

DATE: March 4, 2015
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SUBJECT: PROJECTED BENEFITS OF 90% BENCHMARK ATTAINMENT IN 3RD GRADE READING

Introduction

This brief memorandum describes our estimates of selected benefits that would flow from ensuring that 90% of Oregon's 3rd grade students read at grade level. Specifically, we estimate the improvements in grade retention, on-time high school graduation, and earnings through age 28 that would accrue to Oregon's 2013-14 class of 3rd graders, had 90% reached the state reading benchmark on the OAKS (compared to actual benchmark attainment of 68%, a 22 percentage point gap). Thus, the projected benefits reflect improvements for a single cohort of students. Maintaining similar gains over time would multiply the total benefits accruing to the state's K-12 system and students.

The findings presented below require two caveats. First, we rely primarily on observed *correlations* between 3rd grade reading performance and subsequent academic outcomes. Specifically, we examine the academic trajectory of Oregon's 2003-04 3rd grade class (on-time graduation in 2012-13). Even if Oregon successfully improves 3rd grade reading, the nature of the specific interventions implemented to do so will affect the realized long-term benefits. For example, devoting additional, large blocks of time to test-specific preparation may increase benchmark attainment rates, but may not produce the anticipated long-term benefits, which likely result from much more than test-taking ability.

Second, we examine a only small subset of potential benefits. Significantly improving 3rd grade reading would likely benefit students and the system in ways not directly captured by these outcomes. For example, improved 3rd grade reading could reduce the need for remedial education in later grades, or produce other systemic improvements (e.g., improvements in the K-3 grade reading curriculum might also apply to later grades and thereby produce additional long-term benefits).

Summary of findings

We present findings for two scenarios described in more detail below. Scenario 1 incorporates more conservative assumptions; Scenario 2 incorporates more optimistic assumptions.

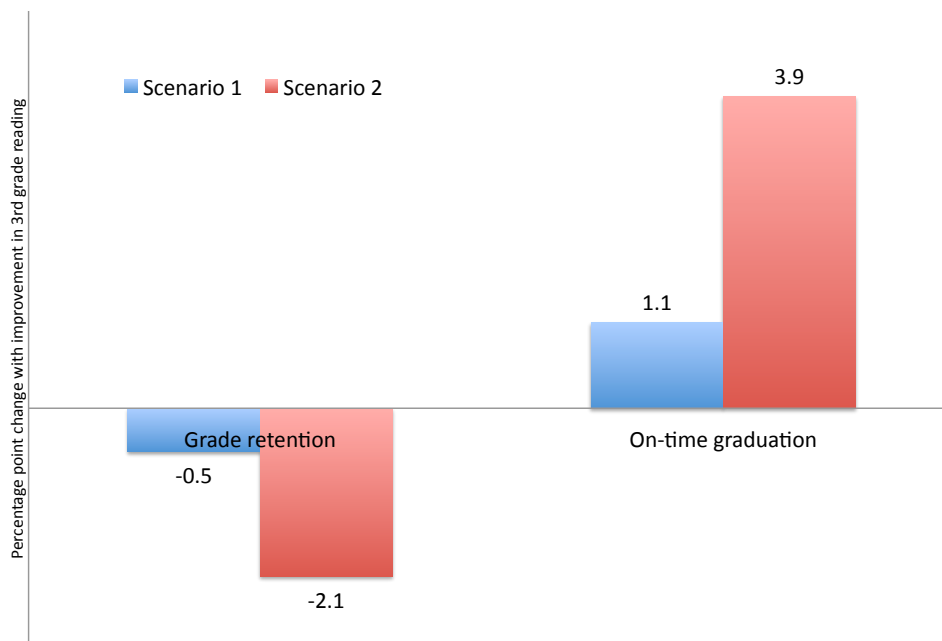
- **Grade retention:** We find that 90% benchmark attainment in 3rd grade reading would have reduced the share of students in the cohort that repeated at least one grade by between 0.5 percentage points (Scenario 1) and 2.1 percentage points (Scenario 2). For comparison, 12 percent of the 2003-04 3rd grade cohort repeated at least one grade by

2012-13. Thus, the improvements resulting from 90% benchmark attainment in 3rd grade represents a reduction in grade retention of between 4 and 18 percent.¹

- **On-time graduation:** We find that 90% benchmark attainment in 3rd grade reading would have increased on-time graduation rate by between 1.1 percentage points (Scenario 1) and 3.9 percentage points (Scenario 2).
- **Earnings through age 28:** We find that 90% benchmark attainment in 3rd grade reading would increase the present value of lifetime earnings for the cohort by between \$34.4 million (Scenario 1) and \$154.5 million (Scenario 2) in 2014 dollars. This translates to between \$831 and \$3,731 for each student in the cohort or, alternatively, between \$3,735 and \$16,776 per student meeting benchmark that would not have without the modeled improvements.

The following charts illustrate these findings.

