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Is Standards-Based Reform Working? ... and For Whom?

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This paper has not undergone formal review or approval of the faculty of the ILR School. It is intended to make results of Center research available to others interested in preliminary form to encourage discussion and suggestions.

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Abstract

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Three presidents, the National Governors Association, numerous blue ribbon panels and national teachers unions have called for states to develop content standards for core subjects, examinations assessing student achievement aligned with the content standards and accountability mechanisms for insuring that students achieve these standards. In 1999 eighteen states had minimum competency exam (MCE) graduation requirements, 19 rewarded successful schools, 19 had special assistance programs for failing schools, 11 had the power to close down, take over or reconstitute failing schools.

International Evidence on the Effects of External Exams

Proponents of student and school accountability systems sometimes point to the high achievement of students in countries with curriculum-based external exit examination systems (CBEEES) as evidence of the positive effects of external examinations on student achievement. Analysis of data from the Third International Mathematics and Science Study (TIMSS) and International Assessment of Educational Progress indicates that 13-14 year old students from countries with CBEEE systems outperform students from other countries at a comparable level of economic development by **.67 to 2.0** grade level equivalents (GLE) in mathematics, science, geography and reading literacy. Closer to home, students in Canadian provinces with diploma exams were a statistically significant .5 GLE ahead in math and science of comparable students in other provinces (Bishop 1997, 1999; Wößmann, 2000).

The impact of CBEEES on school policies and instructional practices have also been studied. CBEEES are associated with higher minimum standards for becoming a teacher, higher teacher salaries (30-34 percent higher for secondary school teachers) and a greater likelihood of hiring teachers who have majored in the subject they are assigned to teach. Schools in CBEEES jurisdictions equip better science labs, devote more hours to math and science instruction and provide after school tutoring to more students.

Fears that CBEEES have caused the quality of instruction to deteriorate appear to be unfounded. Students in CBEEES jurisdictions were less likely to say that memorization is the way to learn the subject and more likely to do experiments in science class. Quizzes and tests were more common, but in other respects pedagogy was no different. They were no less likely to like the subject and they were more likely to agree that “science is useful in every day life.” Students also talked with their parents more about school work and reported their parents had more positive attitudes about the subject.

What do these positive findings regarding the effects of curriculum-based external exit exams in other countries suggest about the likely success of standards based reform in the United States? While a number of states—Maryland, Virginia, Tennessee and Michigan--appear to be planning to implement a CBEEES, only two states—New York and North Carolina—actually had one during the 1990s. Most states pursuing standards based reform have established test based school accountability systems and minimum competency high school graduation exams that are quite different from CBEEES. Their impacts on teaching, learning and post high school outcomes might be different as well.

Exactly how are domestic student and school accountability strategies similar to or different from the CBEEES that are found abroad? We begin by noting the features they have in common. They

- 1. Produce signals of accomplishment that have real consequences for students and schools.**
- 2. Cover all or almost all students.**
- 3. Define achievement relative to an external standard, not relative to other students in the classroom or the school.** School reputations come to depend more on student success on the external exams and less on parent ability and willingness to pay for an Ivy League education. School reputations can have major consequences for administrators and staff especially when students are able to choose which high school they attend.

4. Assess a major portion of what students are expected to know and be able to do.

Studying to prepare for an exam (whether set by one's own teacher or by a state department of education) should result in the student learning important material and developing valued skills. Some MCEs, CBEEES and teacher exams do a better job of achieving this goal than others. It is, however, not essential that external exams assess every instructional objective. Teachers should be responsible for evaluating dimensions of performance that cannot be reliably assessed by external means.

5. Are controlled by the education authority that establishes the curriculum for and funds K-12 education. Curriculum reform is facilitated because coordinated changes in instruction and exams are feasible. Tests established and mandated by other organizations serve the interests of other masters. America's premier high stakes exams--the SAT-I and the ACT—serve the needs of colleges to sort students by aptitude, not the needs of schools to reward students who have learned what high schools are trying to teach.

