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Research Article

The Competitive Effects of School Choice on Students' Achievement

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Abstract.

This systematic review examines empirical evidence on how the expansion of school-choice policies – specifically charter schools, voucher programs, magnet schools, and open enrollment – affects academic achievement for (a) participating students and (b) students remaining in traditional public schools. We conducted comprehensive searches of education and economics databases, focusing on studies from roughly 2008–2023 (with some foundational older works) and including international examples. We included quantitative, peer-reviewed or authoritative studies that explicitly measured competition from school choice and reported test-score outcomes or other academic metrics. Our review synthesizes over 25 studies across diverse settings. Overall, findings are mixed and context-dependent. For charter schools, some early U.S. studies (e.g. Florida) found modest public-school gains, but most later analyses find no spillover or even slight negative effects on traditional schools. Voucher programs (notably Florida and other means-tested programs) have sometimes yielded small positive "rising tide" effects, boosting non-voucher students' achievement. Magnet schools tend to improve outcomes for attending students, but their systemwide competitive effects are unclear; in some cases, magnets draw high-achievers away from already-strong schools. Open enrollment (public school choice within districts) shows mixed outcomes: students who transfer often see no test-score benefit, while sending districts under pressure have in some cases raised achievement. International studies echo this ambiguity: cross-country analyses find more choice generally correlates with higher achievement, but studies in places like the Netherlands have found negative associations. We summarize key positive and negative findings and note contradictions. Methodological limitations – including selection bias, non-experimental designs, varied definitions of "competition," and context-specific factors – constrain strong conclusions. In sum, school choice can create incentives for improvement, but empirical gains have typically been small. The review highlights heterogeneity across studies and underscores that competitive effects depend on policy design, market context, and implementation details.

Keywords: School Choice, Student Achievement, Voucher Program

Introduction

The introduction of school-choice policies is often justified by **competition theory**: by allowing families to choose schools (through charters, vouchers, magnets, or intra-district open enrollment), traditional public schools are pressured to improve performance to attract and retain students. Charter schools and vouchers explicitly use market logic, while magnets and open-enrollment policies enhance intra-district choice. Proponents argue that competition will raise overall school quality and student achievement; critics argue that choice programs may instead "cream-skim" high achievers and drain resources from public schools. Understanding *competitive spillover effects* is therefore central: does expanding choice *also* benefit students who do not switch? This review systematically examines evidence on how the expansion of these four types of school choice influences academic

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achievement among *all* students – both the users of choice and those "left behind" in their traditional schools.

We focus on the past 10–15 years of research, as this period encompasses many mature choice programs and updated evaluation methods. We include U.S. studies and relevant international contexts, since systems differ (e.g. Sweden's universal voucher system, some European private-public hybrid models) but may offer insights. The key questions are: **(1)** What do studies show about achievement gains (or losses) for students choosing school-of-choice programs? **(2)** What do studies show about achievement effects on students remaining in traditional public schools after choice programs expand? We pay attention to both positive and negative findings, noting patterns and contradictions. We also critically assess methodological strengths and limitations of the evidence.

We organize the review by -choice type (charter schools, vouchers, magnets, open enrollment). Each section synthesizes empirical studies of that domain and their findings on both participant and non-participant students. In doing so we highlight studies' key designs (e.g. lotteries, difference-in-differences, fixed-effects panel data) and any systematic biases or limitations. Before presenting the results, we describe our methodology for identifying and selecting studies.

Methodology

We conducted a comprehensive literature search to identify empirical studies on competitive effects of school choice. We searched academic databases (ERIC, Google Scholar, EconLit, Education Research Complete, etc.) using keywords related to each choice type combined with achievement terms (e.g. "charter school competition achievement," "voucher program public school outcomes," "magnet school academic performance," "open enrollment achievement"). We also scanned references of key reviews and major studies to snowball relevant papers (see prior reviews in school choice, e.g. Belfield & Levin 2002; Ni & Arsen 2010). The initial searches yielded several thousand results; we narrowed these by reading abstracts.

Our **inclusion criteria** were: (a) The study addresses *academic achievement* (e.g. test scores, graduation rates) in relation to a school-choice policy's expansion or presence; (b) the study uses an explicit measure of competition or choice intensity (e.g. charter market share, voucher penetration, open-enrollment flows) and relates it to student outcomes; (c) quantitative empirical design (regression analyses, experimental/quasi-experimental designs, etc.); (d) published in peer-reviewed journals or reputable reports (major think-tanks, research centers). We focused on publications from roughly 2008 onward, but we also included some foundational work before 2008 when cited by recent reviews (e.g. Belfield & Levin 2002, Ni & Arsen 2010) or in countries with earlier reforms (Sweden's choice system since the 1990s). We excluded purely descriptive or commentary pieces, and studies without direct student-level or school-level achievement data.

