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Three Essays in the Economics of Education: Dissertation Summary

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This dissertation consists of three self-contained chapters investigating current issues in the economics of education. The first chapter investigates the effects of school closing policies on student achievement by examining over 200 school closings in Michigan. Many school districts across the country are shutting schools, but school closing policies remain a very controversial issue. Relative to the previous literature, the analysis uses a broader set of school closings to thoroughly investigate heterogeneity in treatment effects based on the performance level of the closed school. The results indicate that, on average, school closings in Michigan did no persistent harm to the achievement of displaced students, and students displaced from relatively low-performing schools experience achievement gains. However, the displacement of students and teachers creates modest negative spillover effects on the receiving schools. Hence, the closing of low-performing schools may generate some achievement gains for displaced students, but not without imposing spillover effects on a large number of students in receiving schools.

The second chapter examines the effects of a shortened school year policy on student achievement. Changing the length of the school year has dramatic potential effects for student achievement, but the magnitude of these effects will depend on the extent to which parents and teachers respond to the policy change. This study examines student achievement in public schools in Hawaii, which furloughed teachers on 17 Fridays during the 2009–2010 school year. This policy was well-publicized in advance, allowing time for parents and teachers to adjust their behavior. Using multiple specifications and identification strategies, the study finds negative effects from the school furlough policy on student achievement in elementary school, but no effects on achievement in middle and high school.

The final chapter, coauthored with Seth Gershenson and Michael Hayes, looks at teacher grade reassignments in elementary schools. While recent research suggests that grade-level reassignments play an important role in fostering student achievement, the literature on teacher turnover and attrition has largely ignored the reassignment of teachers within schools. We seek to fill this gap using teacher-level micro data from Michigan to document the prevalence and distribution of grade-level reassignments across different types of schools and teachers. We find that inexperienced teachers and teachers who are new to their school are more likely to switch grades. The results also suggest that the disruptions associated with within-school teaching reassignments are inequitably distributed across schools and

students. Urban schools, schools with higher attrition rates, and schools with higher concentrations of minorities have significantly higher rates of grade switching.

Chapter 1

The Effect of School Closings on Student Achievement

Over 1,800 public schools were shut in the United States after the 2008–2009 academic year alone (Common Core of Data 2011). School closings have become common nationwide, and urban centers such as Chicago, Detroit, Kansas City, New Orleans, Oakland, Philadelphia, and Pittsburgh have all recently closed schools. In addition, as policy discussions increasingly focus on high-stakes accountability, some policymakers have suggested shutting the lowest-performing schools and shifting students to higher-performing schools as a way to increase student achievement. However, community leaders and teachers' unions often vehemently oppose these school closings. In fact, during the recent teachers' strike in Chicago, the president of the Chicago Teachers Union described the district's desire to shut schools with excess capacity as the "big elephant in the room" (Lah and Botelho 2012). Given this controversy, understanding how school closings influence student achievement is essential for policymakers, because the extent to which districts should utilize closing policies depends crucially on the effect of closings on student achievement.

Theoretically, the effect of shutting schools on student achievement is ambiguous. On one hand, school closings may cause harm to students because they disrupt peer and teacher networks, which may affect the displaced students who are forced to change schools, as well as students at the receiving schools who experience an influx of new students and teachers. On the other hand, being displaced from low-performing schools may expose students to higher-quality peer groups and teachers, generating achievement gains. Hence, if students are systematically moved to higher-quality schools, the net effect of the displacement could very well be positive. Which of these effects dominates and under what circumstances is an open empirical question.

This chapter provides evidence on the nature of these effects by examining school closings in Michigan, a state that provides an excellent setting for examining school closings because a large number of schools have shut in the past decade. Using statewide student-level micro data to follow students after displacement, the study estimates the effects of school closings on both displaced students and students in nearby receiving schools. Because schools may be selected to close on the basis of their past test scores, the analysis examines the achievement trajectories of these schools prior to closure. By documenting the magnitude of the dip in test scores prior to closure, the analysis generates plausi-

ble bounds on the effect of closing schools. This bounding approach does not deliver point-identified estimates, but generates policy-relevant conclusions while relying on less restrictive assumptions than an approach that attempted to match closed schools to a control group of schools on the basis of past test scores. In addition, the current study examines a wide range of school closings and hence is better able than prior studies to estimate heterogeneous effects based on the performance level of the closed school. Identifying this heterogeneity is key for extrapolating these results to other settings. In particular, understanding whether districts should adopt policies of closing particularly low-performing schools will depend on the effects that closing low-performing schools generates on the achievement of both displaced students and students in the receiving schools.