Curriculum-based external exit exam systems are distinguished from MCEs by the following additional features. CBEEES:

- 1. Signal multiple levels of achievement in the subject.** If only a pass-fail signal is generated by an exam and passing is necessary to graduate, the standard will almost inevitably be set low enough to allow almost everyone to pass after multiple tries. This will not stimulate the great bulk of students to greater effort. CBEEES signal the student's achievement level in the subject, so all students, not just those at the bottom of the class, have an incentive to study hard to do well on the exam. Consequently, CBEEES should be more likely to improve classroom culture than a MCE.
- 2. Assess more difficult material.** Since CBEEES are supposed to measure and signal the full range of achievement in the subject, they contain more difficult questions and problems. This induces teachers to spend more time on cognitively demanding skills and topics. MCEs, by contrast, are designed to identify which students have failed to surpass a rather low minimum standard, so they do not to ask questions or set problems that

students near that borderline are unlikely to be able to answer or solve. This may result in too much class time being devoted to practicing low level skills.

- 3. Are collections of End-of-Course Exams (EOCE).** Since they assess the content of specific courses, the teacher/s of that course (or course sequence) will inevitably feel responsible for how well their students do on the exam. Grades on EOCEs should be a part of the overall course grade further integrating the external exam into the classroom culture. Alignment between instruction and assessment is maximized and accountability is enhanced. Proponents argue that teachers will not only want to set higher standards, they will find their students more attentive in class and more likely to complete demanding homework assignments. They become coaches helping their team do battle with the state exam.

American Evidence on the Effects of Standard-Based Reform

Improvements in student performance on state exams are often cited as evidence that school accountability initiatives are working. Opponents disagree. Test scores have gone up, they say, because test preparation is displacing the teaching of other skills and knowledge that are more important to success in college and in jobs. This is a testable hypothesis. We tested it by measuring the effects of accountability systems on college enrollment and labor market success after high school of a representative sample of eighth graders in 1988. We also tried to measure impacts on academic achievement; but we employed tests—the NAEP and NELS:88 achievement tests—that are quite different from those used by the state accountability systems being evaluated.

States have introduced different packages of standards based reform initiatives, so we assessed their impacts by comparing outcomes in different states. We studied the impact of one old style reform—state mandated minimum course graduation requirements—and three different SBR policies:

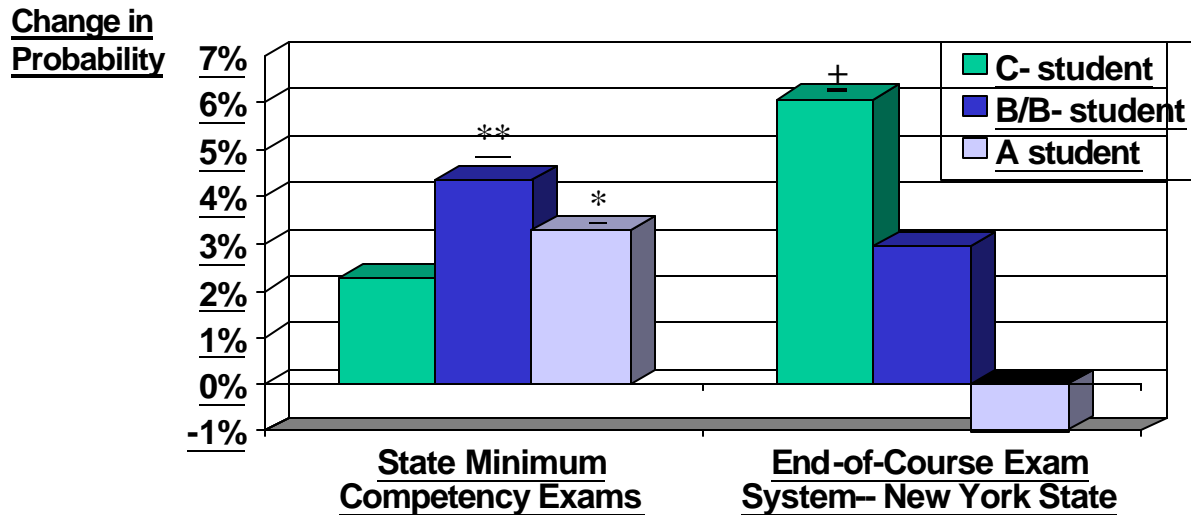
1. Rewards for schools that improve on statewide tests and/or sanctions for failing schools—closure, reconstitution, loss of accreditation etc. [Since few states had implemented these policies prior to 1992, they are not included in our study of 1988 eighth graders]

