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A second look at enrollment changes after the Kalamazoo Promise

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A Second Look at Enrollment Changes after the Kalamazoo Promise

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ABSTRACT

While previous research has documented how the Kalamazoo Promise, the most prominent and generous place-based college scholarship program, increased enrollment in Kalamazoo Public Schools, this paper qualifies and quantifies the characteristics of students who were induced to enter—or stay—in the district. In particular, it analyzes the origins and destinations, socioeconomic composition, and school-level sorting behavior associated with student flows around the time of the Promise announcement. These dimensions are more subtle than changes in the volume of students or measures of their individual success, but they are equally important to understand for communities exploring the feasibility of place-based scholarships as a local economic development tool. The findings suggest considerable economic benefits not just for the school district but for the broader metropolitan area.

JEL Classification Codes: I21, I25, J61, O18, R10

Key Words: Kalamazoo Promise, place-based scholarship, local economic development, enrollment, migration, selection

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A Second Look at Enrollment Changes after the Kalamazoo Promise

In November of 2005, the superintendent of the Kalamazoo Public Schools (KPS) district unveiled the Kalamazoo Promise, a scholarship that provides graduates of the district with up to 100 percent of tuition and fees at public colleges and universities in Michigan. Among the first place-based “universal” scholarships, so called because there are essentially no financial-need or academic requirements for eligibility beyond high school graduation, the Promise represents an interesting policy tool to strengthen local school systems and communities. Indeed, the existing research on its effects has found changes in college choice (Andrews, Desjardins, and Ranchod 2010), behavior and academic performance in high school (Bartik and Lachowska 2012), and, most directly, large increases in district enrollment (Bartik, Eberts, and Huang 2010).¹

In this paper, I take a more in-depth approach to examining the Promise’s effects on enrollment. Extending Bartik, Eberts, and Huang’s (2010) work, the current paper sheds light on three aspects of the Promise. First, it seeks to understand the origins of students entering the district and the destinations of those who leave it. Employing detailed, individual student data from KPS as well as enrollment data from other schools in Michigan, I jointly examine the flows of students among KPS, other districts, private schools and charter schools, and the impact of the Promise on these flows.² Because students coming from outside the district are more likely to represent new families in the community, they have potentially greater impacts on the economy than students who are induced to switch from private or charter schools (but not residential locations), and this relates directly to the efficacy of a Promise-like scholarship program on local

¹ Bartik, Eberts, and Huang (2010) document that, at the district and grade levels, the entry rate experienced a one-time surge in 2006, the first year after the Promise was announced, and a longer-lasting decline in exit rates subsequently.

² Charter schools have separate administrations and are not part of local education agencies; as such, charter school students are ineligible for the Promise.

economic development. Second, the paper investigates how the Promise affected the socioeconomic composition of students entering and exiting KPS. Student-level proxies for family income and scores from Michigan's standardized exams, the Michigan Educational Assessment Program (MEAP), can illustrate which types of students (and their families) are most responsive to place-based scholarships. Third, it delves beyond districtwide effects to describe enrollment changes at individual schools and attempts to relate these changes to characteristics of the schools and entering students. It is possible to study, for example, whether students induced to enter KPS by the Promise are more likely to choose a better-performing school, and whether this varies by the origin of the student or a proxy of her family income. The degree of this type of sorting could affect diversity and inequality of schools and neighborhoods.

Each of these aspects is important in understanding how the Promise influenced the enrollment decisions of different types of students, its impact on migration, and its role on spillovers in other school systems. Unfortunately, it is difficult to infer that the effects described below are strictly causal. A subset of KPS students were not randomly assigned to the Promise, so there can be no within-district comparison, nor are there detailed microdata from a comparable district to act as a control group.³ Nevertheless, the analysis represents the best attempts to answer these questions with the data available, and the descriptive evidence is compelling and supports the argument of Miller-Adams (2009).

I find that of the 40 percent jump in new KPS students in 2006, between 50 and 60 percent came from other Michigan school districts, about a quarter came from outside the state, and the remainder came from private or charter schools. Among the new entrants from other

³ Because Promise eligibility within KPS is in part based on length of enrollment, it is possible to do some within-district analysis for students already in the district (Bartik and Lachowska 2012). But as the focus of this paper is on student flows, this source of identification cannot be exploited.

Michigan districts that year, a statistical correlation procedure shows that just under 90 percent of them can be accounted for by other districts in Kalamazoo County, with a single neighboring district responsible for the lion's share. Exit rates from KPS fell starting in the 2005 school year and have remained almost a third lower than in the first half of the 2000s, with this decline proportionately spread out by destination. About 80 percent of the drop in students leaving for other Michigan districts is due to neighboring districts in the 2005–2006 school year, but this share subsequently falls to about half. That is, over time, KPS kept more students (and their families) who would have departed for elsewhere in the state outside Kalamazoo County.

New students to KPS after the Promise was announced were 7 percentage points (10 percent) less likely to qualify for free or reduced-price lunch than previous new entrants, and they also scored higher on the MEAP exam. Whereas the enrollment surge happened only in 2006, both socioeconomic effects lasted through 2007, illustrating that head counts alone do not capture the entire margin of response. These effects were statistically significant and economically meaningful, but modest, and the new students more closely resembled their incumbent peers rather than the relatively disadvantaged previous cohorts. Although there was no difference in lunch assistance for students exiting the district during the year of announcement, exiting students in subsequent years were more economically—but not academically—advantaged, suggesting that the Promise and the recession may have interacted in complex ways.

Additionally, new students in 2006, despite having higher socioeconomic and academic characteristics, were no more likely than new students in the past to choose schools that also performed well on these characteristics. Students entering in 2007 (and 2008), however, did show positive sorting, but it is difficult to distinguish how much of this change was due to

capacity constraints at schools in 2006 relative to improved information about schools' test scores following changes in the MEAP. Nonetheless, there is little evidence of differential sorting by student traits.

The next section of the paper describes in more detail the two main data sources used herein. The three following sections explain the methodology and results for each of the three topics laid out above. The last section concludes. (There is also an appendix that consists of several tables with alternative specifications or analyses that are individually referenced throughout the paper.)

DATA

To examine disaggregated enrollment patterns, I use two complementary data sources. The primary data set consists of KPS administrative microdata on individual students from 1997 through 2010 and is an updated version of the same data file used by Bartik, Eberts, and Huang (2010, henceforth BEH). These longitudinal data allow the same student to be tracked throughout her tenure at KPS and contain basic demographic data, a proxy for family income (free or reduced-price lunch status), MEAP standardized test scores, and information on enrollment starts, stops, and changes. Crucial for this study, the enrollment data provide entry and exit codes that indicate whether the student is new to the district or is continuing on, as well as whether she left in the middle of the school year. For new entrants, the codes ascertain her origin: another Michigan (public) school district, a private school, a charter school, from outside the state, and other sources. For students who left midyear, the codes provide similar detail for

the destination; if a student left between school years, however, one cannot observe where she went.⁴

The KPS microdata are supplemented with aggregate data on enrollment from other schools and school districts in Michigan. The Center for Educational Performance and Information (CEPI), part of Michigan's state budget office, has collected data on fall and spring head counts of students for each public school in the state (including charter schools) at the race-grade-gender level since 1991. For private schools, it has collected these data for each grade (but not gender or race) on an annual basis since 2001.⁵ These data can be linked to the detailed entry and exit counts from KPS to shed light on the *specific* districts (or charter or private schools) from which new KPS students come and to which exiting students depart, and the impact the Promise had on these relationships.

ORIGIN AND DESTINATION FLOWS

Overall Counts and Rates

Before analyzing the origins and destinations of KPS students before and after the Promise, I first replicate and update the findings from BEH that the number of new entrants experienced a one-time surge in the fall of 2006, the first year after the Promise was announced, and that exit rates fell and continued to remain low. Figure 1 plots the number of new entrants to KPS as of the official count day, by grade, for three time periods: the average for 2003 through 2005, 2006, and the average for 2007 through 2010. There are three things worth noting. First,

⁴ Just over half of exiters in kindergarten through grade 11 left between school years.

⁵ While the Common Core of Data from the U.S. Department of Education contains public school enrollment, race-grade-gender breakdowns are not available. Similarly, the Private School Survey contains private school enrollment, but these data are biennial and contain only grade aggregates (elementary or secondary), and even these have high non-report rates.

the number of new entrants generally declines as the grade rises, with the exception of 9th grade; this reflects an influx of students from charter and private schools, most of which top out at 8th grade. Second, the series for 2006 is substantially elevated relative to the earlier period in grades 1–9, but not grades 10–12.⁶ As BEH have written, this pattern is strongly suggestive of the 2006 surge being due primarily to the Promise, as eligibility for the scholarship required students to be enrolled in KPS since at least 9th grade. Third, the series for the post-Promise period lies almost directly on top of the pre-Period. This is also commensurate with a Promise effect, as there is no evidence of any secular trend that would otherwise cause the number of new entrants to rise over time.

Figure 2, on the other hand, shows exit rates. The exit rate is defined to be the fraction of students in KPS on a given fall count day who are not in KPS the following count day. Thus, the Promise year in this figure is 2005 rather than 2006. For grades K–8, exit rates fall by approximately one-third during the first year of the Promise announcement, and they stay at the reduced level over the next four years. For the high school grades, the pattern is slightly different. For the 2005–2006 retention year, the exit rate is substantially less than the average over the previous three years; for the subsequent four years, however, the exit rate has risen to a level between the initial Promise year and the preperiod.⁷ I discuss this feature below.

Inflows and Outflows

Turning to the sources of the inflows of new students, Figures 3 and 4 show the distribution, by origin, of new KPS students in the pre-Promise period and the first year after the

⁶ There is also a similar jump in total kindergarten enrollment; this is not shown in the figure because kindergarten represents first school entry for many students, while others (primarily low income) attended pre-kindergarten through KPS. Thus, defining the origin of a “new” kindergarten student is not straightforward.

⁷ Appendix Figures 1 and 2 repeat Figures 1 and 2 showing a separate series for each year. The latter appendix figure shows that the rise in exit rates for grades 9–11 has not been monotonic but is rather fluctuating from year to year.

Promise was announced. The number of new entrants was approximately 480, or 40 percent, higher in 2006 than averaged over 2003–2005.⁸ While just under half of new students came from other Michigan school districts in the preperiod, slightly over half did so in 2006. Approximately a quarter came from outside the state in both periods, with entrants from charter schools (14 to 12 percent) and private schools (4 to 5 percent) amounting for smaller shares. Interestingly, the fraction from “other” sources, a residual category that mostly picks up students returning from the juvenile justice system or reentering after having dropped out, falls by four percentage points.⁹

While these figures show that the overall composition of entrants changed only slightly (albeit statistically significantly, $\chi^2[5] = 32.3$, $p < 0.001$), with a slight increase in the share coming from other districts in the state, they belie the number of new students from each source. Table 1 provides these numbers, by grade. The first two panels contain the volume of entrants for each period, while the third panel provides their difference. Across grades 1–12, the number of new students from other Michigan districts increased by 303 students, or more than 50 percent. Out-of-state entrants jumped by 122 students, or 44 percent. Fewer new students came from private or charter schools, both in the mid-30s, although because the preperiod volume from private schools was small to begin with, the percentage increase was still 70 percent; charter school students increased by only 21 percent. New students from other sources actually declined slightly by 16 students. The last panel shows the *marginal* change in the distribution of entrants; that is, of the share of additional new students in 2006, where did they come from? More than three-fifths of the influx were from other Michigan districts, and fully a quarter were from out of

⁸ The official enrollment count for the district increased by 1,052 students between fall of 2006 and fall of 2005, but as BEH have noted, about half of this increase was due to fewer students leaving.

⁹ It turns out that the number coming from this category barely changes, even though the proportion falls. This is discussed further below.

state. Thus nearly 90 percent of the students entering KPS in 2006, over and above the average of the prior three years, were not local but physically moved into the district.¹⁰

Understanding outflows of students is more complicated, as the destination type is observed only for students who left midyear. Nonetheless, the decline in exit rates post-Promise seems to have been roughly proportionately distributed, as Figures 5 and 6 illustrate: the overall composition of exit by reason is little changed over time (although, again, the difference is statistically significant: $\chi^2[7] = 65.5$, $p < 0.001$). Districtwide, the exit rate for grades K–11 fell from 17.9 percent over 2002–2004 to 12.7 percent from 2005 through 2009, or between 400 and 450 fewer students leaving per year. As shown in Table 3, of the 5.2 percentage-point decline, 60 percent was due to a reduction in students leaving between school years, and 25 percent was due to a reduction in students leaving for other districts in Michigan mid-year. Both of these marginal percentage declines are slightly larger than the preperiod average shown in Figure 6, which is why their average shares decline slightly. Interestingly, the fraction of the decline that was due to between-year movers for grades 6 and 8 (the last grades before transition to middle school and high school over most of the time period) was nearly 75 percent, indicating that the Promise may have induced more of these students to stay in the district rather than leave at a natural break point.¹¹

¹⁰ This assumes that the three-year preperiod average serves as an adequate comparison. If the numbers of new entrants by source were trending up (down), the comparing the 2006 year to the preperiod average would bias the change upward (downward). A crude way to allow for this possibility is create a counterfactual for 2006 based on predictions from a linear trend, for each grade and source, over the period 2000–2005. The results are shown in Appendix Table 1. The net increase in new students is nearly 60 students larger than in Table 1, with most of the additions coming from charter and private schools (these had been trending downward). The conclusion that the vast majority of the increase in new entrants came from students outside the district, however, is unaltered. Appendix Table 2 provides averages over the earlier period of 1998–2002.

¹¹ Most of the elementary schools in KPS had grade ranges of K–6 until the fall of 2009, when 6th grade transitioned entirely to middle school. Constructing the exit rate only for 6th graders who would transition to middle school does not appreciably change the fraction of the decline due to between-year movers.

Table 3 assumes that exit rates by grade did not change in years following the announcement of the Promise. Figure 2 demonstrated there was no reason to doubt this assumption for grades 1–8, but it did not hold so well for the high school grades. Separate decompositions for the 2005 and 2006–2009 years confirmed that the composition of the exit rate decline was not appreciably different in these periods for the nonsecondary grades. They also revealed why the exit rates climbed for the later grades. The increase in 9th grade was widespread among the constituent parts; there were higher rates of interdistrict and interstate migration midyear, exiting between years, and dropout. The shift for 10th and 11th grades, however, was not due at all to intrayear migration, but was instead due to a slight rise in the dropout rate, a commensurate rise in the early graduation rate, and interyear migration. The most likely explanation for this behavior is that during the initial year of the Promise announcement, there was an enhanced option value for students on the margin of graduating to stay enrolled in the district to get a better sense of their chances at graduation (an excitement effect). While some of these students stayed and graduated (perhaps after repeating a grade), others realized it would be to no avail and subsequently dropped out—that is, some of the rise in exit rates was due to delayed graduation and dropout.

The Role of Neighboring Districts

Taken in total, the data on inflows and outflows by reason imply that the vast majority of the surge in enrollment in KPS following the Promise announcement was due to attracting—and keeping—students from outside the district boundaries, with a much smaller share relating to flows in and out of private and charter schools. While data limitations preclude us from saying much about out-of-state students, the CEPI data on enrollment in other Michigan school districts can help us understand transitions between KPS and specific donor and receiver districts. As

neighboring districts in particular tend to compete for students (and especially in a state like Michigan, where education finance is highly state-dependent), a district-level analysis can reveal the extent to whether new entrants come primarily from close-by districts, as well as which types of districts are most affected.

One way to investigate changes in the relationship between enrollments in KPS and other districts is to estimate the following equation:

$$E_{gy}^{KPS} = \tau_g + \sum_j \Delta enr_{jgy} \beta_j + \sum_j yprom \times \Delta enr_{jgy} \gamma_j + \sum_j aprom \times \Delta enr_{jgy} \delta_j + \varepsilon_{gy}, \quad (1)$$

where E_{gy}^{KPS} is the number of new entrants to (exits from) KPS from (to) other Michigan districts in a given grade g and year y (and is taken from the KPS microdata); τ_g are grade-specific dummies; Δenr_{jgy} is the change in enrollment in grade g between year y and $y - 1$ in district j ; $yprom$ is a variable that equals 1 in 2006 and 0 otherwise; and $aprom$ is a variable that equals 1 after 2006 and 0 otherwise. The parameter β_j represents how the number of entrants (exits) to KPS changes, averaged across grades, when enrollment in district j increases by one from the previous year, in years before 2006. That is, each β_j describes the association between changes in enrollment in a specific comparison district and that in KPS in the pre-Promise period. The coefficients γ_j describe how these associations change during 2006, the first school year after the Promise's announcement; similarly, the δ_j describe how the associations change in subsequent years (2007 forward) relative to the preperiod.

When E_{gy}^{KPS} consists of new entrants, γ_j are the coefficients of interest. While the factors influencing enrollment changes among all the school districts may be quite complex, under the assumption that this relationship did not suddenly change in 2006—other than because of the Promise—negative estimates of γ_j indicate from which districts new KPS entrants in 2006 came.

For exits, both γ_j and δ_j are interesting, as exit patterns may have changed over time, but the interpretation in this case is that *positive* estimates are associated with districts receiving fewer students from KPS.¹² While it would be ideal to run Equation (1) with all other Michigan school districts on the right-hand side, this is not feasible, as there simply are not enough observations to identify all of the parameters. Although it is somewhat restrictive, I limit the school districts included in estimation of (1) to the eight with coverage in Kalamazoo County.¹³ Economic theory predicts that students in these districts would be most affected by the Promise, as their close proximity would mean that a) they would be more likely to have heard about the Promise; b) moving would be less expensive; and c) parents would generally not have to change jobs. The exercise is thus meant to be illustrative, and it unfortunately cannot apportion how many of the in-state movers were from the surrounding area and how many were from farther away.

When Equation (1) was estimated for years 1998–2010 on grades K–12, the null hypothesis that $\delta_j = 0$ could not be statistically rejected for any district j , nor were any of the δ_j of a nontrivial magnitude. This is consistent with the aggregate series of new entrants in Figure 1 being indistinguishable in the pre- and postperiods. In order to improve precision, the constraint that $\delta_j = 0$ was imposed and the equation reestimated. The results from this procedure are shown in Table 4, with column 1 representing $\hat{\gamma}_j$ from the specification that includes all grades K–12. Of the eight districts, all but two estimates are negative, and of these, three are statistically significant and of a meaningful magnitude. The coefficient estimates for Climax-Scotts, Comstock, and Galesburg-Augusta (all to the east of KPS) range from -0.66 to -1.27 , indicating that, relative to the pre-2006 period, for every one student decline in enrollment in these districts,

¹² Since the number of exiters from KPS fell after the Promise and enrollment in other districts would be expected to fall if fewer students entered from KPS, there should be a positive relationship between the two.