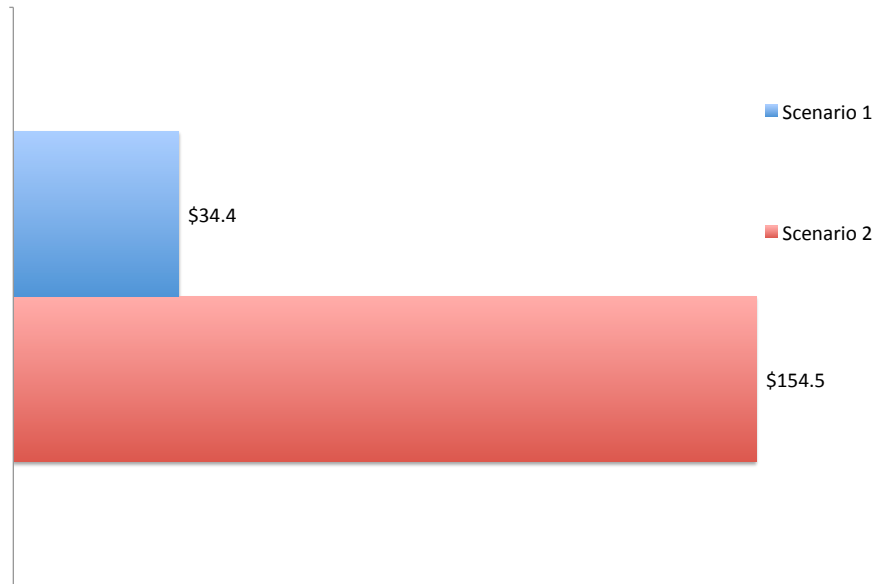
Figure 1: Improvement in grade retention (3rd-12th grade) and on-time graduation



Source: ECONorthwest analysis/ODE data.

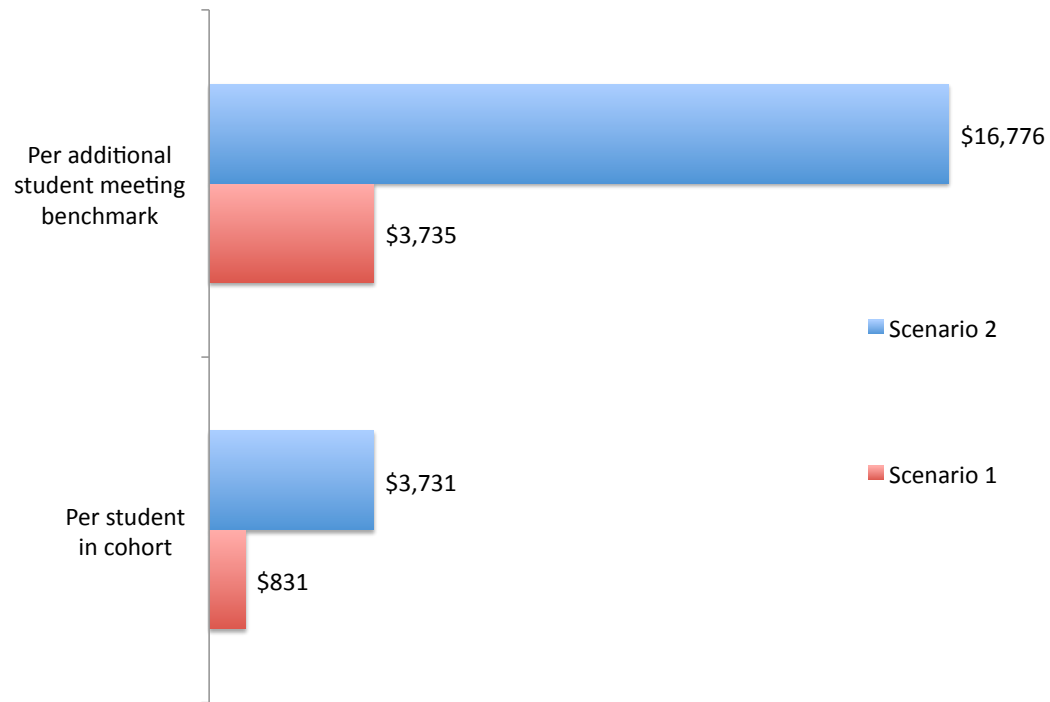
¹ Based on per-student spending, we estimate that the reduction in grade retention could free between \$1.5 million and \$7.8 million annually if all enrolled cohorts had improved by a similar amount in 3rd grade.

Figure 2: Increase in present value of total cohort earnings through age 28 (millions of 2014 \$)



Source: ECONorthwest analysis/ODE data.

Figure 3: Per-student increase in present value of total cohort earnings through age 28 (millions of 2014 \$)



Source: ECONorthwest analysis/ODE data.

Summary of methods

To calculate the benefits of improved 3rd grade reading, we proceed in three steps:

1. First, we estimate the relationship between 3rd grade OAKS reading performance and the outcomes of interest, controlling for student eligibility for free or reduced-price lunch.²
2. Next, we use model results from (1) to predict outcomes for the 3rd grade class of 2013-14 under the status quo (actual reading performance), and under two improvement scenarios.
3. To predict earnings benefits through age 28, we apply research findings that link differences in teacher quality to long-term outcomes, including earnings.³

We define the two scenarios as follows:

- **Scenario 1:** We assume that reading RIT scores for students that actually met the 3rd grade benchmark do not change. We assume that scores improve for the 22 percent of the cohort closest to achieving the benchmark just enough for these students to reach the cut point. For these students, this corresponds to an improvement of about 0.5 standard deviations. Across the full cohort, the improvements produce an average increase in performance of 0.1 standard deviations.
- **Scenario 2:** We assume that reading RIT scores improve for all students by an amount equal to the average improvement of the 22 percent with higher scores in Scenario 1. Thus, performance improves by about 0.5 standard deviations across the full cohort.

² Specifically, we use data on 3rd grade OAKS reading scores, grade progression, and 2012-13 high school completion for the 3rd grade class of 2003-04 to estimate probit models where the dependent variable is one of the two outcome measures (repeated a grade by 2012-13; graduated in 2012-13) and the independent variables include FRL eligibility and a polynomial in reading RIT score.

³ We rely on results presented in results in Chetty, Friedman, and Rockoff (2014), "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood," *American Economic Review*. The Chetty, et al research links differences in teacher value-added to long-term outcomes. In this analysis, we assume achieving 90% benchmark attainment is equivalent to having teachers with value-added sufficiently higher to reach 90%.