2. Minimum competency exams
3. Curriculum-Based External Exit Exam System--i.e. the New York/North Carolina stakes for students policy mix during the 1990s.

We present below a summary of the main findings from our two most recent studies of the issue (Bishop, Mane, Bishop and Moriarty 2001, Bishop, Mane and Bishop 2000). The primary data set—NELS:88--provides six years of longitudinal data on 14,000 students who were 8th graders in 1988. Family background is a powerful predictor of high school completion, academic achievement, college attendance and labor market success, so our analyses included controls for a long list of socio-demographic characteristics of the student. We also controlled for the characteristics of the high school and the community—type of private school, teacher salary, pupil-teacher ratio, mean eighth grade test scores, ethnic and socio-economic composition of the student body, local unemployment rates, wage rates and the payoff to and tuition costs of college attendance. The eighth graders who subsequently dropped out of high school were tested and interviewed in 1992 and 1994 and so are included in the analysis sample.

Effects on College Attendance: Estimates of effects on the proportion of 8th graders who subsequently went to college are presented in Figure 1. The **s above a bar indicates that the outcome is significantly greater in MCE states at the 2.5 percent level. A * indicates significantly greater at the 5 percent level. A + above a bar indicates significantly greater at the 10 percent significance level. MCEs significantly increased (by 2.3 to 4.4 percentage points) the percentage of 8th graders who were attending college 6 years later. CBEEES substantially increased college attendance rates of students with low GPAs in 8th grade. College attendance rates of A students were unaffected.

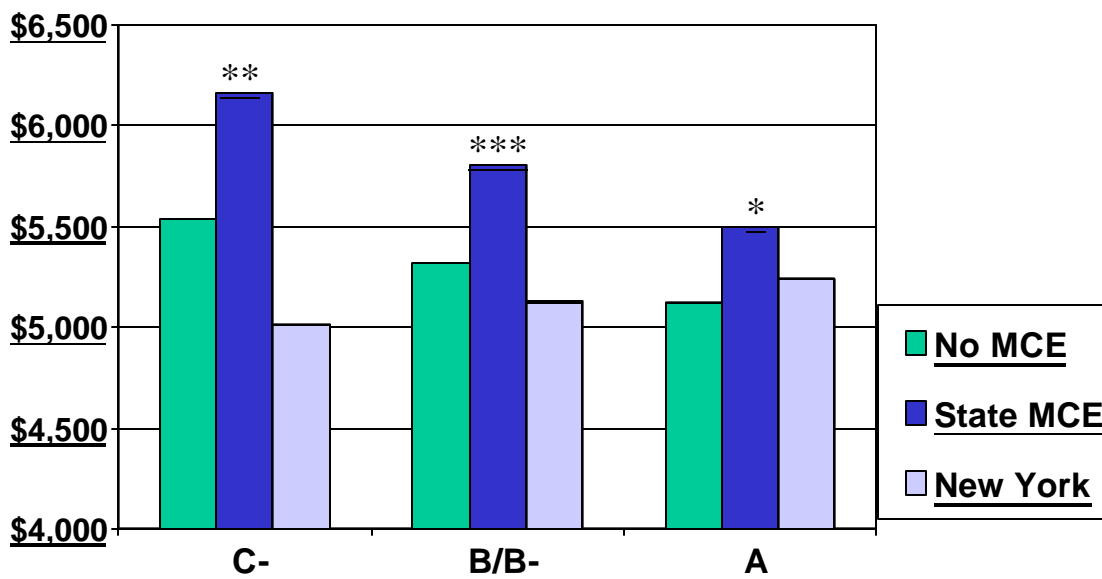
Figure 1 -- "Effects" of State Minimum Competency Exams and End of Course Exams on 8th Graders Attending College 6 years later in 1993/94



Source: Analysis of NELS: 88 data - controls for socio-economic status, GPA & test scores in 8th grade, high school characteristics and state tuition levels and economic conditions.