The results indicate that school closings in Michigan did no persistent harm to the achievement of displaced students. For reading, students experienced no significant change in test scores at the time of displacement. For mathematics, students in closed schools were falling behind their peers in the district prior to closure, and this dip prior to displacement was not the result of formal school closing announcements. Student achievement in mathematics remained low in the first year in their new school, but improved markedly thereafter. In the second year following displacement, student test scores in mathematics were substantially higher than they were in the year prior to being displaced. This result suggests plausible bounds on the effect of school closings on student achievement. If the drop in test scores prior to closure is driven by a multiple period transitory shock, then the results indicate no long-term effect of school closings on student achievement. If instead the drop prior to closing represents a declining trend in student achievement at the closed school, displacement has a positive impact on mathematics achievement for displaced students. In either case, school closings create modest negative spillover effects onto students in receiving schools, which persist for multiple years. All of these results are robust to controlling for districtwide time trends and selective mobility of students out of schools prior to closure.

Intuitively, the effect of displacement varies based on the performance level of the closed school. In mathematics, students displaced from relatively low-performing schools experience gains in achievement compared to their prior performance at the closed school. In addition, the estimated effects on receiving schools vary with respect to the performance level of the closed schools. If students are displaced from relatively low-performing schools, the spillover effects are larger in magnitude.

These results imply that districts forced to close schools due to changing demographics or financial problems do no persistent harm to the achievement of displaced students, and the spillover effects onto students in receiving schools are modest in magnitude. In addition, displaced students expe-

rience improvements in achievement if they are displaced from schools that are low-performing relative to nearby schools. Hence, school closings can be effective in raising the achievement of students in low-performing schools while imposing only modest negative spillover effects. However, a large-scale policy to close low-performing schools will fail to improve average achievement districtwide because any gains from displaced students will be offset by achievement losses for students in receiving schools.

Chapter 2

The Effect of Four-Day School Weeks on Student Achievement: Evidence from Hawaiian School Furlough Days

Changing the length of the school year is one of the most natural policy levers for affecting student achievement. Because changing how much time students spend in school has such dramatic potential consequences, policies that alter school year length garner much attention. On one hand, many observers have called for longer school years to improve student achievement, citing the fact that American schools have on average shorter school years than similar developed countries (Lee and Barro 2001). On the other hand, some school districts across the country have shortened their school years to ease budget deficits, generating substantial controversy. Because these policies may have profound effects on student learning, understanding the relationship between length of school year and student achievement is imperative for policymakers. While less instructional time theoretically harms student achievement, teachers may respond by covering more material in the school day, or parents may respond by obtaining after-school tutors. These behavioral responses may work to offset the negative effects of lost instructional time, and the magnitude of their effects is an empirical question.

The few quasi-experimental studies to examine the effect of school year length in modern educational settings use variations in instructional time that may not have been entirely salient to parents and teachers. The current study fills this void by investigating a school furlough day policy in Hawaii, which reduced the 2009–2010 school year for all public school students from 180 to 163 instructional days. This policy was well-publicized in advance and very salient to parents and teachers. In fact, while the furlough days were originally intended to be in place for two years, the government reached a deal with the teachers' union and a coalition of banks to eliminate furlough days for the 2010–2011 academic year. While charter schools saw reductions in funding, they were not mandated to take the furlough days, and the majority of charter schools took no school furlough days.

The analysis uses two identification strategies to isolate the effect of the furlough days on student achievement in

public schools in Hawaii. First, the study uses variation within furloughed public schools over time in an interrupted time series design, comparing student performance in academic year 2010 to the trend in test scores before and after the furlough day policy. However, this approach is unable to control for test-period effects that affected all students in 2010. Hence, the study also performs a difference-in-differences (DD) analysis, using unfurloughed charter schools as a control group. This design is able to control for test-period effects, but charter schools are an imperfect control group because they saw reductions in funding in the 2010 school year. Hence, the DD analysis is biased toward finding positive effects of the furlough days on student achievement.

The results indicate that school furlough days had negative effects on mathematics achievement in elementary school. The magnitude of these effects is well in line with prior literature, indicating that reductions in school year length hurt student achievement even in a scenario where the policy is well-publicized in advance and salient to teachers and parents. The results for middle and high school indicate no negative impacts from the school furlough days, however, which may indicate that teachers in these grade levels had an easier time adjusting the content of their material, or that students in these grade levels are less susceptible to educational interventions. All of these results are robust to a number of different specifications, and unobserved test-period effects are likely not large enough to substantially alter the results.