¹³ These include the KRESA districts, essentially a county-level overdistrict that provides pooled services. Of the nine districts in KRESA, KPS is the largest throughout the time period.

KPS attracted 0.66 to 1.27 students from them.¹⁴ Table 4 also shows the net change in enrollment in the neighboring districts between 2005 and 2006. Although, Parchment and Portage experienced large falls in enrollment, the estimates of $\hat{\gamma}_j$ for these districts reveal that the declines were not unusual enough to imply that 2006 marked a break from previous vicissitudes. The Vicksburg district, although experiencing an enrollment decline, shows a statistically significant *positive* coefficient, suggesting that its correlation with other districts in the region is subtle and complicated.

Column 2 of the table leaves out kindergarten, as this grade represents first entry into any formal school for a large number of students and thus identification for whether they came from other districts is not clear. These results are reasonably robust to those in column 1, although the statistical significance weakens for Climax-Scotts, a very small district, and Vicksburg. To get a better sense of what these estimates mean in practical terms, I perform a simple decomposition that relates $\hat{\gamma}_j$ to the change in enrollment and the total number of new entrants to KPS from neighboring districts in 2006. That is, the estimates in column 1 (or column 2) are multiplied by the respective district's change in enrollment from 2005 to 2006, and these products are compared to the new entrants to KPS from other MI districts, beyond the historical average (see Table 1).¹⁵ The shares of the new KPS entrants accounted by the neighboring districts are shown in columns 3 and 4. The Comstock district accounts for the vast majority of new entrants to KPS, either 102 percent for the specification based on all grades, or 82 percent for the one that excludes kindergarten; it is an order of magnitude larger than any other district. Given their small

¹⁴ Note that estimates of γ_j can be below -1 if students who would have entered district j before 2006 now enter KPS instead.

¹⁵ Strictly speaking, this number in Table 1 (303) is not the right comparison, as it is relative to the average over 2003–2005, not 1998–2005 as calculated in the regression. Over the longer time period, the difference is 321, and this statistic is used in column 3 of Table 4.

sizes, it is perhaps not surprising that Climax-Scotts and Schoolcraft contribute little toward new KPS entrants, but Portage, with its relatively large enrollment and large drop in 2006, also plays a small role. Both Galesburg-Augusta and Parchment see small increases in their shares under the specification that excludes kindergarten, together accounting for just under one-fifth of the total. Across the eight districts, nearly 90 percent of the influx of students in 2006 can be explained, and this is after accounting for the negative shares in some of the districts. These high aggregate shares are consistent with the story above that close-by districts would be the most likely to be affected by the Promise.

While these estimates suggest that KPS attracted students from neighboring districts in 2006, they come with some caveats. First, it is not possible to determine separately how many of the students attracted to KPS physically left one of the other county districts and how many were induced to come from elsewhere in the state directly to KPS instead of another county district. Second, the marginal correlation analysis shows changes *relative to pre-Promise trends*, when KPS was losing enrollment to neighboring districts (BEH 2010). Third, these relationships based on entrants (or exits, as discussed below) show the effects only on school enrollment; they do not address the potential for broader economic effects to the entire metro area.¹⁶

Turning to the count of exits, Equation (1) was estimated on grades K–11 with the dependent variable equal to the sum of students exiting from KPS to other Michigan school districts midyear *and* those exiting between years. This is not ideal, as some students exiting between years left public education in Michigan altogether, but it is likely that the majority of students leaving for neighboring districts did so between years rather than midyear, and so they are included. Table 5 presents the estimates of γ_j and δ_j , as well as their differences, in

¹⁶ For example, the influx of out-of-state residents and their families likely boosted demand for local goods and services, the effects of which would extend beyond school district boundaries.

supercolumn (1). During the first year after the Promise, the association between KPS exits and enrollment changes strengthened in six of the eight districts, with most being statistically significant. The point estimate for Comstock is again quite large in magnitude at 2.28, indicating that, relative to 2005 and before, a one-student drop in enrollment was associated with 2.28 fewer students heading there from KPS. Drops were also pronounced in Climax-Scotts (0.95) and Galesburg-Augusta (0.79), but the relation actually went in the opposite direction for Portage (−0.49) and Vicksburg (−1.65). In these latter two districts, drops in enrollment were associated with KPS sending *more* students to them in 2006. Interestingly, the patterns change substantially in the years following the Promise’s announcement, as shown by the column for $\hat{\delta}_j$. These point estimates are uniformly smaller in magnitude than $\hat{\gamma}_j$, with half positive and negative, and most are not statistically different from zero. Indeed, the signs change from positive to negative for Galesburg-Augusta, Gull Lake, and Parchment, and from negative to positive for Portage. The case of Portage is particularly revealing, as both $\hat{\gamma}_j$ and $\hat{\delta}_j$ are significantly different from zero (as is their difference), implying that while KPS sent more students to Portage in 2006 than it had historically, over the next four years it sent substantially fewer. This and other reversals highlight the complex and dynamic nature of the decision to exit KPS: the hypothesis that the effects are the same in both the first and later years is rejected in five individual districts as well as jointly for all eight.

It follows that the role of these districts in explaining the reduction in outflows also changed over the post-Promise period. Thus, columns 3 and 4 perform an exercise similar to that in Table 4, wherein the contributions of each district toward the total reduction in exits from KPS are calculated. Column 3 shows these shares for 2006 and column 4 for the period 2006–2010. In general, the pattern in column 3 is quite close to the one in Table 4: the same districts that

received fewer students from KPS the first school year after the Promise were the ones that sent more students to KPS, with Comstock alone accounting for the whole fraction, on net. The other eight KRESA districts jointly accounted for 80 percent of the reduction in KPS exits to other Michigan districts that year. However, the profile is different in the later years, with Portage accounting for a quarter of the reduced exits, and Comstock for (only) another fifth. The share explained by the districts as a whole fell to 53 percent, suggesting that the share of the subsequent reduction in KPS exits due to nonlocal districts in the state has grown over time. In the following section, I investigate the compositional changes of entering and exiting students around the time of the Promise to better understand these dynamics.

COMPOSITION

Free and Reduced-Price Lunch Status

The data available to study changes in the socioeconomic distribution of students entering and exiting KPS, even in the administrative files, are limited. One of these metrics, commonly used in the education literature, is whether the student qualifies for free or reduced-price lunch.¹⁷ As in many urban school districts, a majority of KPS students are relatively low income and are served by this program—about 60 percent over the period 2003–2010. This average participation rate fluctuates with economic conditions (noticeably rising as the Great Recession begins), but it is also affected by the flow of students into and out of the district. The previous section showed that during the year after the Promise was announced, the origins of entering students changed.

¹⁷ Under the National School Lunch Program, administered by the U.S. Department of Agriculture, students at participating schools (which include nearly the universe of schools) qualify for a free lunch if their family incomes are less than 130 percent of the federal poverty threshold; if their family incomes are between 130 and 185 percent of the poverty threshold, they qualify for a reduced-price lunch of \$0.40. In KPS, of students who qualify for either program, about 90 percent qualify for free lunch.

Did their socioeconomic characteristics change as well? There is good reason to expect they might have. The benefit of the Promise is greater for students who go to the four-year universities in the state, and greater still for those who go to most selective universities (Michigan State University and the University of Michigan). Because the likelihood of attending selective four-year colleges rises sharply with family socioeconomic status, even when moving from the bottom quartile to the second quartile (Bailey and Dynarski 2011), the Promise may have reduced the share of new students who would be on free or reduced-price lunch.

Figure 7A presents time trends in the share of KPS students on free or reduced-price lunch, separately for entering and continuing students. The top left panel aggregates students from grades 1–12. In 2003 and 2004, new students were economically more disadvantaged than incumbents, with a 10-percentage-point greater share receiving lunch assistance. However, the gap between the two began to converge in 2005, before the Promise announcement, as the relative disadvantage of new entrants fell sharply. In 2006 and 2007, new entrants were actually slightly advantaged relative to continuing students (although the difference is not statistically significant); from 2008 on, both groups show steep increases due to the recession. The overall pattern is not inconsistent with the Promise attracting wealthier students in 2006, but the decline from 2004 to 2005, which is almost as large as that from 2005 to 2006, complicates interpretation. It is possible that the earlier decline is symptomatic of mean reversion—the new entrants series rises between 2003 and 2004, and the subsequent change could be a statistical fluctuation around a mean of about 0.7. It is also possible that the same factor that caused the decline in 2005 was also in effect in 2006, diminishing the role of the Promise. Without a longer pre-trend, which the data do not allow, it is difficult to determine from the graph which is more plausible.

Nevertheless, there are a few other pieces of evidence that hint that the effects are indeed Promise-related. One of these is in the middle-left panel, which shows the time trend for kindergarten. (Because kindergarten is the start of universal public schooling, all kindergarten students are counted as new.¹⁸) Unlike for grades 1–12, the drop in the share for kindergarten is exclusively a 2005–2006 event, with the lunch rate falling 7 percentage points. Here, the pattern for years 2003–2005 suggests random fluctuation around a stable mean. As entrance to KPS in kindergarten is required to gain the maximum benefit of the Promise, one would expect to see the largest incentive effects in that grade. More support for a Promise effect can be found in Figure A3 in Appendix A, which breaks down the lunch time-series by grade. The most pronounced declines in 2006 are in grades 1 and 2, and to a lesser extent grade 7. Again, the earlier grades have greater potential benefit from the Promise, so one would expect to find a larger effect there; the grade 7 decline in 2006 may be due to it being the usual beginning of middle school in KPS and surrounding districts that year—it is easier to change districts when one would change schools anyway. Notably, there is no evidence of a decline among new entrants in 2006 in grades 10–12, a group that is ineligible for the Promise.

The lower-left panel of Figure 7A combines all grades K–12. Because kindergarteners account for more than 40 percent of total new entrants in most years, they disproportionately affect the series for that group. In the combined panel, the sudden drop in assisted lunch status between 2005 and 2006 is readily apparent, even as the rate rises slightly for incumbent students. It is interesting that the new-student rate remains low in 2007: although the quantity surge of new students into KPS was a one-time event in 2006 (Figure 1), compositional differences of new

¹⁸ About a quarter of kindergarten students have preexisting records in KPS; of these, 90 percent were in prekindergarten or child care programs for low-income students and the remainder were previously in kindergarten. Restricting the sample to kindergarteners without a preexisting KPS record reduces the level of the series in Figure 7 by 3 percentage points each year but negligibly affects the pattern of changes.

students may have been more persistent. The beginning of the recession in 2008 makes it difficult to say how much more persistent, though, as it is not clear how much of the rise in the rate for new entrants is due to return to trend and how much is recession-driven.^{19,20} In any case, it is worth mentioning that the changes in rates seen in the figure are not an artifact of changes in racial or gender composition. When the distribution of gender, ethnicity, and grade levels are held constant over time, as in the right column, the patterns of the time series are unaltered.²¹ In summary, there was a moderate reduction in the free and reduced-price lunch rate of new students in 2006, especially relative to incumbent students, and this drop was particularly focused among the youngest grades. This provides cautionary evidence that the Promise did induce modest, positive socioeconomic selection among new students for a brief time.

But what about exiting students? The same logic as for entering students could apply, which would imply that exiting students could be poorer following the Promise announcement. On the other hand, students from more affluent families likely have more options (or stronger preferences) to choose higher-performing districts than their less economically fortunate peers, and the Promise may thus have had greater retention effects among relatively poorer students.²² Figure 7B shows that this latter explanation seems to better fit the data. Although exiting students are 7–8 percentage points more likely to be on assisted lunch than continuing students

¹⁹ The relatively steep increase between 2007 and 2008 for new entrants is partially due to the closing of Kalamazoo Advantage Academy, a charter school serving a nearly exclusively low-income, high-minority population, after 2007 and the entrance of most of these students into KPS. Excluding these students produces results very similar to the reweighted trends shown in the second column of Figure 7.

²⁰ The next section on MEAP scores also suggests positive selection of new entrants through 2007, but not beyond.

²¹ In additional analysis by demographic characteristic, no appreciable differences were found in the time series by gender, although the decline in lunch assistance in 2006 was nearly twice as large for whites as it was for blacks.

²² This logic may seem to be at odds with that for attracting wealthier entering students, but it need not be. Households headed by a college graduate are likely to have greater income and be more geographically mobile than less-educated households (Molloy, Smith, and Wozniak 2011). Thus, they may be more likely to move in to and move out of KPS in the wake of the Promise.

before the Promise announcement, the rate for the former groups falls shortly in the 2006–2007 and 2007–2008 school years, to a level below that of staying students. Interestingly, there is no change in the 2005–2006 school year. This could mean that some families took a wait-and-see approach initially, effectively postponing their decision to move for a year. However, there are two complications in interpreting these results. First, the reduction in lunch assistance among exiters is concentrated among midyear leavers—students exiting *between* school years become poorer in 2006 and 2007. This pattern would generally not accord with wealthier families postponing moving. Second, while the assisted lunch rate rises gradually for continuing students from 2007 on, as would be expected due to the Great Recession, the rate for exiting spikes abruptly in 2009, which is somewhat puzzling. While Figure 7B suggests exiters were more positively selected after the Promise (at least through 2008), the data are not clear as to how or why, and further investigation is warranted.

MEAP scores

Another metric for looking at changes in composition is more directly tied to achievement—students’ MEAP scores in reading and math. This measure has advantages and disadvantages relative to the lunch status measure as a proxy for a student’s background. One advantage is conceptual: MEAP scores more directly measure academic aptitude than income-based measures, and there is strong correlation with higher scores and high school graduation and college-going.²³ A second advantage is practical: unlike the binary lunch measure, MEAP scores are continuous and exhibit much more variation across students, allowing a finer level of detail into composition. However, there are also several shortcomings. First, they are not as

²³ A one-standard deviation increase on the MEAP, averaged across grades, is associated with a 17-percentage-point increase in the likelihood that a typical 12thgrader will graduate and enroll in college.

widely available as lunch status. The MEAP test was redesigned beginning in 2005, so there is a much more limited pre-Promise period against which to evaluate trends. (Indeed, the lack of a preperiod forestalls using MEAP scores to analyze compositional changes of exiting students.) Second, the test is given only in grades 3—8, so sample sizes are smaller. Third, as a high-stakes test (it is used for accountability under No Child Left Behind), it is potentially manipulable, although the analytical strategy used should mitigate this issue. Altogether, it is a useful complement to lunch status in assessing how composition of student flows changed around the time of the Promise.

The MEAP scores that students receive (and that are in our data) are reported as scaled scores, which are designed to have statewide means that rise by (approximately) 100 each grade and a standard deviation of 25 within each grade. In order to make the scores comparable across time and grades, I transform them into effect sizes relative to the 2005 distribution. That is, I subtract from each score the statewide grade-specific mean in 2005 and then divide by 25. The result shows how many standard deviation units away a student is from the average student in the state in the same grade in 2005.

Figure 8 presents four panels of trends in average standardized MEAP scores from 2005 to 2010. (For each of these years, the MEAP was administered in October, shortly after the beginning of the school year.) Each panel contains a series for new entrants (those entering KPS in the year shown) and for stayers, students who were enrolled on the previous year's count day. The most obvious feature in the figure is the steady overall rise in MEAP scores over time—this phenomenon has been documented by BEH (their Table 6), who show also that this increase was

not unique to KPS but was a statewide trend.²⁴ The rise may reflect real gains in achievement or it may reflect greater teaching to the test, but by comparing new entrants to stayers within a time period, this issue can largely be sidestepped by effectively netting out the overall time trend.²⁵ The top two panels show scores for math (left) and reading (right). In both cases, the scores of new entrants in 2005—before the Promise was announced—are about 0.12 standard deviations below the scores for stayers, and these differences are statistically significant at the 5 percent level. In 2006, scores rise for both groups but do so faster for new entrants. For math, the gap narrows to 0.04 standard deviations, and for reading it narrows to 0.01 standard deviations; neither is statistically significant. Interestingly, scores for new students remain relatively high in 2007 before dropping sharply in 2008 and remain below stayers' through 2010. While this pattern is consistent with a short-lived, Promise-induced effect on positive selection into KPS in 2006 and 2007, without a longer pre-Promise trend it is hard to be confident that another factor is not at play.²⁶ The bottom row presents similar trends but adjusts the data to hold the composition of students fixed in terms of grade, sex, ethnicity, and lunch status. This procedure mitigates, but does not eliminate, the faster growth of new entrants between 2005 and 2007; while about half of the positive selection in 2006 and 2007 is due to these observables, another half remains unexplained.²⁷

While the trends in means provide a useful summary, they do not provide a complete picture of how selection changed across the entire MEAP score distribution. For example, the

²⁴ BEH provide suggestive evidence that this trend was less pronounced for a set of urban school districts with characteristics similar to KPS.

²⁵ Also, because the exams take place about six weeks after the school year begins, it is unlikely that the score of new entrants are significantly affected by instruction in KPS; rather, they more likely reflect composition of entering students.

²⁶ If the Promise is the driving factor, it is interesting that although the quantity of new students in 2007 is not elevated, the “quality” is.

²⁷ The observable component with the largest effect is the change in lunch status, as documented above.

mean of entering students can rise because more students come from the upper part of the distribution rather than the middle, or it could rise because more students come from the middle part of the distribution rather than the bottom. Knowing the type of selection is important not only because it has implications for average yearly progress under accountability programs, but also because it speaks to the levels of students (or their families) that are most affected by Promise programs.²⁸ Figures 9 and 10 thus examine the entire distribution of MEAP scores for math and reading. In both figures, the top left panel shows the difference in density between new entrants and returning students in 2005. Positive values indicate that new entrants were more likely to have the given score (on the x-axis) relative to returning students, and vice versa.