Effects on Labor Market Success: Estimates of effects of exit exams on annual earnings are presented in Figure 2. Controlling on high school completion and college attendance, students who attended high school in states with MCEs earned significantly more--**9 percent more** in the calendar year following graduation-- than students in states without MCEs.¹

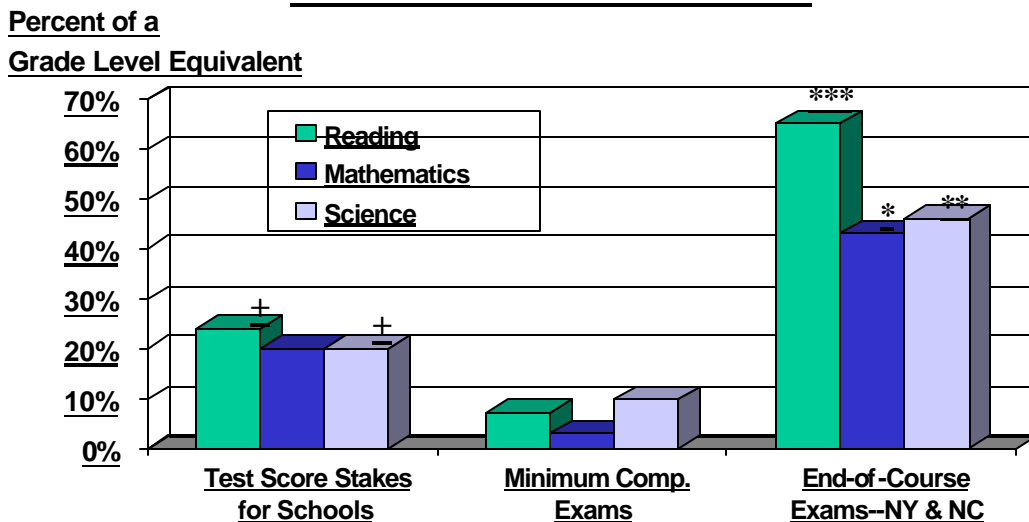
Figure 2 -- Annual Earnings of Workers in 1993 by 8th Grade GPA & State Minimum Competency Exam



Source: Analysis of NELS: 88 data – controls for college attendance, high school completion, socio-economic status, GPA & test scores in 8th grade, state & high school

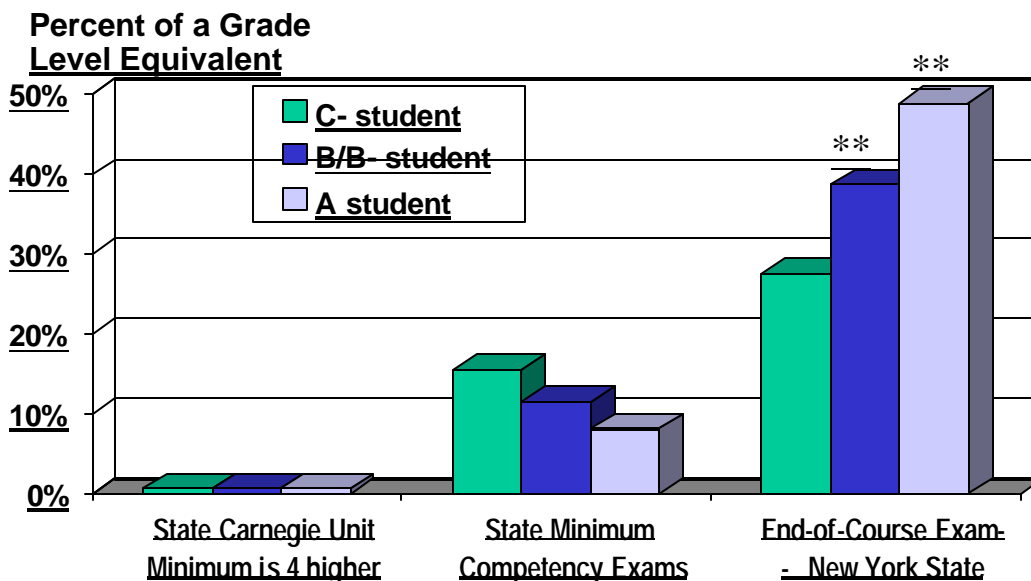
Effects on Test Scores: Our estimates of the effects of state imposed graduation requirements on scores on National Assessment of Educational Progress 8th grade assessments are summarized in Figure 3.² Estimates of the effect of graduation requirements on test score gains from 8th to 12th grade are presented in Figure 4.