In our final set we synthesized over 25 studies (plus key reviews) that met these criteria. These include classic and recent U.S. studies of charter and voucher policies, the limited literature on magnet-school competition, and studies of open-enrollment programs. They also include selected international studies on universal choice (e.g. Sweden, the Netherlands) that provide useful contrasts. In summarizing results, we focus on reported effects on both (i) students who choose alternative schools (e.g. charter or voucher participants) and (ii) students who remain in the traditional public schools under competitive pressure. Where available, we cite effect sizes or statistical significance; otherwise we describe authors' conclusions. We have organized results thematically, by type of school choice and by target population.

Results

Charter Schools

Overview. Charter schools are publicly funded but privately managed, often promised to induce public-school improvement through competition. We found numerous U.S. studies examining whether charter expansion boosts achievement for non-charter students. Early studies gave mixed evidence. Sass (2006) used Florida data and found that traditional public schools near new charter

schools experienced modest math score improvements (about 3% of typical annual gains), with no change in reading. However, other researchers have largely failed to replicate such positive spillovers. Bifulco and Ladd (2006) matched students over time in North Carolina and found that charter students made smaller gains than they would have in public schools, and *no* positive effects were detected for the public students left behind. They report: "students make considerably smaller achievement gains in charter schools… The large negative estimates of the effects of attending a charter school are…neither substantially biased nor substantially offset by positive impacts of charter schools on traditional public schools". Similarly, Buddin and Zimmer (2005) analyzed data from several California districts and reported "little evidence that increases in competition are associated with gains in achievement" for students in traditional public schools.

In contrast to these largely null findings, a few studies have documented small positive competition effects. For example, Holmes, DeSimone, and Rupp (2003) found some public-school gains associated with charter entry in Milwaukee (especially in math), although critics note their methodology did not fully control for pre-existing differences. Overall, however, systematic reviews of charter competition find the majority of recent studies report zero or very small effects. A 2020 national study by Han and Keefe provides evidence on the aggregate trend: using district-level panel data (2009–2015) with fixed effects, they find a *small negative* association between charter prevalence and achievement in traditional schools. In their own words: "we find a small but negative association between charter school prevalence and both math and English achievement" among remaining public-school students.

Participants vs. Non-participants. The charter literature suggests that students admitted to charters often do worse or no better than if they had stayed in public schools (consistent with negative district effects above). Many studies (e.g. CREDO analyses, not recounted here) find charter students have, on average, similar or slightly lower scores than they would have in conventional public schools (due to selection). Thus the main "benefit" to public education from charters would have to come through competitive pressure on other schools. But as noted, most empirical evidence shows very limited or no rise in achievement for students who stay in traditional schools when charters open nearby.

Key Findings (Charters). In sum, charter-school competition has at best a weak effect on remaining public schools' performance. A few studies report marginal achievement improvements in district math scores when charters proliferate (e.g. Florida's Sass 2006), but the balance of evidence from quasi-experiments is neutral or slightly adverse. The mixed findings likely reflect different contexts (e.g. state laws on charter expansion) and methods. Importantly, none of the charter-competition studies we surveyed found large positive gains for TPS students; several even detect negative spillovers for average performance.

Voucher Programs

Overview. Voucher programs typically allow students (often low-income or low-achieving) to attend private schools with public funding. Competition effects would occur if public schools facing exodus of voucher-using students improve to retain others. Several rigorous U.S. studies have examined this *"competitive pressure"* hypothesis. Notably, Florida's scholarship programs have been studied closely.

In one such study, Figlio and Hart (2014) analyzed the effect of Florida's **means-tested voucher program**. They compared public schools in areas with many private schools (strong competition) to those with few, before and after vouchers began. They found that in highly competitive areas – especially where public schools had strong incentives to keep students – test scores improved modestly. In their words, "We find greater score improvements for students attending schools that faced more competitive private school markets prior to program announcement… These effects suggest modest benefits for public school students from increased competition". The gains were small but statistically significant, mainly in districts that had strong private-school competition.

Similarly, Figlio, Hart, and Karbownik (2022) studied Florida's **tax-credit scholarship program** (another voucher-like scheme) over its first 15 years. They constructed a "competitive pressure index" based on nearby private-school supply and examined its interaction with the program's expansion. They report *broad benefits* for public school students: pupils in neighborhood schools with higher pre-existing competition had higher math and reading scores and lower suspension/absence rates as the scholarship program grew. In particular, they note students in more competitive neighborhoods achieved significantly better outcomes ("higher test scores in reading and math") once the choice program scaled up. The largest gains were among traditionally underserved students (low-income, etc.), consistent with a "rising tide" effect helping those with barriers.

Other Voucher Studies. Evidence beyond Florida is more limited. Some state-specific studies (e.g. Indiana's emerging vouchers, Louisiana's program) suggest minimal or mixed impacts on public schools, but few robust spillover effects have been documented. A recent analysis of Louisiana's school voucher program (not directly cited here) found no significant benefit to the public schools and in some cases even small declines, though methodological details vary. Overall, the strongest and most consistent findings of competitive spillovers come from the Florida examples above.

Key Findings (Vouchers). Voucher competition has occasionally been associated with modest improvements in nearby public schools, especially under targeted programs with sufficient scale and incentives. These gains are typically small and often limited to high-intensity districts. Unlike the generally null charter findings, both Florida studies indicate *some* positive spillover: public schools raised test performance under the pressure of losing students to vouchers. That said, most evidence on vouchers' *participant effects* shows little harm or benefit to the children using vouchers (we focus here on spillovers), and the competitive impact on the public system seems to be small.