For both math and reading, there is significant positive mass between -4 and -2 and negative mass between 0.6 and 2.2 .²⁹ Because the units are scaled to the statewide (standard normal) distribution in 2005, this means that new entrants relative to continuing students in 2005 were disproportionately focused in the bottom 5 percent of the state distribution at the expense of the top third. The remaining five panels show how the density in the top left panel *changed* in each subsequent year, relative to the base year of 2005. That is, they are the distribution equivalent of differences-in-differences. The top right panel, for instance, shows that, relative to 2005, the gap between new entrants and stayers narrowed in 2006 because of an influx of students with scores between 0 and 2 , nearly the entire upper half of the distribution. For math, there is a decline both in the extreme lower tail and between -1 and 0 , while the decline is more diffused across the bottom half for reading. The interpretation is that the first year after the Promise, the faster growth in MEAP scores of new entrants was due to proportionally more of

²⁸ In Michigan, proficiency is determined by scores exceeding a threshold, so changes within either side of this threshold would not affect proficiency, even though they would affect the mean.

²⁹ Adding up the positive and negative mass yields zero; adding up the mass weighted by the score, of course, yields the mean difference of -0.12 shown in Figure 8.

these students coming from high up in the statewide distribution, roughly at the 85th percentile, and not from the middle.³⁰ Since students scoring in this range typically go to (and graduate from) four-year colleges (Bailey and Dynarski 2011), this makes sense, as these students have the most to gain financially from the Promise.

The pattern of change is quite different for later years. Although means continued to rise faster for new entrants relative to stayers in 2007, the center-left panel shows that this growth represented a shift from the bottom to the middle of the distribution, and this was somewhat more pronounced for math than reading. To the extent that the Promise induced students and their families to move into KPS, these patterns suggest that the higher-ability students moved sooner while middle-ability students (still higher than the KPS average) held off for a year. This could be rationalized if it took middle-ability students and their families longer to learn about the Promise, if there was more uncertainty about their college intentions, or if their mobility was more income-constrained—all of which are plausible. Fall of 2008 marked the financial crisis, and there is strong negative selection of new entrants that year, with large mass gains between -2 and 0 . The last two years show more mass in the center and less in the tails, but there is little overall change in selection.

But how much of these mass changes are due to changes in composition in sex, ethnicity, grade, and particularly lunch status? The semiparametric reweighting procedure proposed by DiNardo, Fortin, and Lemieux (1996), can help answer that question. In essence, the DiNardo, Fortin, and Lemieux procedure uses propensity weights to make one group resemble another. In this case, the weights are designed to make returning students in each year from 2006 through 2010 resemble returning students in 2005 along the four dimensions mentioned above; the same

³⁰ This is relative to the statewide distribution. Because KPS has a lower mean than the state, the new entrants are coming from higher than the 85th percentile of the KPS score distribution.

process is repeated for new entrants. The results of this exercise are shown in Figures 11 and 12. The top-left panel in both figures is the same as before, but the other panels have been adjusted. For years 2007–2010, the changes are relatively small, and the patterns of increases or decreases in mass are preserved from the raw data for both math and reading. For 2006, however, the reweighted mass changes are more striking: the positive mass that had been centered around a score of 1 is somewhat smaller, the negative mass around 0 is somewhat larger, and the relatively flat region between -2 and -1 (or -2.5 to -1.5 for reading) now has significant positive mass.

In context, this tells us that selection through the observable demographic channels (mostly lunch status) was most predominant the first year after the Promise announcement. The reduction in the relative share of students on free or reduced-price lunch among new students that year was associated with a sizable movement in the score density from around the 10th statewide percentile to the 85th percentile. Even holding the demographics fixed, the increase in density at a score greater than 1, not repeated in any other year, demonstrates that the positive selection on unobservables of new entrants that year was concentrated among high-performing students.³¹ Furthermore, that adjusting for demographic composition affects the 2006 change in density appreciably, but minimally so for the other years, lends credence that the Promise itself, and not other factors, was behind the immediate change.³²

Taking the lunch status and MEAP score results in concert, there is a fair amount of evidence that the Promise influenced the socioeconomic and academic composition of students entering and leaving KPS. In both dimensions, new students became more positively selected

³¹ These unobservables could include more extensive measures of family background, including parental education, wealth, intrinsic motivation, and other factors known to correlate with test scores.

³² Altonji, Elder, and Taber (2005) develop methods for bounding the selection on unobservables relative to selection on observables. While possible, it seems unlikely that chance would strongly influence change in observables one year but not any of the others.

after the Promise announcement, although this effect was modest: in general, new matriculants more closely resembled incumbent students rather than appearing relatively disadvantaged to them, as they had previously. While this selection was short lived, it persisted through 2007, unlike the boost in the quantity of new entrants. Students who left KPS after the Promise announcement were less likely to be poor than previously, and because fewer students were leaving overall, there was slight negative selection among stayers, the effect of which seems to have lasted through 2008. However, the later timing of this trend makes it harder to infer it was due to the Promise and not some other factor; indeed, this negative economic selection was not apparent at all in MEAP test scores, though limited pre-Promise data make it difficult to conclude much in this case.

SCHOOL-LEVEL EFFECTS

Since the inflow of new students in the two years after the Promise announcement appears to have been positively selected, it is natural to ask whether the schools these new students chose to attend were also positively selected. That is, did the new students (or their parents) disproportionately seek out schools in KPS that had aggregate statistics above average for the district in terms of MEAP scores or lunch status? The answer has implications for neighborhood-level development: if there is positive sorting, then already-advantaged schools (relatively speaking) will grow more so, and school catchment areas that struggle will be less likely to benefit. While economic theory would predict positive sorting under full information, it is possible that parents may not be well-informed about which schools have high test scores and

more affluent students—particularly if they come from farther away—or that neighborhood housing markets or school capacity limits impede desired school choice.³³

I examine the extent of positive sorting through a multinomial logit model, which allows the choice of school to be a function of characteristics of the student.³⁴ More specifically, let school choice among new students be modeled as

$$\Pr[sch_{it} = j] = \frac{\exp(\alpha_j + \mathbf{X}_{it}\boldsymbol{\delta}_j)}{\sum_k \exp(\alpha_k + \mathbf{X}_{it}\boldsymbol{\delta}_k)}, \quad (2)$$

where $\Pr[sch_{it} = j]$ is the probability that new student i chooses school j in year t , \mathbf{X}_{it} is a vector of individual characteristics, including grade, ethnicity, gender, lunch status, time period of entry, and (sometimes) own MEAP score, and α_j is a school-specific intercept. The parameter vector $\boldsymbol{\delta}_j$ varies by school and relates how individual characteristics affect choice at each school. Because the choice set of schools varies by grade, Equation (2) is run separately for elementary school students, middle school students, and high school students. The choice set is complicated somewhat by two school openings in the estimation period (a new elementary school opens in 2008 and a new middle school in 2009) and a shift of 6th grade from elementary school to middle school in 2009.³⁵ To avoid difficulties in both estimation and interpretation, the estimation sample runs from 2003 through 2008 and excludes 6th graders.

³³ It is important to note that higher test scores or more affluent students do not mean that a school is “stronger” or “better” than another; that is they do not capture value added, or the difference between how the same student would fare at different schools. Although this latter effect is presumably what parents care about, it is difficult to measure, even with extensive data, and parents may instead use aggregate statistics of a school an imperfect proxy for value added.

³⁴ More general mixed logit models that allow choice to be a function of characteristics of the schools and students (including what is called McFadden’s choice by economists and alternative-specific conditional logit by Stata; see Cameron and Trivedi 2005, p. 495) were also considered, but these models had difficulty converging.

³⁵ Three elementary schools—Edison, Washington, and Woods Lake—transition out of 6th grade earlier.

Table 6 shows the 16 elementary, 3 middle, and 3 high schools in KPS during the sample period, along with two socioeconomic variables: the average fraction of each school's students participating in the federal lunch program and the school's average standardized MEAP score, both for the period 2003–2005.³⁶ Even though KPS as a whole has a higher percentage of low-income students and lower MEAP scores than the state average, there is considerable variation across schools. At Woods Lake Elementary, for example, over 80 percent of students received lunch assistance and the average MEAP score was a full standard deviation below state average; at Indian Prairie Elementary, on the other hand, less than 30 percent participated in the lunch program and students scored about half a standard deviation above the state average. The next three columns show the empirical distribution of school choice among new students for three periods: 2003–2005, 2006, and 2007–2008. These unconditional probabilities suggest that the influx of new students in 2006 altered their school choices relative to their predecessors: in particular, Lincoln, Parkwood-Upjohn, and Maple Middle saw notable increases in their share. Interestingly, none of these schools ranked highly on the specified characteristics, although schools that were at the bottom of the distribution (e.g., Edison, Northeastern, Northglade, Milwood Middle, and Woods Lake) did lose share.

³⁶ Official data are used for these measures, rather than the microdata, because the official numbers are more likely to be known by the public. (Using the microdata produces very similar results.) The lunch data are taken from official counts published by CEPI at https://www.michigan.gov/cepi/0,1607,7-113-21423_30451_36965---.00.html. The construction of the MEAP scores is more involved, as official releases of school-level scale scores began only in 2007. Prior to that year, only the shares of students in each of four proficiency levels were released. To create a consistent scale score measure, I first regress school-level scale scores, pooled for 2007–2010, on the fraction in each proficiency level and a set of school dummies, and do this separately for each grade and test (math and reading). I create predicted values from these regressions (R^2 measures are typically greater than 0.95), including for the out-of-sample periods 2003–2006. (That is, I impute scale scores for the period before the MEAP redesign as well.) The predicted scale scores are standardized to the 2005 state distribution, as described previously, and the simple average of these standardized scores, across grades and math and reading, is calculated for each school and year.

A more formal approach to examining changes in the choice distribution can be found in the last two columns, which present results from Equation (2). The estimates represent the marginal change in the probability of choosing a given school in 2006 (2007–2008) relative to 2003–2005, controlling for grade, ethnicity, gender, and lunch status. (They illustrate whether schools became more or less attractive to the average student, whereas the unconditional probabilities conflate this effect with changes in the demographic composition of entrants.) In general, the story is quite similar: Lincoln and Maple Middle receive a large boost in share in 2006, although Parkwood-Upjohn’s unconditional increase weakens somewhat once demographics are controlled, and Milwood Elementary’s increases. As noted, none of these schools has especially high average test scores or socioeconomic statistics; the schools that do, such as Indian Prairie, Winchell, and Hillside Middle, show no evidence of taking in a greater share of students in 2006—if anything, their shares decrease slightly. While Lincoln and Maple Middle are both magnet schools, and one might posit that this factor explains their share growth in 2006, Edison, Spring Valley, Washington, Woods Lake, and Woodward are also magnet schools (and with similar statistics), but they each lose share in 2006.

The apparent lack of positive sorting in 2006 may be due to informational constraints, school capacity constraints, or other factors that families care about but which are not observed (e.g., a great principal). Some evidence that the last of these channels is not dominant, at least for elementary schools, can be found in the last column of Table 6. These results show that the elementary schools with the lowest test scores and highest poverty, Northglade and Woods Lake, saw the sharpest reduction in shares of new students in the 2007–2008 period, while schools that looked better on paper, King-Westwood and Prairie Ridge, experienced gains. The increase in positive sorting in the later period took place after the one-time surge in new students in 2006

(Figure 1), which may have created short-lived capacity constraints at certain schools.³⁷ On the other hand, the increase in sorting also coincides with increased reporting of school test scores stemming from a redesign of the MEAP in 2005 (scores for which were not released until 2006).

To investigate the possibility of capacity constraints that were ameliorated in subsequent years, Table 7 presents a matrix that illustrates how initial school choices of new students changed one year later. Within each panel, the three columns show the probability that the student was enrolled in the same school the following fall, the probability that she had changed to another KPS school, and the probability that she had left KPS. For example, among new students who entered Arcadia Elementary in 2003 or 2004, 64 percent were still enrolled in Arcadia the following year (2004 or 2005), 9 percent had switched schools, and 27 percent had exited the district.³⁸ (These numbers, like the rest of those in the table, refer to entering students whose *next* grade is taught at the school of entry; grades for which transition to a new school would be expected the following year are excluded.) If crowding were an issue, new students in 2006 would be less likely to have attended their first-choice school than previous new students, and, as a consequence, they would have been more likely to switch schools the following year. However, the evidence in support of this hypothesis is relatively weak. The aggregate switching rate for elementary schools is 11.6 percent for new entrants in 2003–2004 *and* 2006, and rises only slightly to 13.2 percent afterward. While schools with better statistics tend to see switching rates fall (King-Westwood, Prairie Ridge, Winchell), and those with worse statistics see their switching rates rise (Edison, Spring Valley, Washington), these institutions did not see a large influx of new students in 2006. The school that did, Lincoln, has its switching rate nearly

³⁷ The simple correlation (for elementary schools) between lunch (MEAP scores) and sorting changes in 2006 is 0.07 (–0.04); for sorting changes in 2007–2008, it is –0.25 (0.56).

³⁸ The astute reader will recognize that exit rates in Table 7 are higher than in Figure 2. The population of new entrants tends to be more mobile than the population of continuing students.

quintuple, from 3.3 percent to 15.8 percent. While this would appear to be strong support of crowding, it comes with a substantial caveat: Lincoln is a magnet school specializing in languages, and it was announced in the spring of 2007 that its popular Spanish immersion program would not continue the following fall because of logistic complications (Mack 2008). Thus, it is not clear how much of the increase in Lincoln's switching rate for the 2006 cohort is due to Promise-induced crowding and how much is due to a(n) (independent) curricular change. While capacity constraints most likely explain some of the lack of positive sorting in 2006, they are not the clear driver.

Information constraints, therefore, would seem to be predominant, but evidence to this effect is not particularly strong, either. It is normally thought that richer families are at least as well informed as poorer families when it comes to school choice (Chakrabarti and Roy 2010). However, new students who were not on the assisted lunch program exhibited *negative* sorting in 2006 and (weakly) positive sorting in 2007 and 2008. Poorer students, in contrast, exhibited positive sorting in both periods, although the relationship strengthened after 2006 (Table A3). Similarly, it is reasonable to expect that students coming from other districts in Michigan would be better informed about school characteristics than those coming from elsewhere in the country, but both exhibit weak negative sorting in 2006, followed by positive sorting in the later period (Table A4).³⁹ The absence of the expected socioeconomic or location gradient in school sorting behavior in 2006 does not necessarily imply that information constraints were not important; rather, the paucity of information about schools in the earlier period might have been severe enough to affect all groups roughly equally. Unfortunately, this conjecture cannot be tested.

³⁹ Students with local origins are probably better informed still, but because they are less likely to have changed residences when entering KPS, they are more likely to be subject to catchment zones and have less choice.

Nonetheless, the main result is that new students who entered KPS the year after the Promise announcement, despite being of slightly higher socioeconomic status, did not differentially sort into schools with fewer poor students or higher test scores. New students who entered in 2007 or 2008, on the other hand, did exhibit positive sorting, and this increase over time was probably due to a combination of information and school capacity constraints in 2006 that loosened in the following years.

CONCLUSION

While previous research has documented how the Kalamazoo Promise has increased enrollment in the KPS district, this paper has sought to qualify and quantify the characteristics of students who were induced to enter—or stay—in the district. In particular, it analyzes the origins and destinations, socioeconomic composition, and school-level sorting behavior associated with student flows around the time of the Promise announcement. These dimensions are more subtle than changes in the volume of students or measures of their individual success, but they are equally important to understand for communities exploring the feasibility of place-based scholarships as a local economic development tool.

The majority of the students who entered KPS the year after the Promise was announced were from outside the district; fewer than a quarter were transfers from local private or charter schools. This suggests household migration into the district.⁴⁰ In fact, a quarter of new students came from out of state, and these out-of-state migrants likely had economic effects on the entire

⁴⁰ Subsequent work will analyze migration and real estate markets more directly. In preliminary analysis of migration using the American Community Survey, I have found a positive migration response into the Kalamazoo area in 2006 for households with children relative to those without; however, the estimates are not very precise.

Kalamazoo area.⁴¹ Over half of new students came from other Michigan districts, and most of these were from within the county. These latter students presumably changed housing locations, but because they came from the same labor market area, it is likely that their parents or guardians did not have to change jobs. Thus, the labor market response among these movers is likely to have been weaker than the housing market response. Conversely, because the proportion of exiting students going to neighboring districts fell from 80 percent to 50 percent in the years following the Promise announcement (even though the reduction in the *number* of exiting students grew larger), it is probable that the metropolitan labor market kept more jobs than it otherwise would have.

New students who entered KPS in 2006 were more socioeconomically advantaged than previous new students, and this effect lasted through 2007 even though the volume of new students had returned to earlier levels. This selection was relatively modest, as the new students more closely resembled their incumbent peers, who still fall well below the state average on MEAP scores and income proxies, rather than the even more highly disadvantaged previous cohorts. This transitory positive effect on the composition of new students is tempered by suggestive evidence of a similar positive effect on the composition of exiting students. While the Promise may have attracted students from a greater socioeconomic stratum, its effectiveness at keeping them is more subdued. Because exit rates fell overall, more of these types of students stayed in the district, although poorer students were even more likely to stay. As these changes were too small to affect the makeup of the student body as a whole, composition is likely to play a minimal role in macro effects from Promise-type programs.

⁴¹ For example, parents of these students may have taken jobs throughout the metropolitan area, and their demand for goods and services would extend beyond school district boundaries.

The Promise also does not appear to have had any immediate impact on school or neighborhood sorting. New students entering KPS in subsequent years were more likely to choose schools that had fewer students on assisted lunch programs and higher MEAP scores, but it is unclear how much this difference can be attributed to the Promise rather than better knowledge about MEAP scores over time or a relaxation of binding capacity constraints in 2006. As there is little evidence that different types of students sorted differentially that year, it is not the case that the more advantaged students induced to enter because of the Promise disproportionately enrolled at schools with better statistics. Thus, the Promise itself probably had little influence on measures of diversity and inequality across schools, at least insofar as new students are concerned.

Although this paper adds to our understanding of how place-based scholarships can affect local economic development through short-term behavioral changes of families with students, more research is needed on evaluating longer-term effects, particularly on the extent to which beneficiaries remain in the area for participation in the labor market (and the amount and types of postsecondary schooling they receive). These outcomes have been difficult to study because of data limitations and an insufficient time horizon, but both of these issues should be surmountable in the next few years.