Figure 3 -- Effects of Standards-Based Reform Initiatives On NAEP 8th Grade Test Scores



Source: analysis of 1996 & 1998 state NAEP data. Controls included for parent's education, poverty, % Black, % Hispanic and %foreign born. Education Commission of the States was the source of information on state policies.

Figure 4 -- Effects of Graduation Requirements on 8th to 12th Grade Test Score Gains by GPA in 8th Grade



Source: Analysis of NELS: 88 data – controls for attitudes, socio-economic status, GPA & test scores in 8th grade, state & high school characteristics.

The policy that clearly had the biggest effects on test scores was curriculum-based external exit examinations—the combination of EOCEs and MCEs that has been in place in New York State since the early 1980s and in North Carolina since about 1991. In comparison to students in states without MCEs or CBEEES, 8th graders in New York and North Carolina were about 45 percent of a grade level equivalent (GLE) ahead in math and science and 65 percent of a GLE ahead in reading. In addition, test score gains from 8th to 12th grade were nearly 40 percent of a grade level equivalent greater in New York State. This confirms and extends earlier findings that New York students did significantly better on SAT tests and the 1992 8th grade NAEP math tests than other states with demographically similar populations (Bishop, Moriarty and Mane 2000).

The next most powerful intervention was state imposed stakes for teachers and schools particularly when rewards for successful schools were combined with sanctions for failing schools. The bars in Figure 3 depict our estimate of the effect of a state both rewarding schools for success and threatening to sanction failing schools. Students in these states were 20 percent of a GLE ahead in math and science of demographically comparable students in states that did neither. They were 24 percent of a GLE ahead in reading. Public reporting of school level results on state tests is necessary for the implementation of these policies, but on its own it had no discernable effect on student achievement.

When other SBR policies were held constant, the positive effects of state imposed MCEs on achievement were small and statistically insignificant. While state imposed MCEs had no significant effects on learning gains of students with average or above average grades in 8th grade, students with low GPAs learned more math and science when they lived in MCE states.

