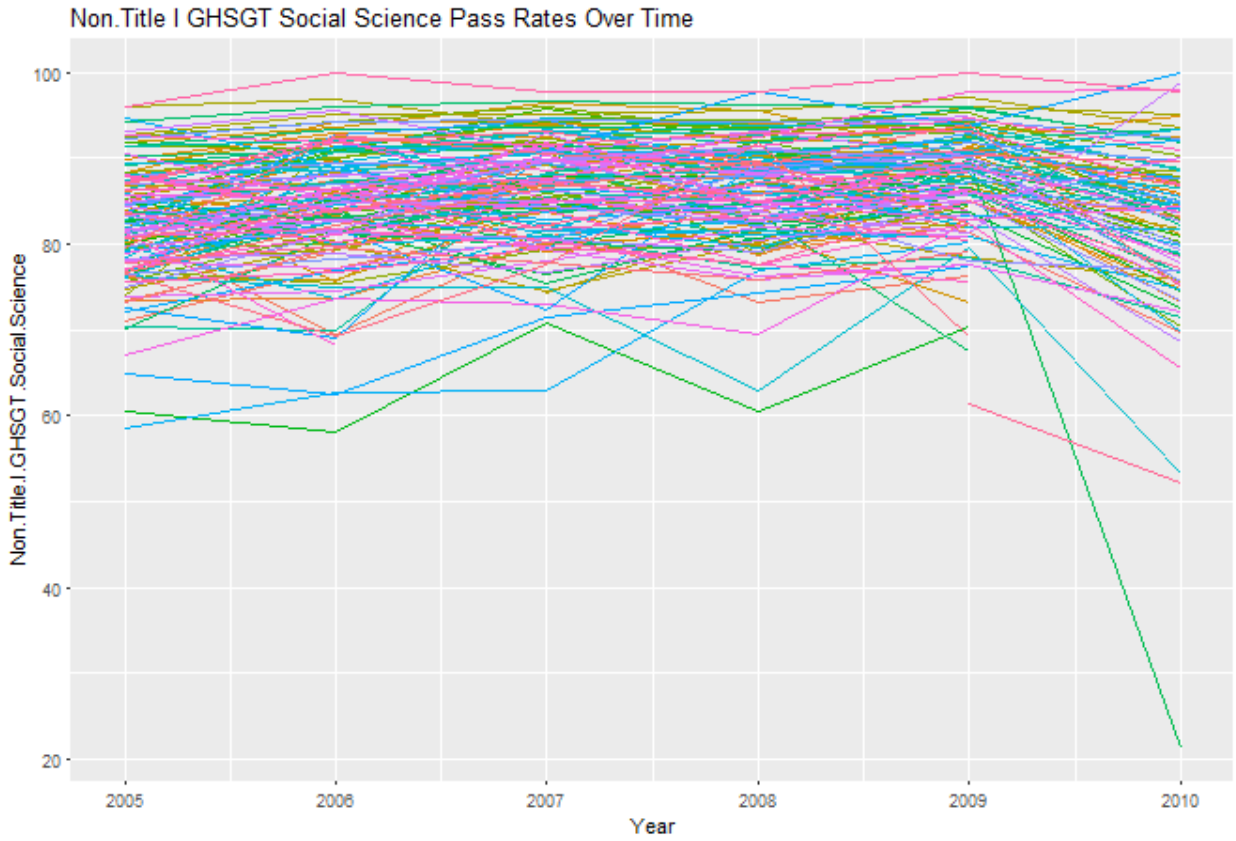

Figure 42: Non-Title I GHSGT Social Science Pass Rates

Title I %

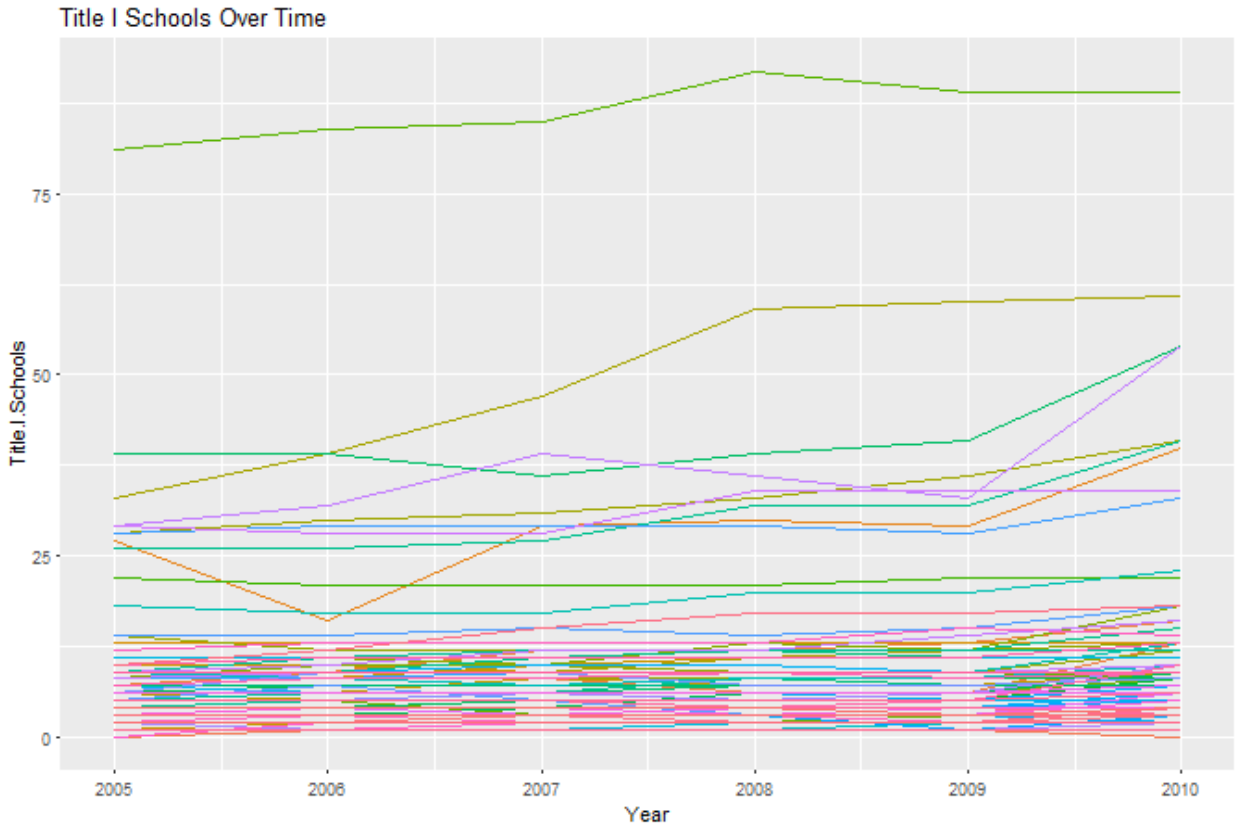