Appendix

Table A1 New Students to KPS by Grade, Counterfactual, and Reason

	K	1	2	3	4	5	6	7	8	9	10	11	12	Total (1–12)
2006 counterfactual														
Other MI district	15	80	75	47	52	47	45	40	38	66	45	24	27	584
Outside of MI	9	21	30	33	20	25	16	25	7	37	25	9	19	266
Private	1	5	2	0	3	1	2	1	1	17	2	1	2	37
Charter	1	12	6	17	16	9	9	11	12	41	1	0	0	135
First school entry	350	4	0	0	0	0	1	0	0	0	0	0	0	6
Other	318	12	6	5	2	6	6	7	9	24	11	7	21	116
Total	693	134	120	102	92	88	78	83	68	185	83	41	69	1,143
2006 actual														
Other MI district	20	94	102	105	70	69	72	64	75	110	46	33	33	873
Outside of MI	8	44	26	46	35	35	36	24	35	56	21	13	28	399
Private	3	15	10	10	6	8	8	4	5	18	5	1	0	90
Charter	1	32	16	23	14	22	17	17	12	44	0	0	0	197
First school entry	678	2	0	0	0	0	0	0	0	1	0	0	0	3
Other	46	15	8	8	3	7	7	3	3	30	13	9	14	120
Total	756	202	162	192	128	141	140	112	130	259	85	56	75	1,682
Difference, actual – counter														
Other MI district	5	14	27	58	18	22	27	24	37	44	1	9	6	289
Outside of MI	–1	23	–4	13	15	10	20	–1	28	19	–4	4	9	133
Private	2	10	8	10	3	7	6	3	4	1	3	0	–2	53
Charter	0	20	10	6	–2	13	8	6	0	3	–1	0	0	62
First school entry	328	–2	0	0	0	0	–1	0	0	1	0	0	0	–3
Other	–272	3	2	3	1	1	1	–4	–6	6	2	2	–7	4
Total	63	68	42	90	36	53	62	29	62	74	2	15	6	539
% share of difference														
Other MI district		21	63	65	51	42	44	82	60	60	75	59	98	54
Outside of MI		34	–8	15	43	19	33	–2	45	25	–254	26	143	25
Private		15	19	11	8	13	10	11	6	1	200	0	–33	10
Charter		30	23	7	–5	24	13	22	–1	4	–42	0	–4	12
First school entry		–4	0	–1	–1	0	–1	0	0	1	0	0	0	–1
Other		4	4	3	4	2	2	–14	–10	8	121	16	–104	1
Total		100	100	100	100	100	100	100	100	100	100	100	100	100

NOTE: The “counterfactual” is based on a linear prediction estimated on years 2000–2005. The “Other” category includes students entering from home schooling and those returning from a juvenile facility or having dropped out. Shares may not sum to totals because of rounding. See text for more details.

Table A2 New and Exiting Students to KPS by Grade and Reason: Earlier Period

	K	1	2	3	4	5	6	7	8	9	10	11	12	Total (1–12)
New Students														
1998–2002 (average)														
Other MI district	13	62	57	50	50	47	40	44	46	63	37	30	20	551
Outside of MI	5	36	28	30	25	24	23	21	25	32	18	16	17	296
Private	1	8	4	4	5	5	4	8	7	28	6	5	2	87
Charter	2	21	21	16	17	17	15	15	5	6	0	0	0	133
First school entry	596	13	2	1	0	0	0	0	0	0	0	0	0	17
Other	64	13	8	11	11	8	11	7	8	34	17	12	10	149
Total	680	153	120	117	109	101	93	95	90	162	79	64	49	1,233
Exiting Students														
														Total (K–11)
1998–2001 (average)														
Other MI district	34	39	36	35	34	32	24	28	29	38	20	14	5	360
Outside of MI	21	18	19	13	13	16	13	13	10	17	7	6	4	166
Private	0	1	0	1	1	0	1	1	1	0	1	1	0	5
Charter	6	5	5	4	6	4	3	1	0	0	0	0	0	33
Dropout	0	0	0	0	0	0	0	1	1	31	33	24	15	88
Graduated	0	0	0	0	0	0	0	0	0	0	1	8	231	9
End of year	91	87	83	85	77	74	75	67	73	89	66	47	125	911
Other	4	2	1	2	2	2	2	4	10	33	27	28	33	117
Total	156	151	143	139	132	127	116	113	123	207	154	126	413	1,688
Exit Rate (%)														
1998–2001 (average)														
Other MI district	3.8	4.2	3.8	3.7	3.7	3.6	2.8	3.2	3.5	3.7	2.5	2.2	1.1	3.4
Outside of MI	2.4	2.0	2.0	1.4	1.4	1.8	1.5	1.5	1.2	1.7	0.8	0.9	0.8	1.6
Private	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1
Charter	0.6	0.5	0.5	0.4	0.7	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.3
Dropout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	3.0	4.1	3.7	3.3	0.8
Graduated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	50.1	0.1
End of year	10.1	9.4	8.9	9.0	8.4	8.3	8.7	7.8	8.7	8.8	8.2	7.4	27.1	8.7
Other	0.5	0.2	0.1	0.2	0.2	0.3	0.2	0.4	1.2	3.3	3.3	4.4	7.2	1.1
Total	17.4	16.4	15.4	14.8	14.4	14.4	13.5	13.3	14.8	20.5	19.2	19.9	89.6	16.1

NOTE: The “counterfactual” is based on a linear prediction estimated on years 2000–2005. The “Other” category includes students entering from home schooling and those returning from a juvenile facility or having dropped out. Shares may not sum to totals because of rounding. See text for more details.

Table A3 Multinomial Logit Estimation of Equation (2), Choice of School for New Entrants, By Lunch Status

	Not on lunch program			On lunch program		
A: Elementary	P ²⁰⁰³⁻²⁰⁰⁵	dP ²⁰⁰⁶	dP ²⁰⁰⁷⁻²⁰⁰⁸	P ²⁰⁰³⁻²⁰⁰⁵	dP ²⁰⁰⁶	dP ²⁰⁰⁷⁻²⁰⁰⁸
Arcadia	0.042	-0.0074	0.0034	0.039	0.0048	0.0010
Edison	0.013	0.0085	0.0093	0.081	-0.0149	0.0121
Greenwood	0.029	0.0002	0.0043	0.028	-0.0084	-0.0011
Indian Prairie	0.116	-0.0101	-0.0100	0.024	0.0031	0.0039
King-Westwood	0.096	0.0022	0.0377**	0.057	0.0039	0.0003
Lincoln	0.024	0.0166**	-0.0037	0.091	0.0271**	0.0096
Milwood	0.062	0.0165	-0.0105	0.092	0.0019	0.0204**
Northeastern	0.023	0.0096	0.0155*	0.081	-0.0084	-0.0129
Northglade	0.044	0.0027	-0.0170*	0.061	-0.0118	-0.0361**
Parkwood-Upjohn	0.106	0.0148	0.0148	0.053	0.0045	0.0117*
Prairie Ridge	0.084	0.0088	0.0329**	0.054	-0.0021	0.0100
Spring Valley	0.053	-0.0188*	-0.0199**	0.052	0.0092	-0.0097
Washington	0.017	0.0038	0.0014	0.079	-0.0019	0.0119
Winchell	0.157	-0.0352*	-0.0191	0.026	0.0036	0.0074
Woods Lake	0.082	-0.0082	-0.0287**	0.115	-0.0098	-0.0398**
Woodward	0.052	-0.0041	-0.0106	0.067	-0.0008	0.0113
B: Middle						
Hillside	0.381	-0.0833	0.0324	0.279	-0.0084	-0.1115**
Maple	0.339	0.1193*	-0.0252	0.347	0.1379**	0.0770*
Milwood	0.280	-0.0360	-0.0072	0.374	-0.1295**	0.0344
C: High						
Central	0.404	0.1588**	0.1588**	0.421	0.0145	0.0504
Loy Norrix	0.504	-0.1246**	-0.0503	0.477	0.0306	0.0144
Phoenix	0.092	-0.0342**	-0.1085**	0.102	-0.0451**	-0.0648**

NOTE: The columns show marginal changes in probability for the selected demographic groups between 2003–2005 and the specified periods, controlling for grade, gender, ethnicity, and lunch status. Asterisks indicate statistical significance (* p < 0.10, ** p < 0.05). See Table 6 for other notes.

Table A4 Multinomial Logit Estimation of Equation (2), Choice of School for New Entrants, By Origin

A: Elementary	Other MI district			Outside MI			Other (Local)		
	P²⁰⁰³⁻²⁰⁰⁵	dP²⁰⁰⁶	dP²⁰⁰⁷⁻²⁰⁰⁸	P²⁰⁰³⁻²⁰⁰⁵	dP²⁰⁰⁶	dP²⁰⁰⁷⁻²⁰⁰⁸	P²⁰⁰³⁻²⁰⁰⁵	dP²⁰⁰⁶	dP²⁰⁰⁷⁻²⁰⁰⁸
Arcadia	0.043	0.0087	0.0165	0.059	0.0096	-0.0009	0.036	-0.0031	-0.0018
Edison	0.066	0.0032	-0.0049	0.075	-0.1095**	0.0255	0.061	-0.0035	0.0129*
Greenwood	0.023	-0.0054	0.0152*	0.026	-0.0012	-0.0329*	0.032	-0.0068	-0.0033
Indian Prairie	0.032	-0.0084	0.0130	0.039	-0.0406*	-0.0017	0.058	0.0058	-0.0070
King-Westwood	0.069	0.0048	0.0198	0.093	-0.0044	-0.0239	0.065	0.0031	0.0139*
Lincoln	0.045	0.0169	-0.0002	0.101	0.0846**	-0.0395	0.079	0.0150	0.0130
Milwood	0.122	0.0041	0.0168	0.093	-0.0256	-0.0176	0.069	0.0180*	0.0128
Northeastern	0.088	-0.0132	-0.0226*	0.023	0.0379**	0.0132	0.064	-0.0087	0.0006
Northglade	0.036	-0.0023	-0.0262**	—	—	—	0.064	-0.0030	-0.0257**
Parkwood-Upjohn	0.059	0.0129	0.0289**	0.072	-0.0035	0.0110	0.071	0.0099	0.0060
Prairie Ridge	0.092	-0.0320*	-0.0118	0.078	-0.0190	0.0112	0.049	0.0196**	0.0279**
Spring Valley	0.068	0.0008	-0.0338**	0.008	0.0299**	0.0297**	0.053	-0.0072	-0.0131*
Washington	0.073	0.0153	0.0114	0.062	0.0132	0.0353*	0.057	-0.0076	0.0024
Winchell	0.052	0.0027	-0.0129	0.049	0.0047	0.0278	0.069	-0.0176*	-0.0005
Woods Lake	0.090	-0.0105	-0.0135	0.173	-0.0095	-0.0781**	0.102	-0.0081	-0.0381**
Woodward	0.044	0.0024	0.0043	0.049	0.0333	0.0408**	0.073	-0.0057	-0.0001
B: Middle									
Hillside	0.240	0.0295	0.0124	0.339	-0.0485	-0.1999**	0.375	-0.1831**	-0.0874
Maple	0.326	0.1589**	0.0256	0.375	0.1471*	0.1117	0.278	0.1012	0.0320
Milwood	0.434	-0.1884**	-0.0381	0.286	-0.0987	0.0882	0.347	0.0818	0.0554
C: High									
Central	0.433	0.0496	0.1034**	0.483	0.1042*	0.0085	0.316	0.0543	0.1577**
Loy Norrix	0.479	-0.0175	-0.0058	0.468	-0.0740	0.0130	0.517	-0.0147	-0.0465
Phoenix	0.088	-0.0321*	-0.0976**	0.049	-0.0302	-0.0215	0.167	-0.0396	-0.1113**

NOTE: The columns show marginal changes in probability for the selected demographic groups between 2003–2005 and the specified periods, controlling for grade, gender, ethnicity, and lunch status. The “Other” category includes students from private schools, charter schools, and homeschooling, as well as dropout returns and re-entrants from the criminal justice system. Entrants from outside Michigan to Northglade Elementary were too few to estimate reliably, and so they are omitted. Asterisks indicate statistical significance (* p < 0.10, ** p < 0.05). See Table 6 for other notes.

Table A5 Multinomial Logit Estimation of Equation (2), Choice of School for New Entrants, By MEAP

	Lowest Tertile			Middle Tertile			Highest Tertile		
	P ²⁰⁰³⁻²⁰⁰⁵	dP ²⁰⁰⁶	dP ²⁰⁰⁷⁻²⁰⁰⁸	P ²⁰⁰³⁻²⁰⁰⁵	dP ²⁰⁰⁶	dP ²⁰⁰⁷⁻²⁰⁰⁸	P ²⁰⁰³⁻²⁰⁰⁵	dP ²⁰⁰⁶	dP ²⁰⁰⁷⁻²⁰⁰⁸
A: Elementary									
Arcadia	0.045	-0.0084	-0.0148**	0.050	0.0064	0.0023	0.099	-0.0167	-0.0200
Edison	0.094	-0.0203*	-0.0082	0.041	0.0122	-0.0005	0.008	0.0066	0.0006
Greenwood	0.006	0.0038	-0.0024	0.009	0.0037	0.0047	0.008	0.0058	0.0059
Indian Prairie	0.008	-0.0022	-0.0006	0.024	-0.0061	0.0002	0.039	-0.0018	0.0059
King-Westwood	0.059	-0.0046	0.0084	0.110	-0.0092	0.0042	0.194	0.0099	-0.0081
Lincoln	0.111	0.0093	0.0160	0.081	-0.0140	-0.0289**	0.046	0.0028	-0.0284**
Milwood	0.094	0.0167	0.0177	0.096	-0.0093	0.0132	0.074	0.0034	0.0035
Northeastern	0.060	0.0015	-0.0107	0.059	0.0039	-0.0005	0.039	-0.0092	-0.0134
Northglade	0.054	-0.0127	-0.0064	0.017	0.0275**	0.0171	0.023	-0.0045	-0.0071
Parkwood-Upjohn	0.053	0.0063	0.0115	0.062	0.0107	0.0195	0.068	0.0240	0.0406**
Prairie Ridge	0.034	0.0032	0.0000	0.069	-0.0007	0.0033	0.093	-0.0019	0.0064
Spring Valley	0.090	-0.0036	-0.0029	0.072	-0.0051	-0.0193*	0.021	-0.0036	0.0016
Washington	0.082	0.0009	-0.0058	0.071	-0.0118	-0.0181	0.041	-0.0154*	-0.0207**
Winchell	0.039	0.0008	-0.0054	0.100	-0.0048	-0.0107	0.169	-0.0020	0.0154
Woods Lake	0.111	-0.0057	-0.0120	0.074	0.0025	0.0186	0.031	0.0154	0.0322**
Woodward	0.062	0.0148	0.0157*	0.065	-0.0057	-0.0049	0.046	-0.0128	-0.0143
B: Middle									
Hillside	0.294	-0.0170	-0.0331*	0.398	-0.0501	-0.0413	0.558	-0.0894**	-0.0420
Maple	0.351	0.0369	0.0087	0.383	-0.0285	-0.0283	0.321	0.0532	0.0414
Milwood	0.355	-0.0198	0.0243	0.220	0.0787**	0.0696**	0.121	0.0362	0.0006

NOTE: The columns show marginal changes in probability for the selected demographic groups between 2005 and the specified periods, controlling for grade, gender, ethnicity, and lunch status. Distributions reflect grades for which MEAP was tested (grades 3–5 for elementary; 7–8 for middle). Tertiles are relative to the statewide distribution in 2005. Asterisks indicate statistical significance (* p < 0.10, ** p < 0.05). See Table 6 for other notes.