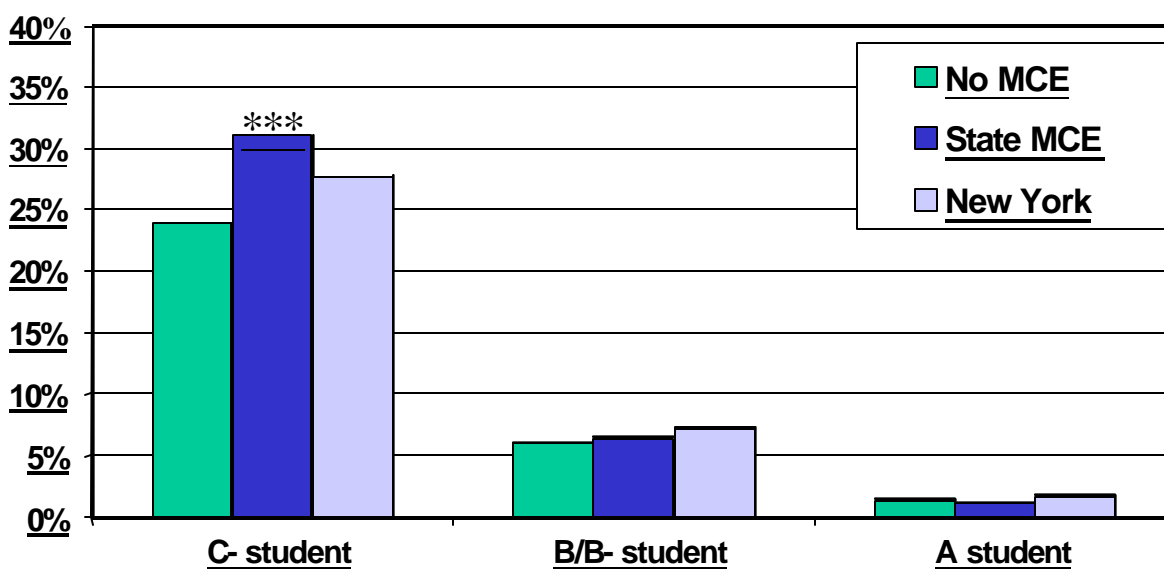
The policy having the smallest effects was state imposed course graduation requirements. They had no effects on test score gains during high school.

Whose predictions were correct? Our analysis of college attendance rates, labor market success and test scores overwhelmingly rejects the hypotheses that test based accountability systems hurt students by inducing teachers to teach to severely flawed tests.

Indeed the estimated impacts of test-based accountability policies on indicators of success after high school are positive, not negative as predicted by SBR critics. Indeed, it is the predictions of SBR supporters—that student and school accountability policies help students get better jobs and stay in college longer—that receive strong support. In addition, scores on tests that are not part of state accountability systems are higher in states with strong SBR policies. Thus, most students benefit from SBR policies. There are, however, some who lose out--those who would have graduated under the old rules but do not graduate because they cannot pass the tests. How large are these effects?

Effects on High School Graduation Rates: Our analysis of longitudinal data is presented in Figure 5. We found that the graduation rates of students with average or above average grades in 8th grade were not affected by state MCEs. However, students with C- grades in 8th grade were significantly (7.7 percentage points) less likely to get a high school diploma or a GED within 6 years when they lived in a MCE state. Graduation rates of students living in New York were no different from the graduation rates in states without MCEs.

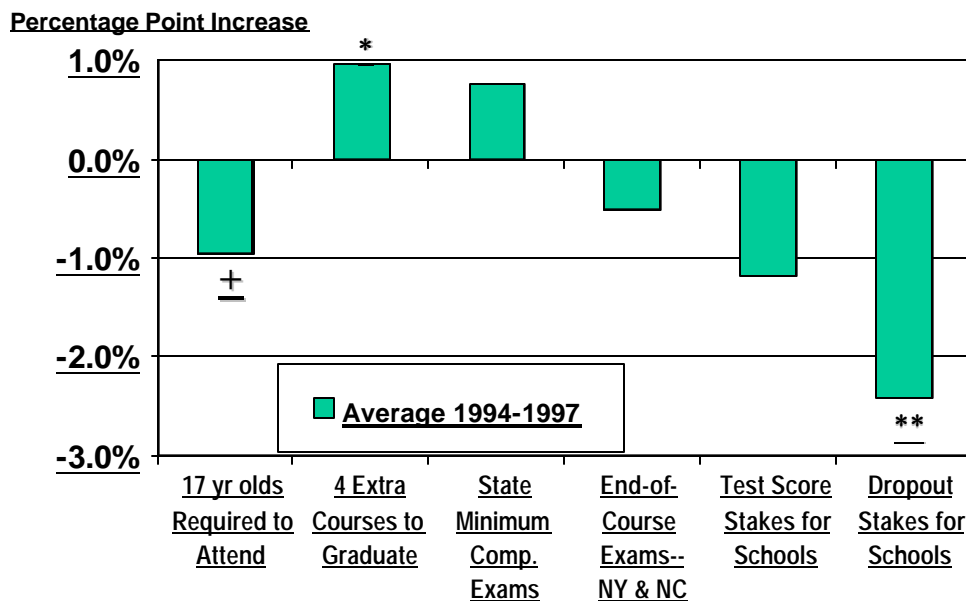
Figure 5 – Probability of Not Getting a Diploma or GED by 8th Grade GPA & State Minimum Competency Exam