Chapter 3

The Frequency and Correlates of Teacher Grade-Level Reassignments: Evidence from Michigan

Teacher turnover, whether measured by attrition from the profession or mobility across schools, can disrupt the functioning of schools in a myriad of ways. For example, high rates of teacher turnover may reduce instructional quality, destabilize schools, and disrupt schools' curriculums and course offerings (Shields et al. 2001). Within-school teaching reassignments (i.e., grade-level and subject changes) and initial classroom assignments have similar consequences, as recent research suggests that teachers' returns to experience are greater when experience is accrued in the same grade and that the composition of teachers' initial classroom assignments significantly impacts subsequent mobility decisions (Feng 2010; Ost 2011). This evidence has led observers such as Jacob and Rockoff (2011) to argue that principals should think carefully about how to best allocate teachers to grades and subjects, as such decisions are typically noncontroversial yet may have substantial effects on student achievement.

The large literature on teacher turnover generally ignores the within-school sorting of teachers into grade levels. This is a glaring omission, as student achievement is affected not

only by the number of teachers new to the school, but also by the number of teachers who are teaching in a new assignment. In addition, within-school rates of grade switching are similar in magnitude to both rates of attrition from the profession and mobility across schools. Well-documented higher rates of teacher turnover in low-performing and impoverished schools suggest that such schools may necessarily experience more shuffling of teachers across grade levels and subjects. An inequitable distribution of within-school turnover in teaching assignments presents an additional challenge that students, teachers, and administrators in disadvantaged schools must overcome. The current study contributes to the literature on teacher turnover by investigating the teacher- and school-level predictors of grade switching and the relationship between grade switching and other types of teacher turnover.

We use rich administrative panel data on the universe of self-contained K–5 Michigan public school teachers during the 2003–2004 through 2008–2009 school years. These data are well suited for the analysis, as Michigan is home to a large demographically and socioeconomically diverse student population, the panel nature of the data allows individual teachers to be tracked over several years, and the large sample size provides sufficient power with which to identify the predictors of grade switching. In addition, we verify that the phenomenon of grade switching is not unique to Michigan by showing that rates of grade switching and other types of teacher turnover in the nationally representative Schools and Staffing Survey are similar to those in Michigan.

We find that grade switching is more prevalent in schools in urban areas, schools serving minority student populations, and schools with higher attrition rates. In addition, less experienced teachers switch grades more often, particularly those who are new to their schools. Grade switching strongly predicts future grade switching but not other types of turnover. Interestingly, there is significantly less grade switching in charter schools and no relationship between grade switching and schools' academic performance.

These results imply that in addition to higher rates of teacher turnover, urban schools with high concentrations of minority students also experience significantly higher rates of grade-level reassignments. This is true even after conditioning on school-level turnover rates and suggests that policymakers concerned with problems of teacher turnover in disadvantaged schools should pay similar attention to the inequitable distribution of grade-level reassignments.

References

- Common Core of Data. 2011. "Numbers and Types of Public Elementary and Secondary Schools from the Common Core of Data: School Year 2009–2010." Table 2. Washington, DC: National Center for Education Statistics. http://nces.ed.gov/pubs2011/pesschools09/tables/table_02.asp (accessed September 30, 2014).
- Feng, L. 2010. "Hire Today, Gone Tomorrow: New Teacher Classroom Assignments and Teacher Mobility." *Education Finance and Policy* 5(3): 278–316.
- Hanushek, E. A., J. F. Kain, and S. G. Rivkin. 2004. "Why Public Schools Lose Teachers." *Journal of Human Resources* 39(2): 326–354.
- Jacob, B. A., and J. Rockoff. 2011. "Organizing Schools to Improve Student Achievement: Start Times, Grade Configurations, and Teaching Assignments." The Hamilton Project Discussion Paper 2011-08. Washington, DC: Brookings Institution.
- Lah, K., and G. Botelho. 2012. "Union Opts to Continue Chicago Teachers Strike; Mayor Takes Fight to Court." http://articles.cnn.com/2012-09-16/us/us_illinois-chicago-teachersstrike_1_chicago-teachers-union-union-president-karen-lewis-union-delegates (accessed September 17, 2012).
- Lee, J.-W., and R. J. Barro. 2001. "Schooling Quality in a Cross-Section of Countries." *Economica* 68(272): 465–488.
- Lankford, H., S. Loeb, and J. Wyckoff. 2002. "Teacher Sorting and the Plight of Urban Schools: A Descriptive Analysis." *Educational Evaluation and Policy Analysis* 24(1): 27–62.
- Ost, B. 2011. "How Do Teachers Improve? The Relative Importance of Specific and General Human Capital." Working paper. Ithaca, NY: Cornell University.
- Shields, P. M., D. C. Humphrey, M. E. Wechsler, L. M. Riehl, J. Tiany-Morales, K. Woodworth, V. M. Young, and T. Price. 2001. *The Status of the Teaching Profession 2007*. Santa Cruz, CA: Center for the Future of Teaching and Learning.