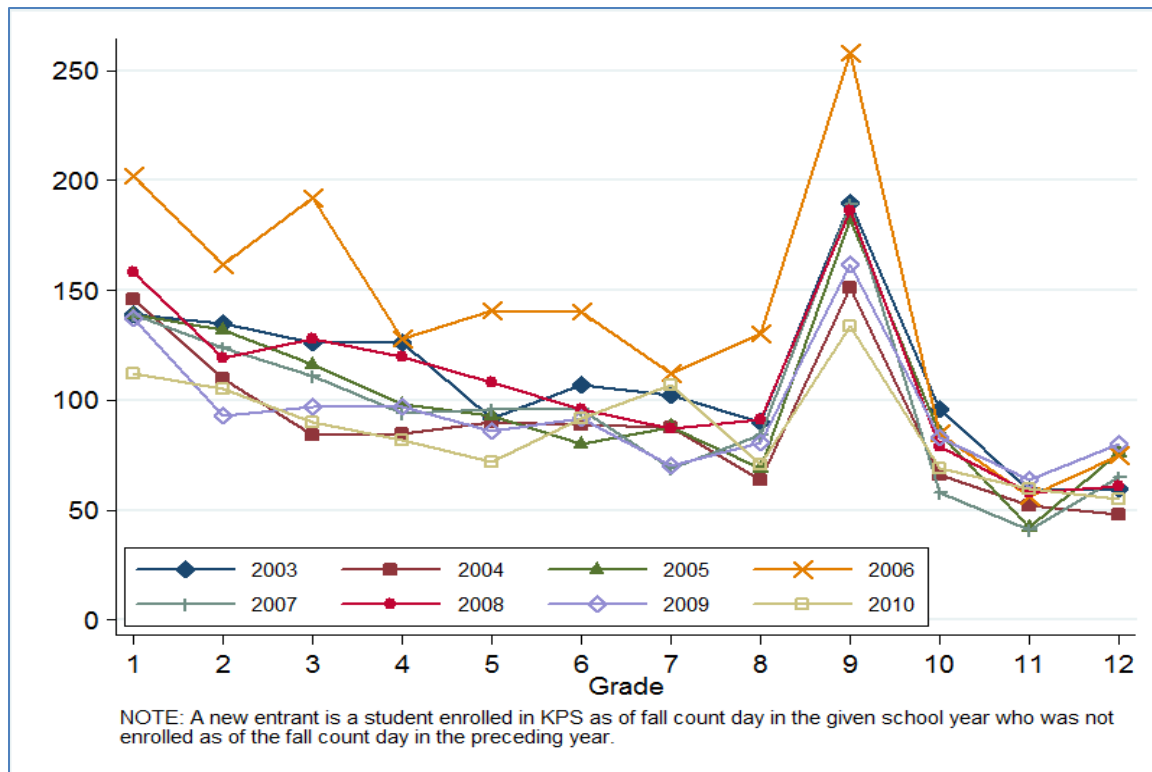


Figure A1 New Fall Student Entrants to KPS, by Grade and Year

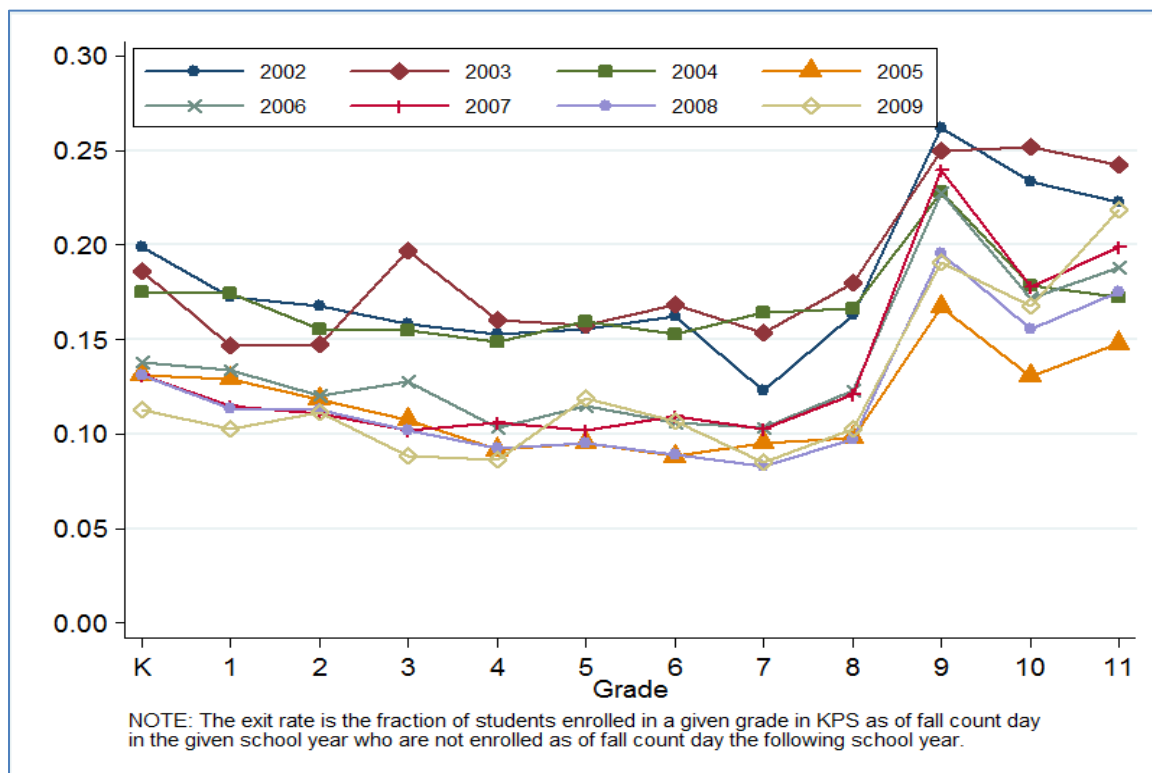
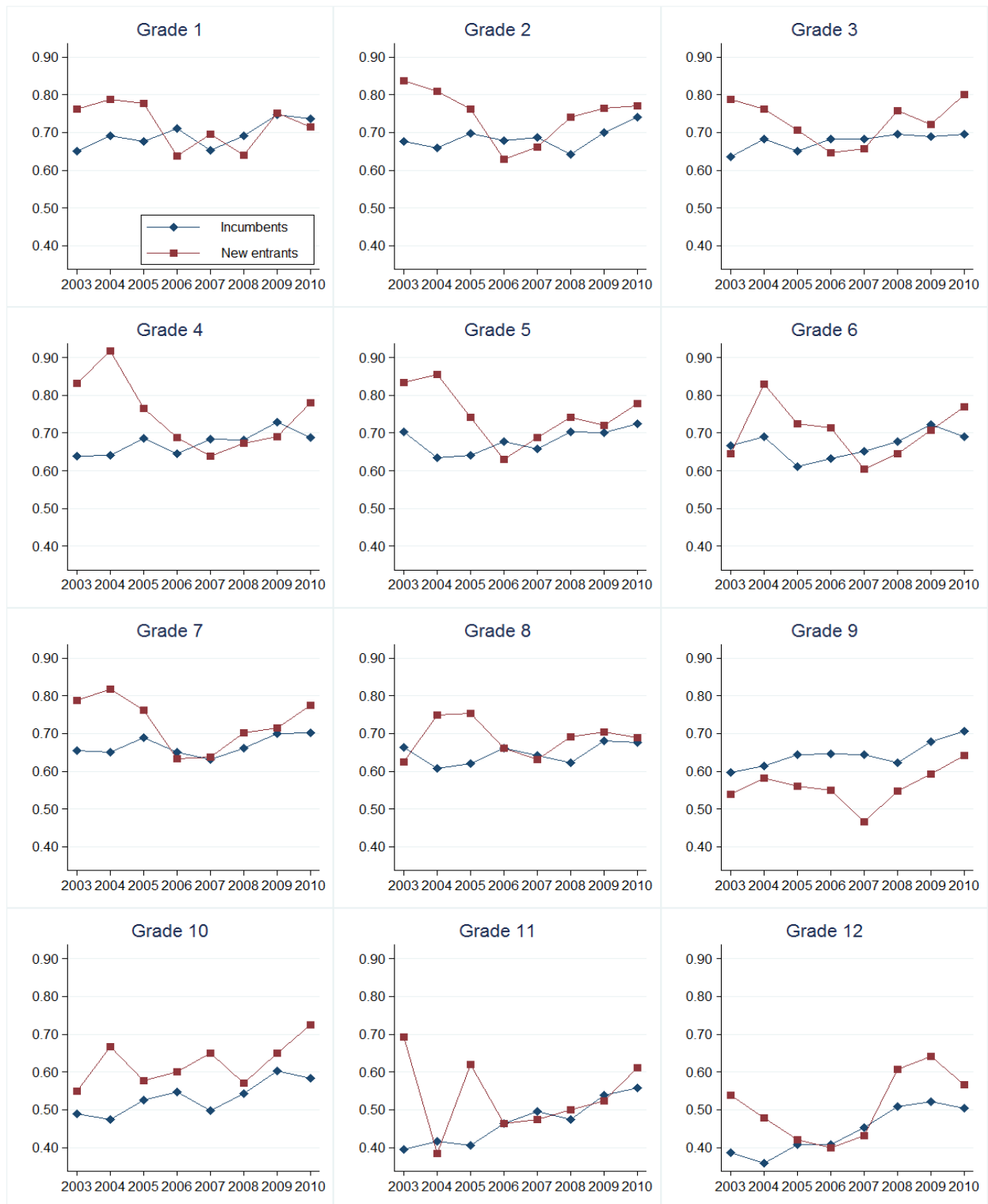
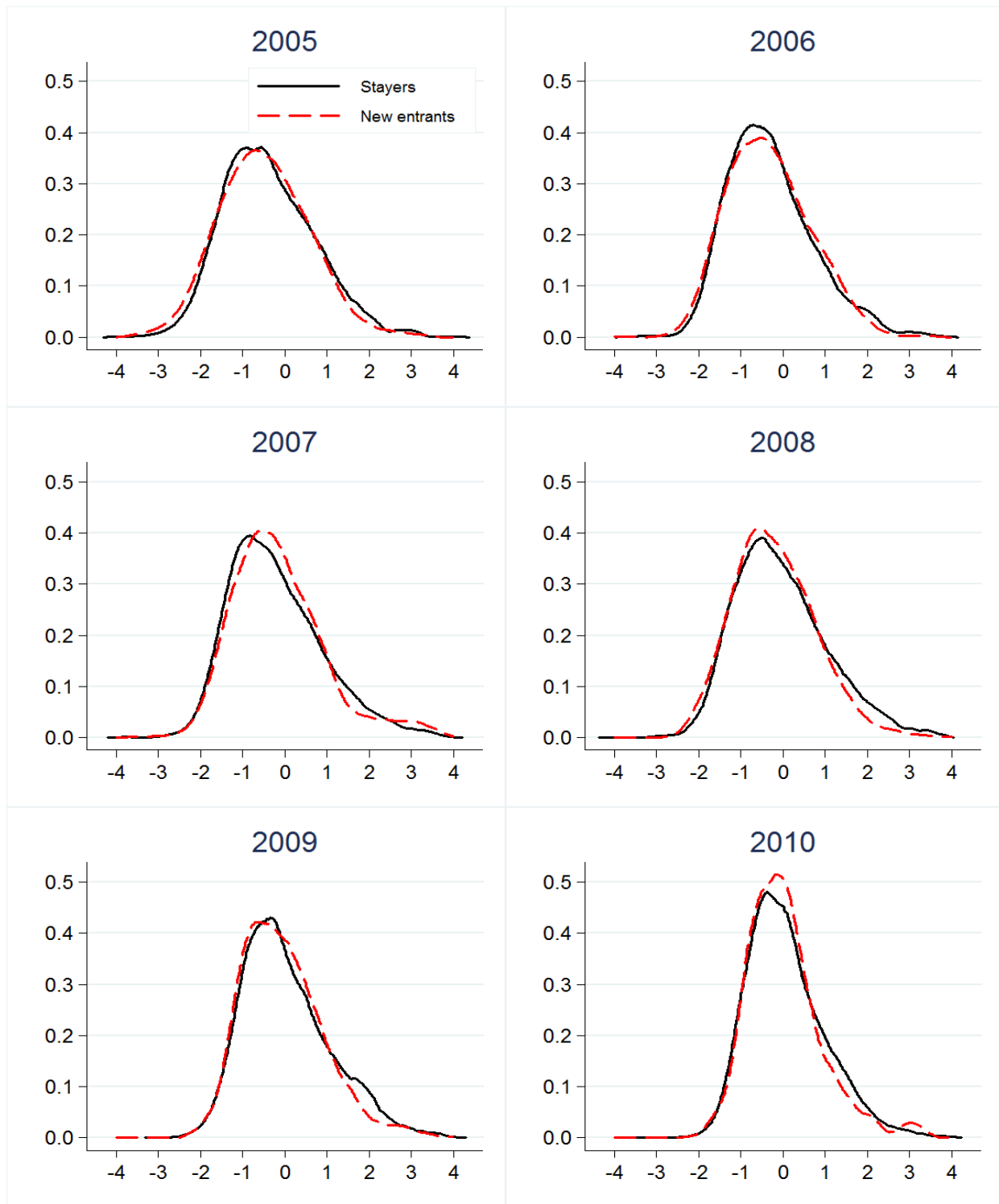


Figure A2 Student Exit Rates from KPS, by Grade and Year



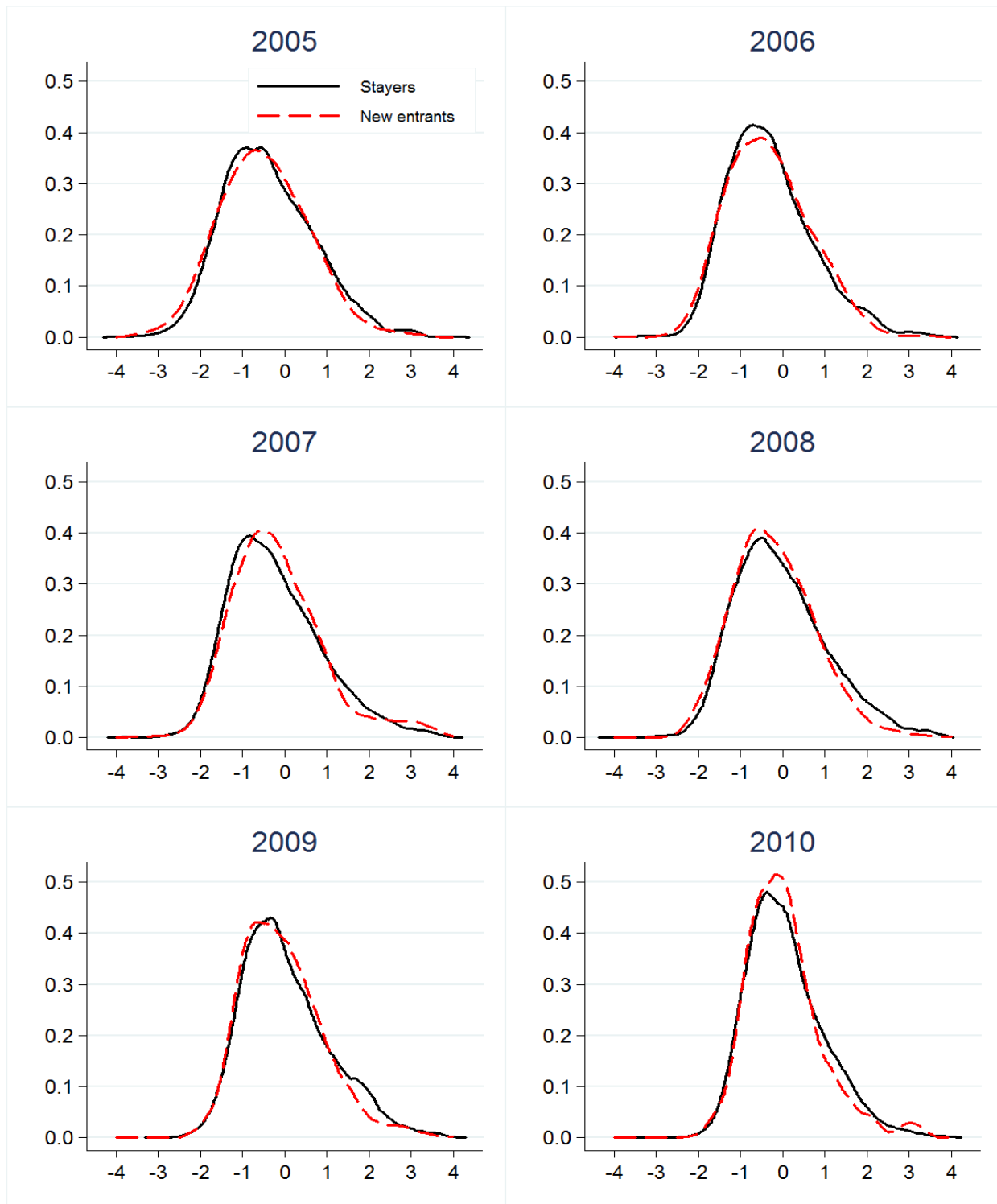
NOTE: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year.

Figure A3 Free and Reduced-Price Lunch Status, by Grade, Entry Status, and Year



NOTE: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year. Scores are in standard deviation units. Densities use the Epanechnikov kernel with optimal plug-in bandwidth.

Figure A4A Standardized Math MEAP Score Densities, KPS Students, by Entry Status and Year



NOTE: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year. Scores are in standard deviation units. Densities use the Epanechnikov kernel with optimal plug-in bandwidth.

Figure A4B Standardized Reading MEAP Score Densities, KPS Students, by Entry Status and Year

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Table 1 New Students to KPS by Grade, Time Period, and Reason

	K	1	2	3	4	5	6	7	8	9	10	11	12	Total (1–12)
2003–2005 (average)														
Other MI district	17	73	67	52	50	46	44	41	39	67	41	27	23	570
Outside of MI	8	24	29	28	24	23	20	25	13	36	23	13	18	277
Private	1	6	3	2	4	1	2	3	3	20	5	1	2	53
Charter	1	20	17	19	20	14	16	17	12	27	0	0	0	163
First school entry	364	6	1	1	0	0	1	0	0	0	0	0	0	9
Other	291	12	9	7	6	7	9	7	8	25	13	10	18	130
Total	682	141	126	109	103	92	92	93	75	175	82	51	62	1,200
2006														
Other MI district	20	94	102	105	70	69	72	64	75	110	46	33	33	873
Outside of MI	8	44	26	46	35	35	36	24	35	56	21	13	28	399
Private	3	15	10	10	6	8	8	4	5	18	5	1	0	90
Charter	1	32	16	23	14	22	17	17	12	44	0	0	0	197
First school entry	678	2	0	0	0	0	0	0	0	1	0	0	0	3
Other	46	15	8	8	3	7	7	3	3	30	13	9	14	120
Total	756	202	162	192	128	141	140	112	130	259	85	56	75	1,682
Difference, post less pre														
Other MI district	3	21	35	53	20	23	28	23	36	43	5	6	10	303
Outside of MI	0	20	–3	18	11	12	16	–1	22	20	–2	0	10	122
Private	2	9	7	8	2	7	6	1	2	–2	0	0	–2	37
Charter	0	12	–1	4	–6	8	1	0	0	17	0	0	0	34
First school entry	314	–4	–1	–1	0	0	–1	0	0	1	0	0	0	–6
Other	–245	3	–1	1	–3	0	–2	–4	–5	5	0	–1	–4	–10
Total	74	61	36	83	25	49	48	19	55	84	3	5	13	482
% share of difference														
Other MI district		35	96	63	80	48	58	119	64	52	200	120	73	63
Outside of MI		32	–8	21	45	24	33	–3	40	23	–88	0	75	25
Private		14	20	10	9	14	12	5	4	–3	–13	–7	–13	8
Charter		20	–3	5	–23	16	2	–2	1	20	–13	0	–3	7
First school entry		–7	–3	–1	–1	0	–1	0	0	1	0	0	0	–1
Other		5	–3	2	–11	–1	–4	–19	–10	6	12	–13	–32	–2
Total		100	100	100	100	100	100	100	100	100	100	100	100	100

NOTE: The “Other” category includes students entering from home schooling and those returning from a juvenile facility or having dropped out. Shares may not sum to totals because of rounding. See text for more details.