Figure 43: Title I Schools Over Time

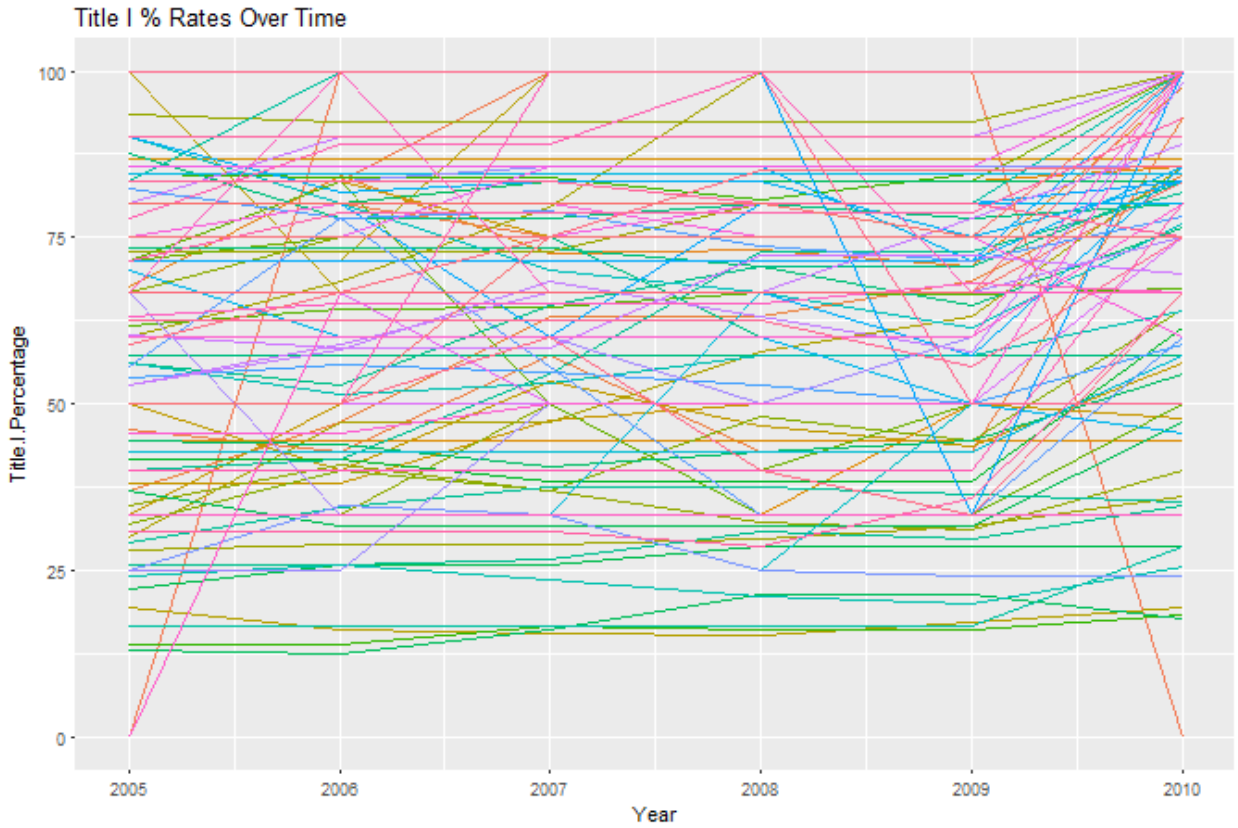

Figure 44: Title I % Over Time