Source: Analysis of NELS: 88 data – controls for attitudes, socio-economic status, GPA & test scores in 8th grade, state & high school characteristics.

Effects on Dropout Rates: Figure 6 summarizes the analysis of 1994-97 state data on the dropout rates reported by public high schools. States with higher course graduation requirements had significantly higher dropout rates. States with laws requiring 17 year olds to attend school had significantly lower dropout rates. Dropout rates were also significantly lower when the criteria by which schools were held accountable included dropout rates or graduation rates (see right hand side of Figure 6). Holding schools accountable for student test scores was not associated with higher dropout rates and indeed tended to be associated with lower dropout rates. These effects are additive, so the regression predicts that state programs that reward and sanction schools based on both test scores and dropout rates have dropout rates that are 3.1 percentage points lower. Our estimates imply that well designed ‘stakes for schools’ system that includes dropout rates in the accountability system more than offset the tendency of MCEs and CBEEES to increase dropout rates. We cannot be sure, however, that these findings are not caused by school administrators gaming the system that reports dropout rates so more research is needed on the topic.

Figure 6 -- Effects’ of State Policies on Annual Dropout Rates of Public High Schools



Analysis of event dropout rates of 41 states from Common Core Data. Controls included for parent’s education, poverty, %Black, %Hispanic and %foreign born. Education Commission of the States was the source of information on state policies.

Policy Implications: Grissmer et al (2000) found that the biggest gains in NAEP mathematics scores were in North Carolina and Texas—the two states that established the nation’s most comprehensive systems of school and student accountability in the early 1990s. Our analyses confirm this finding. States that reward schools for success and sanction schools that are failing had significantly higher achievement levels. We also found that they had lower dropout rates. What are the effects of student accountability schemes?

State MCE graduation requirements had both positive and negative effects on students. While students with average or above average grades were unaffected, students with low grades in 8th grade were less likely to graduate during the next six years. The effects of MCEs on achievement in 8th grade and test scores gains during high school were small and often not statistically significant. On the other hand, students with both high and low grades were significantly (about 2 to 4 percentage points) more likely to attend college in 1993/94 when they lived in a MCE state. In addition, employers responded to the enhanced reputation of recent high school graduates by paying them 9 percent more.

Curriculum-based external exit exam systems had by far the largest impacts on test scores. On the negative side, New York students of the early 1990s were more likely to get GEDs and tended to take longer to get their diploma. They were not, however, less likely to graduate and low GPA students were significantly more likely to go to college. Achievement levels at the end of high school were roughly one grade level equivalent ahead of comparable states. These are the effects of a voluntary moderate stakes end-of-course examination system, not the compulsory high stakes exam system now being phased in. States that are reluctant to implement a high stakes high school graduation test might want to look at the old Regents exam system as a possible model for a moderate stakes student accountability system.

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Endnotes

¹ One can also see in figure 2 that in most of the United States students with A averages do not get better jobs immediately after high school than C students. In fact when one holds college attendance constant, they tend to earn considerably less. Because Regents exam scores are part of student grades and appear on high school transcripts (thus signaling who is taking a more rigorous curriculum), we checked to see whether rewards for academic achievement were greater in New York State than elsewhere in the nation. This hypothesis was confirmed.

² The cross section analysis of state data on NAEP test scores and dropout rates included controls for the percent of children living in poverty, parental education, percent foreign born, the percent of public school students who are African-American and the percent who are Hispanic.