Table 2 Exiting Students from KPS by Grade, Time Period, and Reason

	K	1	2	3	4	5	6	7	8	9	10	11	12	Total (K–11)
2002–2004 (average)														
Other MI district	36	37	27	32	27	31	24	27	26	57	36	26	13	386
Outside of MI	20	17	14	15	13	15	18	16	13	23	9	4	7	176
Private	1	0	1	0	1	0	1	1	0	0	1	0	0	5
Charter	5	3	3	5	6	3	4	3	2	0	0	0	0	34
Dropout	0	0	0	0	0	0	0	2	3	31	28	21	13	84
Graduated	0	0	0	0	0	0	0	0	0	1	3	24	493	27
End of year	103	86	84	84	74	78	84	68	86	115	68	43	25	973
Other	5	2	2	3	3	3	2	5	8	27	20	12	22	93
Total	170	144	131	139	125	130	133	122	138	253	165	129	574	1,780
2005-2009 (average)														
Other MI district	31	33	28	22	17	16	17	19	18	42	19	13	13	275
Outside of MI	13	15	14	13	12	12	12	11	10	16	9	4	12	142
Private	1	1	1	0	0	0	1	0	0	0	0	0	0	6
Charter	1	2	2	1	2	1	3	3	1	0	0	0	0	16
Dropout	0	0	0	0	0	0	0	1	3	43	25	21	24	94
Graduated	0	0	0	0	0	0	0	0	0	0	3	35	469	39
End of year	84	67	63	60	53	61	48	37	48	105	50	33	34	709
Other	3	3	2	1	2	1	2	5	7	24	10	6	15	65
Total	134	122	109	98	86	91	83	75	87	232	116	112	567	1,346
Difference, post less pre														
Other MI district	-5	-4	0	-10	-10	-15	-7	-8	-8	-14	-17	-13	0	-111
Outside of MI	-6	-2	-1	-2	-2	-3	-5	-5	-3	-6	0	0	4	-35
Private	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Charter	-4	0	-1	-4	-5	-3	-1	0	-1	0	0	0	0	-18
Dropout	0	0	0	0	0	0	0	-1	0	12	-3	1	12	10
Graduated	0	0	0	0	0	0	0	0	0	0	1	11	-25	12
End of year	-19	-19	-21	-24	-21	-17	-36	-31	-38	-10	-18	-10	10	-265
Other	-2	1	0	-2	-1	-2	-1	0	-2	-3	-11	-6	-8	-28
Total	-36	-23	-22	-41	-39	-39	-50	-47	-51	-21	-49	-17	-6	-434

NOTE: The “Other” category includes students leaving for home schooling, a juvenile facility, or unknown whereabouts. Shares may not sum to totals because of rounding. See text for more details.

Table 3 Exit Rates (Percentage) from KPS by Grade, Time Period, and Reason

	K	1	2	3	4	5	6	7	8	9	10	11	12	Total (K–11)
2002–2004 (average)														
Other MI district	4.0	4.2	3.3	3.9	3.4	3.8	2.9	3.2	3.2	5.5	4.8	4.2	2.2	3.9
Outside of MI	2.2	1.9	1.7	1.8	1.6	1.8	2.1	1.9	1.6	2.2	1.2	0.7	1.2	1.8
Private	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1
Charter	0.5	0.3	0.4	0.6	0.8	0.4	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.3
Dropout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	3.0	3.7	3.4	2.1	0.8
Graduated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	4.0	81.4	0.3
End of year	11.3	9.8	10.1	11.3	9.2	9.4	10.2	8.2	10.6	11.2	9.1	7.0	4.1	9.8
Other	0.6	0.2	0.2	0.3	0.4	0.4	0.3	0.6	1.0	2.7	2.7	2.0	3.7	0.9
Total	18.7	16.5	15.7	17.0	15.4	15.8	16.1	14.6	17.0	24.7	22.1	21.3	94.6	17.9
2005-2009 (average)														
Other MI district	3.0	3.2	2.9	2.4	1.9	1.9	2.0	2.3	2.2	3.7	2.6	2.2	2.2	2.6
Outside of MI	1.3	1.5	1.4	1.4	1.3	1.4	1.5	1.3	1.2	1.5	1.2	0.6	1.9	1.3
Private	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Charter	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.2
Dropout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	3.8	3.5	3.5	4.0	0.9
Graduated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	5.9	76.5	0.4
End of year	8.1	6.5	6.6	6.4	5.9	7.1	5.8	4.6	6.0	9.3	7.0	5.4	5.6	6.7
Other	0.3	0.3	0.2	0.1	0.2	0.1	0.2	0.6	0.8	2.2	1.3	1.0	2.4	0.6
Total	12.9	11.8	11.5	10.5	9.6	10.6	10	9.3	10.8	20.5	16.0	18.6	92.6	12.7
Difference, post less pre														
Other MI district	-1.0	-1.0	-0.4	-1.5	-1.4	-1.9	-0.9	-0.9	-1.0	-1.8	-2.2	-2.1	0.0	-1.3
Outside of MI	-0.9	-0.4	-0.3	-0.4	-0.3	-0.4	-0.7	-0.6	-0.3	-0.8	0.0	0.0	0.7	-0.4
Private	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
Charter	-0.4	-0.1	-0.2	-0.5	-0.6	-0.3	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	-0.2
Dropout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.8	-0.3	0.1	1.9	0.0
Graduated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	-4.8	0.1
End of year	-3.3	-3.3	-3.4	-3.9	-3.3	-2.4	-4.4	-3.6	-4.6	-1.9	-2.2	-1.6	1.6	-3.1
Other	-0.3	0.1	0.0	-0.2	-0.2	-0.3	-0.1	0.0	-0.2	-0.5	-1.4	-1.0	-1.3	-0.3
Total	-5.8	-4.6	-4.2	-6.5	-5.8	-5.2	-6.1	-5.3	-6.2	-4.1	-6.0	-2.7	-2.0	-5.2

NOTE: The “Other” category includes students leaving for home schooling, a juvenile facility, or unknown whereabouts. Shares may not sum to totals because of rounding. See text for more details.

Table 4 Estimation of Equation (1), New Entrants From Other Local MI Districts

$\hat{\gamma}_j$	Total K–12 enrollment, fall 2005	Δ enrollment, 2006–2005	(1)	(2)	(3)	(4)
Climax-Scotts	668	–29	–0.66 (0.23)	–0.47 (0.32)	0.060	0.033
Comstock	2,696	–257	–1.27 (0.25)	–1.07 (0.27)	1.018	0.822
Galesburg-Augusta	1,231	–6	–0.88 (0.25)	–1.02 (0.36)	0.016	0.094
Gull Lake	2,935	–54	–0.13 (0.14)	–0.15 (0.15)	0.022	0.019
Parchment	1,971	–120	–0.07 (0.19)	–0.24 (0.25)	0.026	0.091
Portage	9,028	–217	0.13 (0.11)	0.06 (0.13)	–0.088	–0.043
Schoolcraft	1,201	12	–0.52 (0.51)	–0.78 (0.51)	–0.019	–0.025
Vicksburg	2,768	–49	0.94 (0.38)	0.75 (0.39)	–0.144	–0.112
KPS	10,212	1,016			0.891	0.879
Exclude K?			No	Yes		
N			169	156		
R ²			0.840	0.802		

NOTE: Estimates shown in columns 1 and 2 are for γ_j from OLS estimation of Equation (1) in the text for the eight districts in the KRESA besides KPS. Standard errors in parentheses are robust to heteroskedasticity. All regressions include grade-level fixed effects. Enrollment totals are from CEPI. The numbers in columns 3 and 4 represent the product of the estimates in column 1 (or column 2) and the 2006–2005 change in enrollment as a share of the total new entrants into KPS from other Michigan districts in 2006.

Table 5 Estimation of Equation (1), Exits to Other Local MI Districts

	(1)			(2)	(3)	(4)
	$\hat{\gamma}_j$	$\hat{\delta}_j$	$\hat{\delta}_j - \hat{\gamma}_j$	$\hat{\gamma}_j = \hat{\delta}_j$		
Climax-Scotts	0.95 (0.46)	0.67 (0.53)	-0.28 (0.58)	0.32 (0.48)	0.047	0.120
Comstock	2.28 (0.30)	0.34 (0.21)	-1.94 (0.33)	0.59 (0.22)	0.999	0.194
Galesburg-Augusta	0.79 (0.37)	-0.08 (0.38)	-0.87 (0.45)	0.03 (0.34)	0.008	-0.008
Gull Lake	0.43 (0.26)	-0.41 (0.26)	-0.85 (0.29)	-0.20 (0.26)	0.040	-0.052
Parchment	0.21 (0.35)	-0.14 (0.29)	-0.35 (0.41)	0.26 (0.28)	0.043	-0.064
Portage	-0.49 (0.19)	0.37 (0.20)	0.86 (0.25)	0.31 (0.19)	-0.181	0.248
Schoolcraft	0.91 (0.78)	0.56 (0.56)	-0.35 (0.87)	0.50 (0.56)	-0.019	0.155
Vicksburg	-1.65 (0.58)	-0.15 (0.35)	1.50 (0.56)	-0.35 (0.35)	-0.138	-0.062
					0.799	0.531
N		156		156		
R ²		0.629		0.569		

NOTE: Estimates shown in supercolumn (1) are for γ_j and δ_j from OLS estimation of Equation (1) using the sum of students exiting from KPS to other Michigan school districts and those exiting between years as the dependent variable. Estimates in column 2 are based on the imposition that $\gamma_j = \delta_j$, although this is rejected in the data. In both cases, the sample includes grades K–11. Standard errors in parentheses are robust to heteroskedasticity. All regressions include grade-level fixed effects. The numbers in column 3 (column 4) represent the product of the $\hat{\gamma}_j$ ($\hat{\delta}_j$) estimates from supercolumn 1 and the change in enrollment between 2006 and 2005 (2010 and 2006) as a share of the total exiting students from KPS (to Michigan school districts and those exiting between years) in those periods.

Table 6 Multinomial Logit Estimation of Equation (2), Choice of School for New Entrants

A: Elementary	Lunch ²⁰⁰³⁻²⁰⁰⁵	MEAP ²⁰⁰³⁻²⁰⁰⁵	P ²⁰⁰³⁻²⁰⁰⁵	P ²⁰⁰⁶	P ²⁰⁰⁷⁻²⁰⁰⁸	dP ²⁰⁰⁶	dP ²⁰⁰⁷⁻²⁰⁰⁸
Arcadia	0.649	-0.077	0.040	0.041	0.042	0.0001	0.0024
Edison	0.927	-0.515	0.063	0.049	0.069	-0.0074	0.0106*
Greenwood	0.663	-0.406	0.029	0.023	0.029	-0.0058	0.0001
Indian Prairie	0.286	0.478	0.050	0.051	0.051	-0.0025	-0.0013
King-Westwood	0.420	-0.118	0.069	0.078	0.085	0.0028	0.0129**
Lincoln	0.801	-0.696	0.073	0.092	0.074	0.0249**	0.0053
Milwood	0.702	-0.561	0.084	0.090	0.091	0.0084	0.0110
Northeastern	0.823	-0.775	0.065	0.056	0.058	-0.0032	-0.0036
Northglade	0.759	-1.288	0.056	0.046	0.029	-0.0062	-0.0295**
Parkwood-Upjohn	0.541	-0.540	0.068	0.082	0.084	0.0084	0.0130**
Prairie Ridge	0.566	-0.046	0.062	0.069	0.081	0.0009	0.0167**
Spring Valley	0.713	-0.788	0.052	0.049	0.038	-0.0005	-0.0139**
Washington	0.884	-0.357	0.061	0.056	0.066	0.0007	0.0090
Winchell	0.362	0.178	0.062	0.063	0.068	-0.0102	-0.0017
Woods Lake	0.812	-1.013	0.106	0.095	0.069	-0.0094	-0.0360**
Woodward	0.709	-0.380	0.063	0.058	0.066	-0.0010	0.0050
B: Middle							
Hillside	0.533	-0.156	0.301	0.266	0.260	-0.0363	-0.0617*
Maple	0.692	-0.581	0.341	0.490	0.378	0.1323**	0.0437
Milwood	0.754	-0.792	0.352	0.245	0.363	-0.0960**	0.0179
C: High							
Central	0.442	—	0.409	0.490	0.507	0.0757**	0.0940**
Loy Norrix	0.520	—	0.488	0.455	0.464	-0.0337	-0.0140
Phoenix	0.717	—	0.103	0.056	0.030	-0.0419**	-0.0799**

NOTE: The first column lists the 16 elementary, 3 middle, and 3 high schools in KPS during the sample period of 2003–2008. Two elementary schools, Greenwood and Indian Prairie, offer grades K–3 only. The second and third columns show the fraction of students on federal lunch programs and standardized MEAP scores at each school, averaged over the 2003–2005 period; see note 36 in the text for the construction of these variables. The next three columns show the empirical distribution of the choice of school for the years superscripted; within each panel, the numbers in each column (approximately) sum to one. The last two columns show marginal changes in probability between 2003–2005 and the specified periods, controlling for grade, gender, ethnicity, and lunch status. Asterisks indicate statistical significance (* $p < 0.10$, ** $p < 0.05$).

Table 7 Delayed Sorting: Choice of School for New Entrants and One Year Later

	Entered 2003–2004			Entered 2006			Entered 2007–2008		
A: Elementary	Same school	Diff. school	Left KPS	Same school	Diff. school	Left KPS	Same school	Diff. school	Left KPS
Arcadia	0.641	0.087	0.272	0.677	0.108	0.215	0.676	0.148	0.176
Edison	0.534	0.124	0.342	0.539	0.179	0.282	0.580	0.188	0.232
Greenwood	0.500	0.278	0.222	0.613	0.161	0.226	0.543	0.157	0.300
Indian Prairie	0.677	0.062	0.262	0.766	0.065	0.169	0.768	0.088	0.144
King-Westwood	0.579	0.129	0.292	0.807	0.065	0.129	0.760	0.086	0.154
Lincoln	0.744	0.033	0.222	0.582	0.158	0.260	0.657	0.192	0.152
Milwood	0.623	0.141	0.236	0.643	0.126	0.231	0.579	0.197	0.224
Northeastern	0.533	0.127	0.340	0.629	0.112	0.258	0.617	0.169	0.214
Northglade	0.611	0.139	0.250	0.722	0.153	0.125	0.803	0.079	0.118
Parkwood-Upjohn	0.587	0.169	0.244	0.723	0.108	0.169	0.638	0.106	0.257
Prairie Ridge	0.649	0.113	0.238	0.651	0.083	0.266	0.687	0.103	0.210
Spring Valley	0.712	0.072	0.216	0.795	0.115	0.090	0.765	0.082	0.153
Washington	0.623	0.158	0.219	0.538	0.238	0.225	0.575	0.156	0.270
Winchell	0.707	0.076	0.217	0.920	0.010	0.070	0.833	0.061	0.106
Woods Lake	0.572	0.106	0.322	0.640	0.120	0.240	0.669	0.072	0.260
Woodward	0.640	0.116	0.245	0.663	0.120	0.217	0.616	0.215	0.169
Total	0.622	0.116	0.262	0.683	0.116	0.201	0.672	0.132	0.196
B: Middle									
Hillside	0.508	0.082	0.410	0.667	0.033	0.300	0.826	0.000	0.174
Maple	0.525	0.065	0.410	0.717	0.022	0.261	0.679	0.000	0.321
Milwood	0.453	0.063	0.484	0.722	0.056	0.222	0.556	0.056	0.389
Total	0.484	0.068	0.447	0.705	0.036	0.259	0.696	0.015	0.290

NOTE: The first column lists the 16 elementary, 3 middle, and 3 high schools in KPS during the sample period of 2003–2008. The three columns within each panel show the fraction of students who entered each school as a new KPS student (row) who at the count day of the following year: were at the same school (first column), had switched to a different school (second column), or had left KPS (third column). Two elementary schools, Greenwood and Indian Prairie, offer grades K–3 only; these schools show transitions for grades K–2 only. Similarly, schools that range only through 5th grade for a given year do not include 5th graders in the transitions above. Finally, the middle school transitions in the last panel are for entrants in 2007 only, as a new middle school opened up in 2009, and several students were redistricted that year.

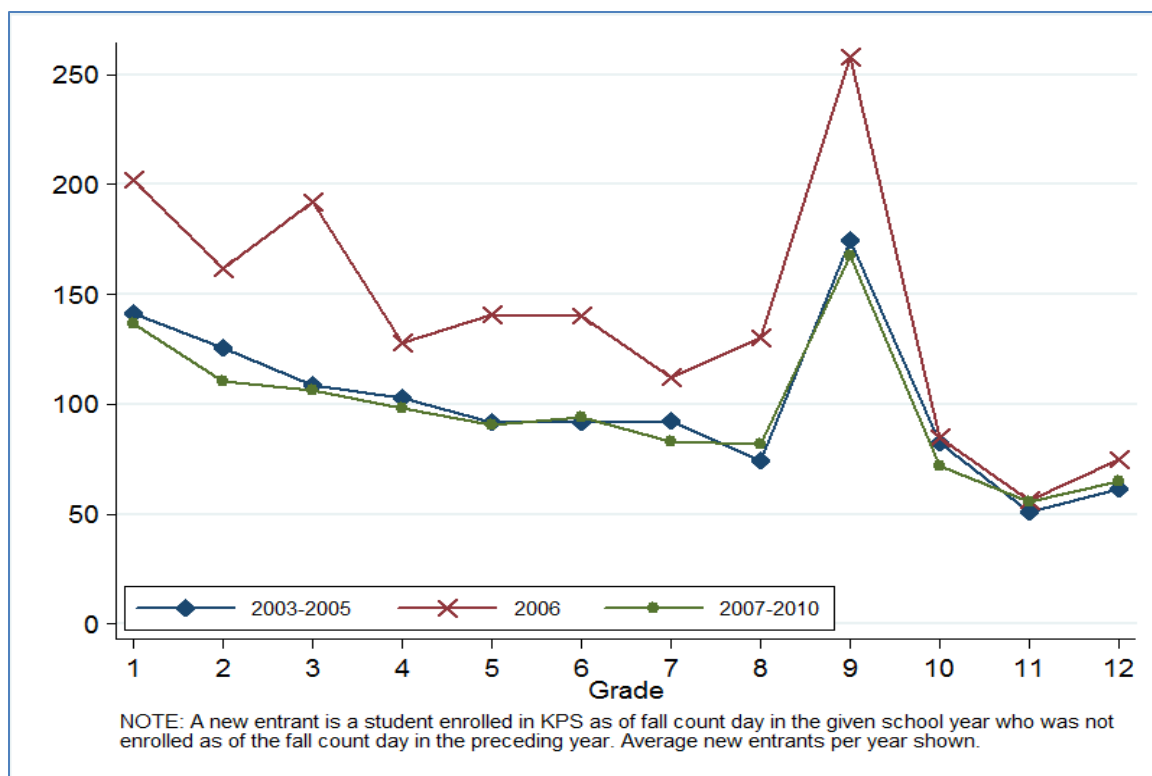


Figure 1 New Fall Student Entrants to KPS, by Grade and Year Interval

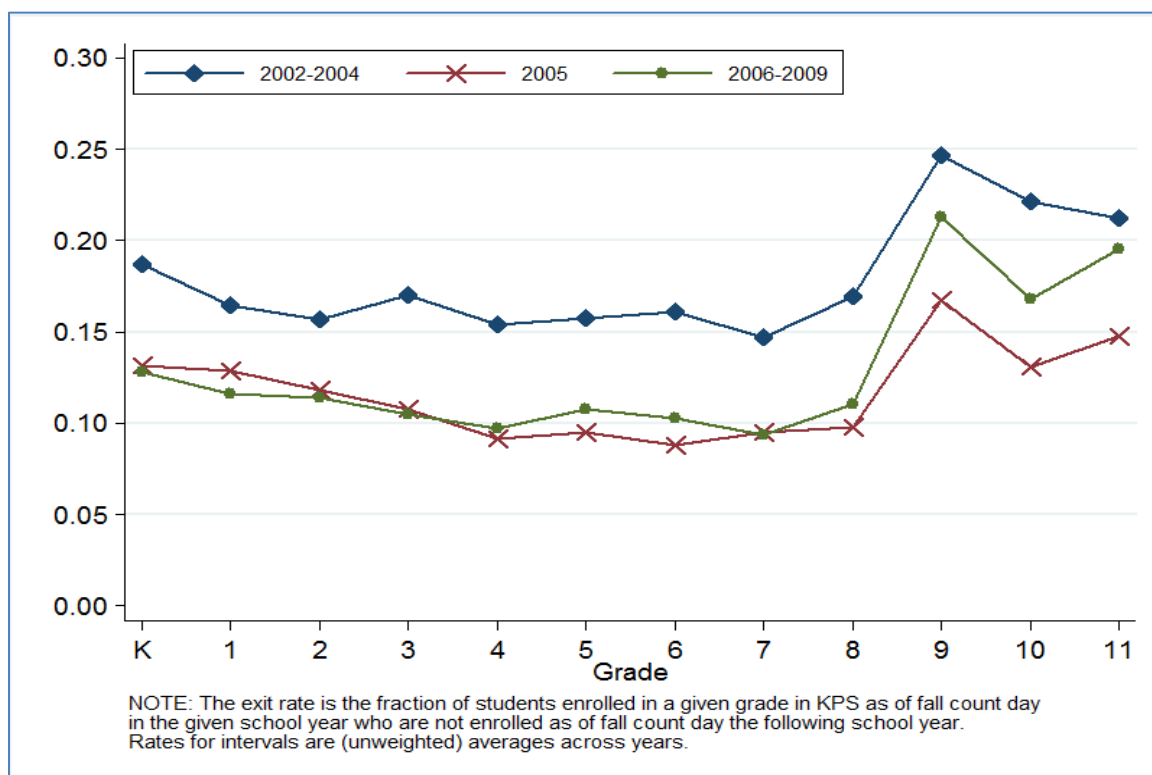


Figure 2 Student Exit Rates from KPS, by Grade and Year Interval

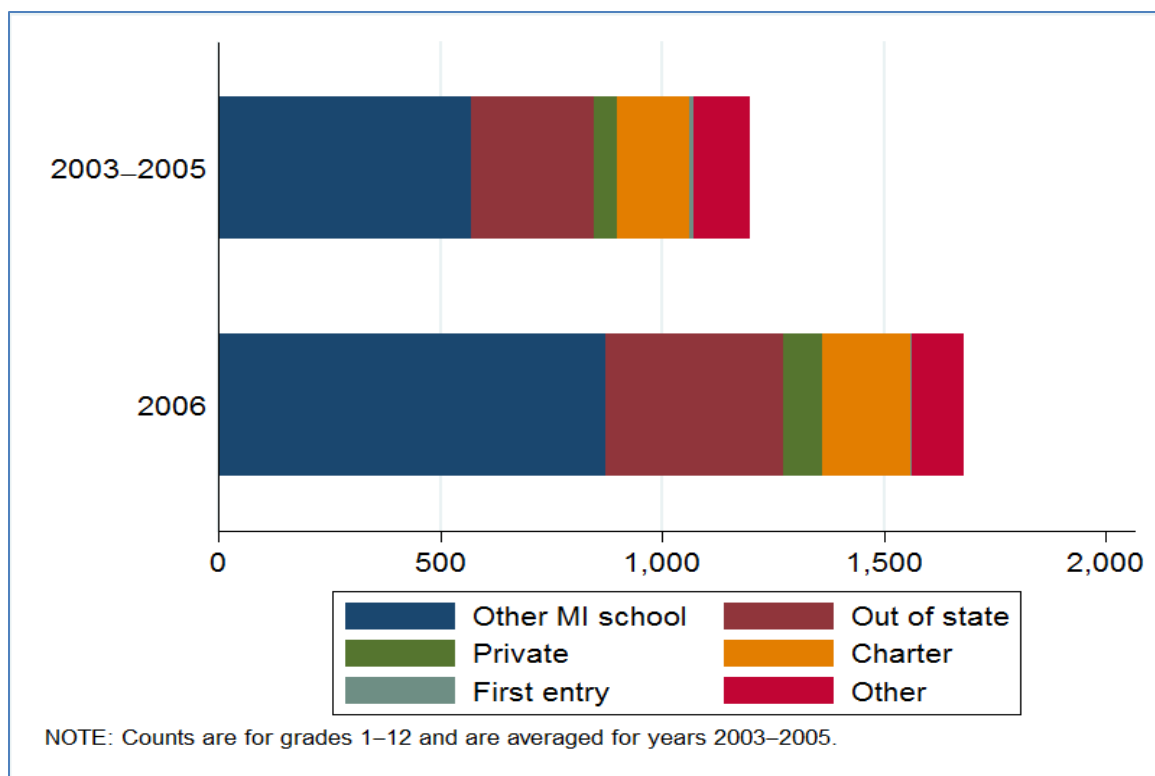


Figure 3 Entry Counts to KPS, by Reason

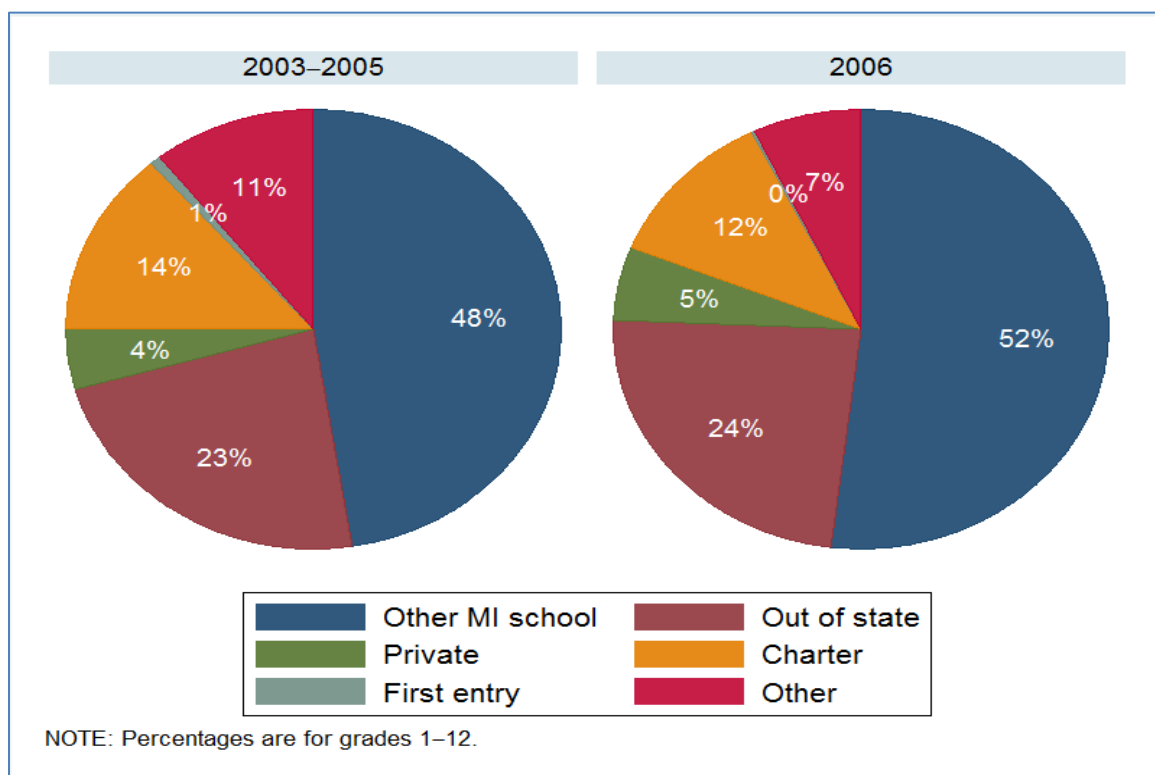


Figure 4 Composition of New Entrants to KPS

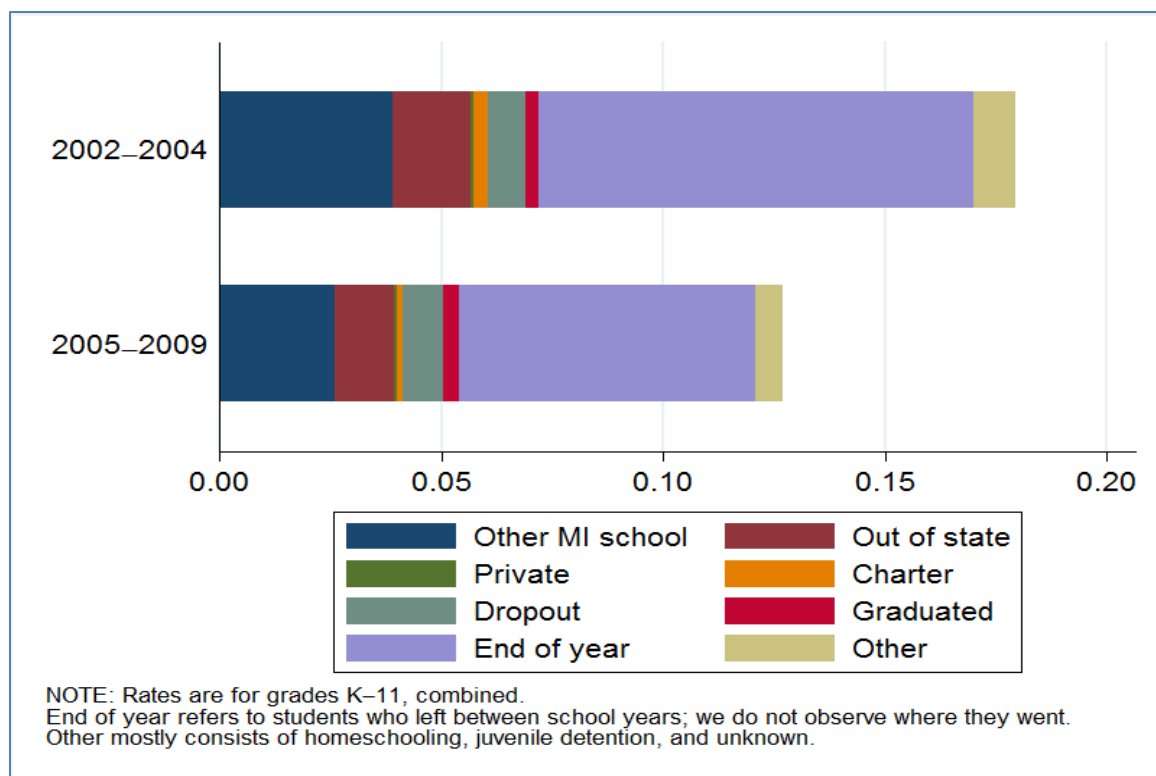


Figure 5 Exit Rates from KPS, by Reason

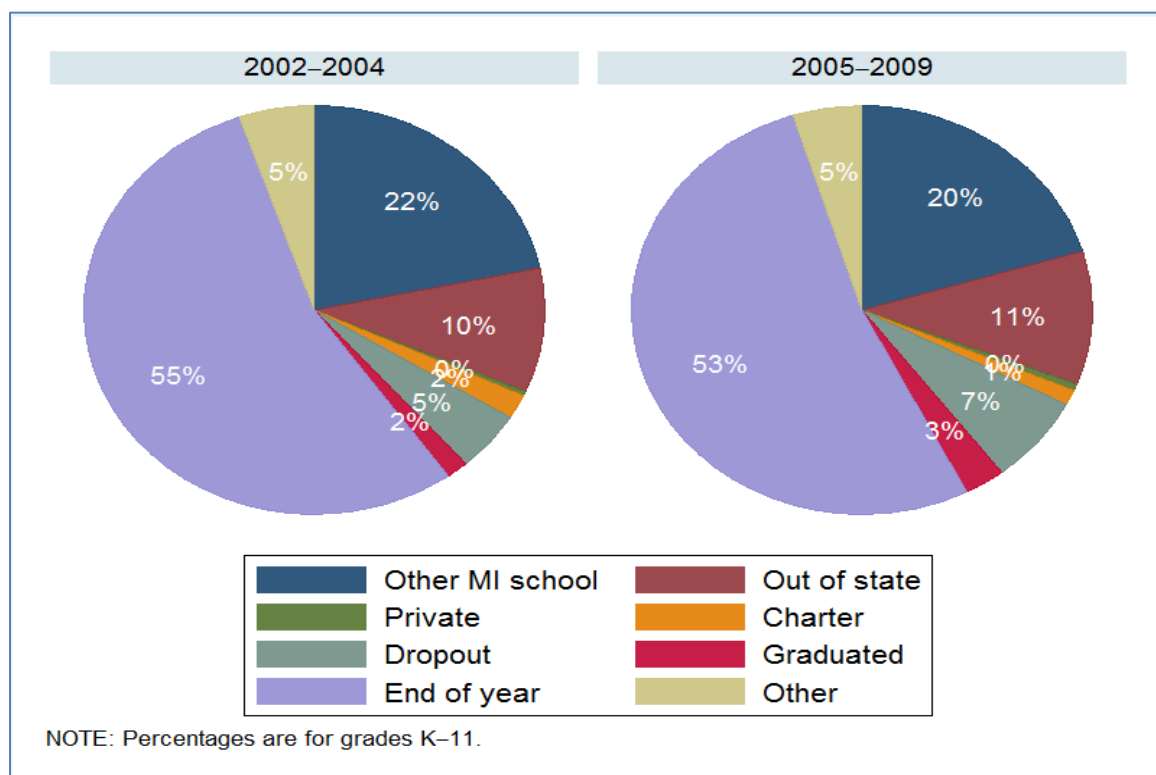
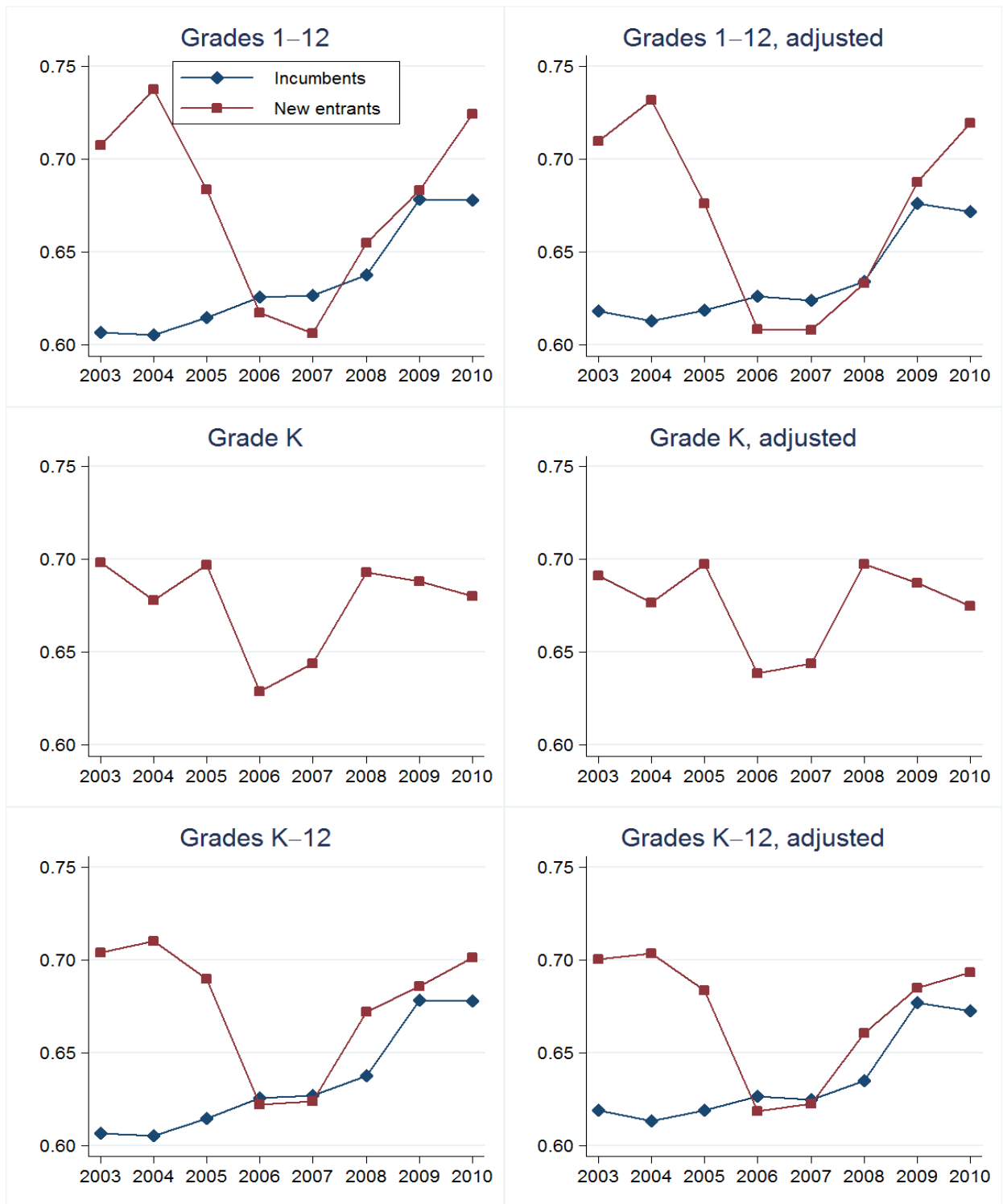
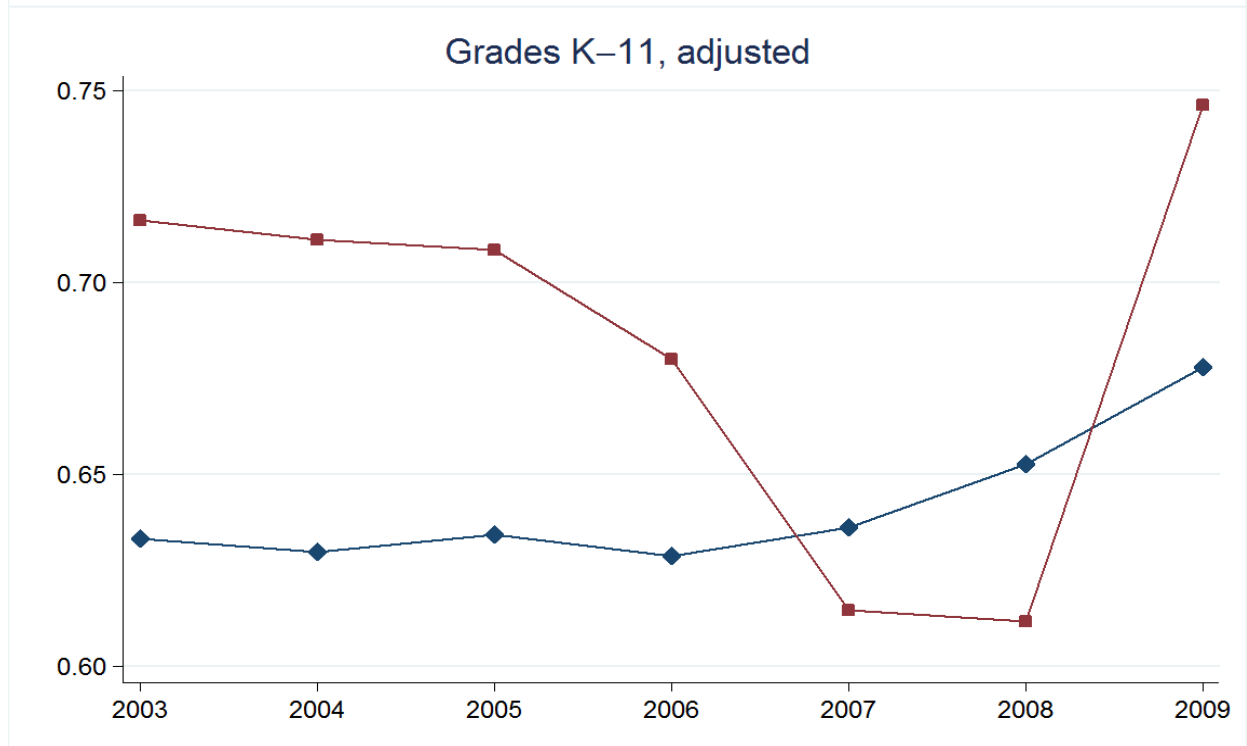
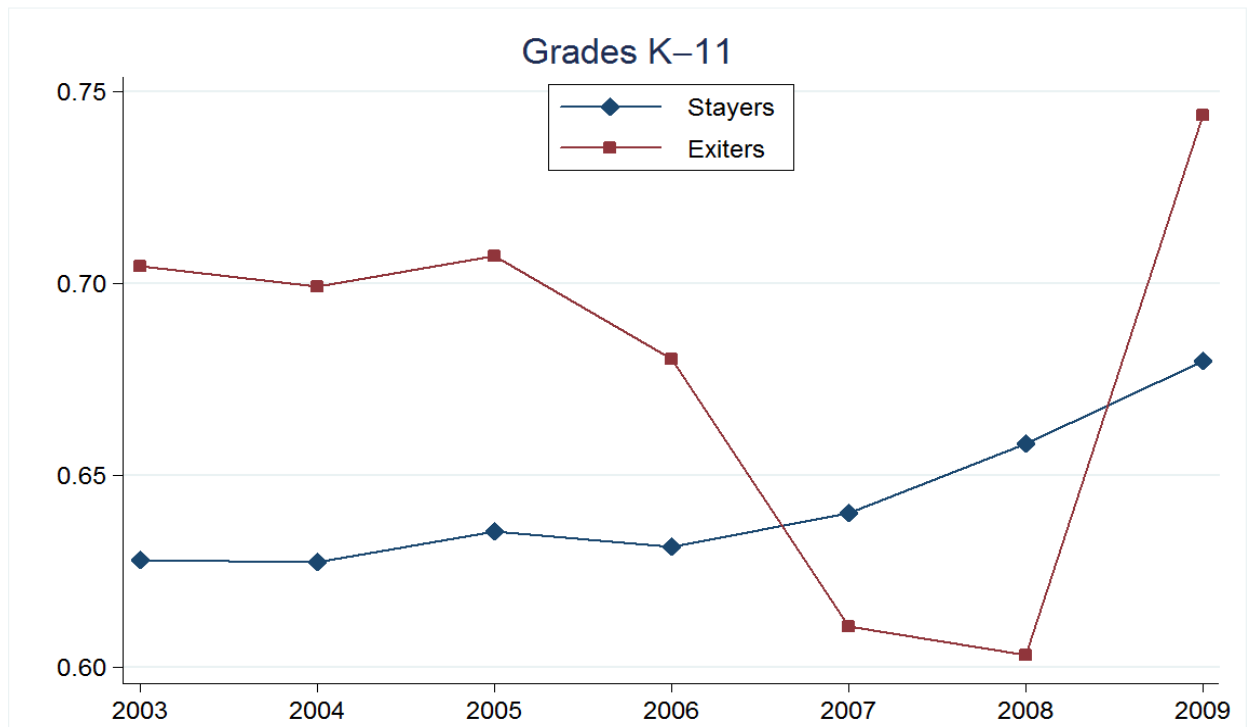


Figure 6 Composition of Exits from KPS



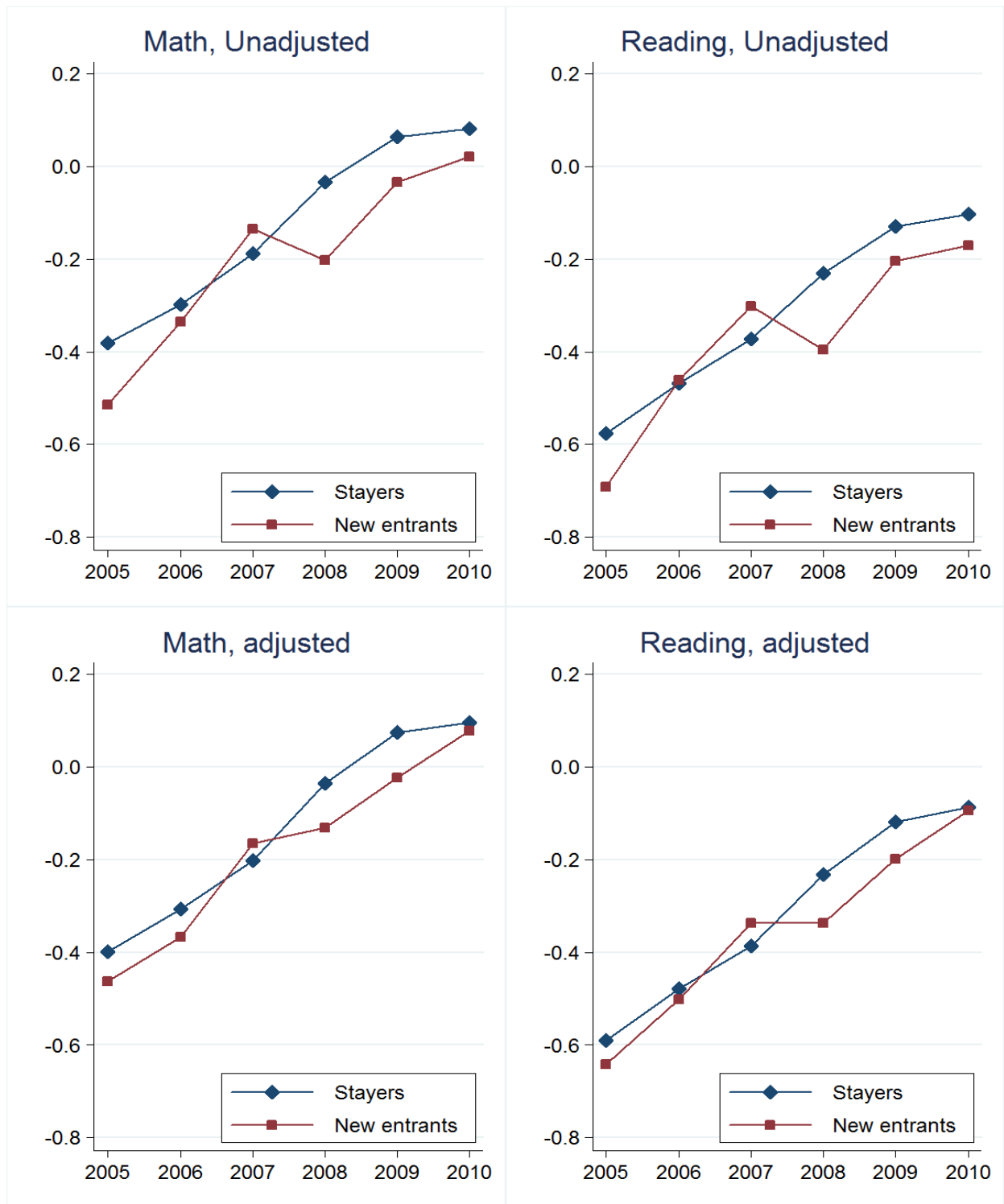
NOTE: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year. The second column adjusts for changes in grade, sex, and ethnicity.

Figure 7A Free and Reduced-Price Lunch Status, by Grade Range, Entry Status, and Year



NOTE: An exiter is a student enrolled in KPS as of Fall count day in the given school year who was not enrolled as of the Fall count day in the following year. The second graph adjusts for changes in grade, sex, and ethnicity.

Figure 7B Free and Reduced-Price Lunch Status, by Grade Range, Exit Status, and Year



NOTE: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year. Scores are in standard deviation units; the bottom row adjusts scores for changes in grade, sex, ethnicity, and lunch status.

Figure 8 Standardized MEAP Scores of KPS Students, by Entry Status and Year



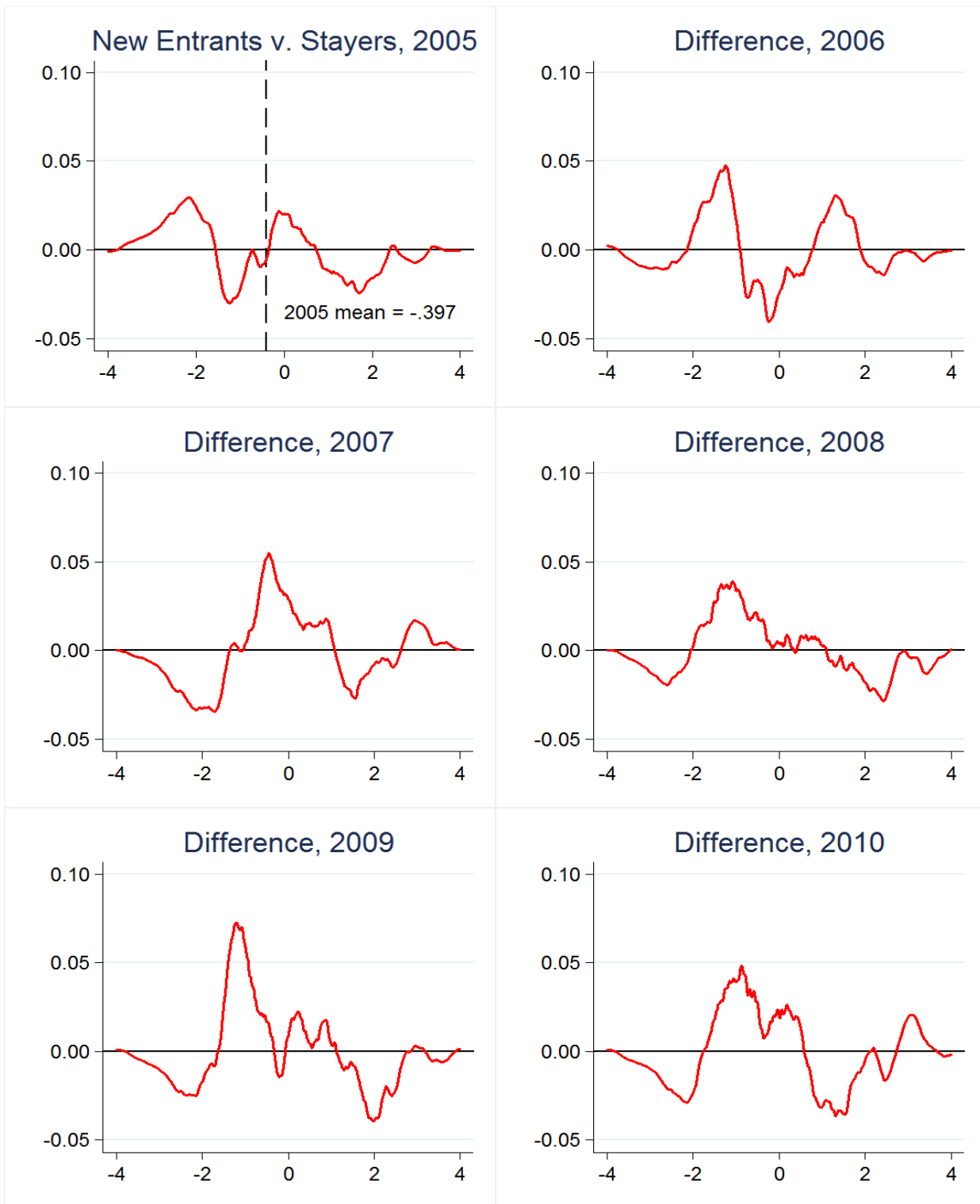
NOTE: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year. Scores are in standard deviation units. Densities use the Epanechnikov kernel with optimal plug-in bandwidth. The top left panel shows the difference in density between new entrants and stayers in 2005. The other panels show the change from the 2005 difference in density.

Figure 9 Math MEAP Score Density Differences, KPS Students, by Entry Status and Year



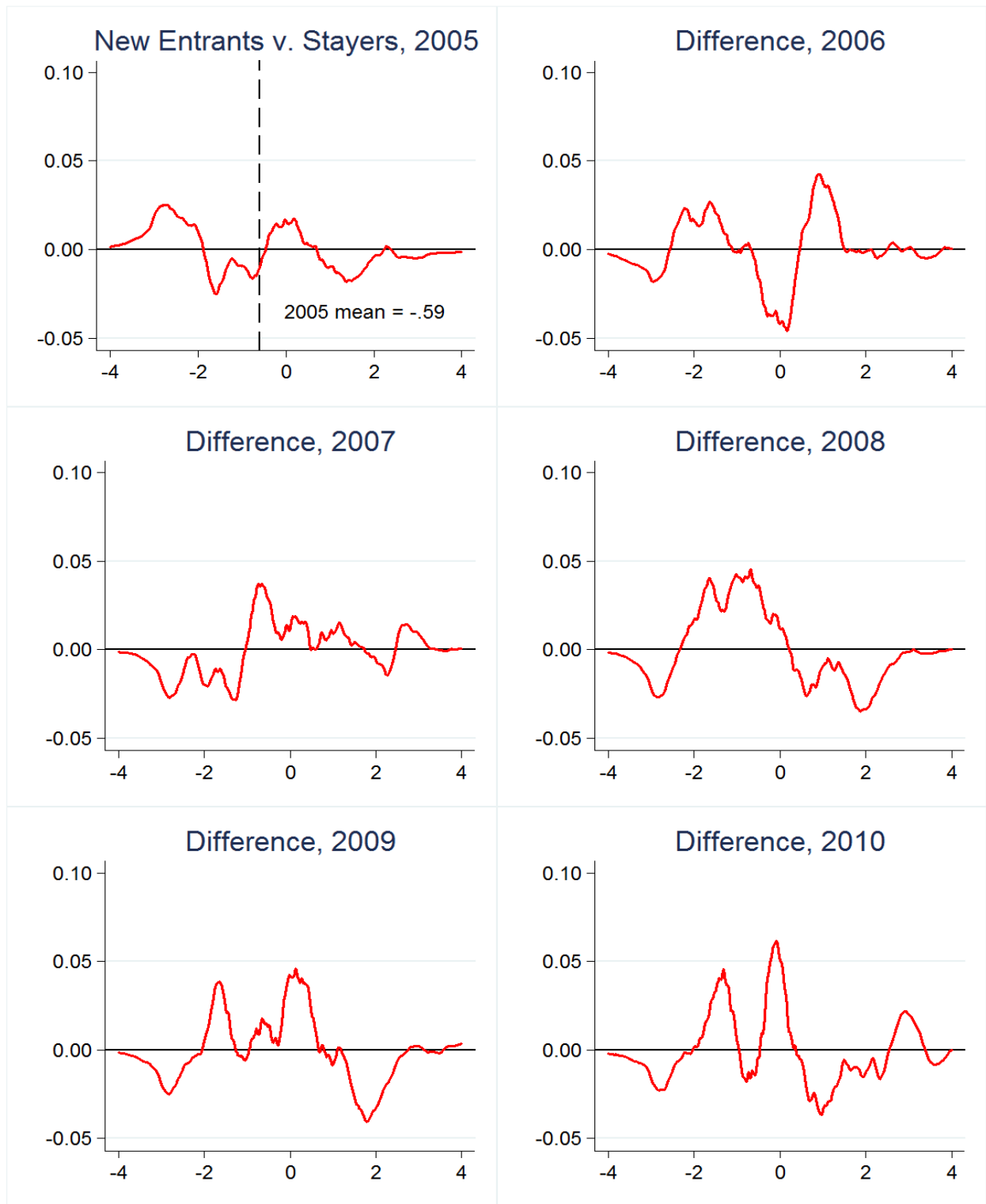
Note: A new entrant is a student enrolled in KPS as of fall count day in the given school year who was not enrolled as of the fall count day in the preceding year. Scores are in standard deviation units. Densities use the Epanechnikov kernel with optimal plug-in bandwidth. The top left panel shows the difference in density between new entrants and stayers in 2005. The other panels show the change from the 2005 difference in density.

Figure 10 Reading MEAP Score Density Differences, KPS Students, by Entry Status and Year



NOTE: See notes to Figure 9. The densities here have been reweighted using the DFL procedure on the basis of sex, race, grade, and lunch status to reflect the composition in 2005.

Figure 11 Reweighted Math MEAP Score Density Differences, by Entry Status and Year



NOTE: See notes to Figure 9. The densities here have been reweighted using the DFL procedure on the basis of sex, race, grade, and lunch status to reflect the composition in 2005.

Figure 12 Reweighted Reading MEAP Score Density Differences, by Entry Status and Year