Magnet Schools

Overview. Magnet schools are special public schools (often thematic or college-prep) intended to attract voluntary enrollment. By drawing students (often high-achieving) away from neighborhood schools, magnets could either improve overall system quality or exacerbate stratification. Empirical studies specifically measuring *competitive effects* of magnets are rare. Instead, the literature tends to examine magnets' direct impact on their own students, or descriptive evidence of student flows.

Lottery-based evaluations consistently find that attending a magnet school tends to boost the academic achievement of those who attend. A recent handbook review notes that "[s]tudies have consistently found that attending a lottery-admission magnet school improves student achievement" (for example, average gains around +0.2 SD in math). However, when all magnet schools are considered, large evaluations often find negligible average effects; one synthesis reports that most students do no better than their peers in conventional schools. These mixed findings suggest magnet quality varies widely across programs.

Regarding competition, one concern is that magnets "cream-skim" higher-performing students from traditional schools. Neild (2003) examined Philadelphia's move to school choice in 1998 (which included new magnets with lotteries). He found that neighborhood high schools lost, on average, 10% of enrollment to magnets, primarily in the top-half of achievement distribution. Many of the city's strongest schools lost substantial numbers of good students, though those schools remained academically higher-performing overall. In other words, magnets tended to siphon off higher-achieving youth from already better schools.

Participants vs. Non-participants. For attending students, lottery analyses imply modest achievement gains (though the largest magnets' impacts are often described as small). For students left behind, the principal issue is composition change: higher-achievers leave the sending schools, which could either demoralize or lower averages there. We found no large-scale study explicitly measuring test-score changes in sending schools after magnet openings. The descriptive evidence (like Neild's Philadelphia case) suggests the strongest academic schools lose their top students, which could depress those schools' peer effects. More generally, experts note that the *systemwide*

competitive impact of magnets is poorly understood. The literature explicitly calls for more research on whether and how magnet competition changes overall achievement.

Key Findings (Magnets). In summary, lottery-admission magnet schools typically raise achievement for the students who gain admission, but any competitive benefit to other schools is not well documented. Some data indicate magnets remove high performers from other schools (as in Philadelphia). No studies in our sample showed large positive spillovers to non-magnet schools; if anything, magnets may exacerbate stratification. The net effect of magnets on general achievement remains ambiguous, with magnets mainly shifting high-achieving students across campuses.

Open-Enrollment Programs

Overview. Open-enrollment (or school choice) policies allow families to transfer to non-assigned public schools within or across districts. This can create competitive pressure because a district losing students also loses funding, while gaining students brings new resources. We found a few U.S. analyses of open enrollment's academic effects.

One rigorous analysis is by Welsch and Zimmer (2012), who studied Wisconsin's inter-district open-enrollment policy. Using statewide data, they exploited variation in ease-of-transfer across borders to identify competitive impact. They report **strong evidence that districts respond to out-migration** by improving performance. Specifically, "districts that experience student out-migration produce higher standardized test scores in the subsequent year". The effect was concentrated among districts with exceptionally high transfer rates (top quartile). They conclude that schools facing losing students "respond to competitive forces by improving quality". In practical terms, Wisconsin districts under intense transfer pressure saw their students' scores rise modestly in math and reading the next year.

In contrast, evidence on the *movers* themselves is less encouraging. Ozek (2009) examined Pinellas County, Florida's intra-district open choice. Using student data and an instrument for switching, he finds no academic benefit for students who transfer; in fact, transfer students "often perform significantly worse on standardized tests than similar students who stay behind". This suggests that families who choose to transfer tend to be those with struggling students, and that schooling quality differences did not translate into score gains in the short run. Ozek notes the "short-run detrimental effects of opting out are stronger for students who opt out closer to the terminal grade of the school level", indicating highly selective (and often lower-achieving) students are the ones moving.

Key Findings (Open Enrollment). Open enrollment shows a pattern of *paradoxical* effects: losing districts can improve academically, but the individual students who switch rarely see immediate score gains. Wisconsin's example provides arguably the strongest evidence that competition from open transfers can motivate public schools to raise achievement. By contrast, in Pinellas the transfers themselves were academically disadvantaged and did not improve through transferring. Overall, open-enrollment competition effects appear context-dependent: if transfers are modest, little change might occur; if substantial transfers target particular schools, we see some public-school response.

Patterns and Contradictions

Synthesizing across all four choice types, a few broad patterns emerge:

- **Generally small spillover effects.** When significant, competition-induced gains in public schools tend to be small. Charter-school and voucher studies often report modest effect sizes (sometimes less than 0.05–0.10 standard deviations) and frequently null findings. Large "rising tides" lifting all boats are rare. The one exception is the Florida voucher context, where heightened competition was measurably beneficial. Even there, gains were described as "modest."

- **Mixed directions (positive vs. negative).** Evidence is not one-sided. Charter studies yield both slight positives (e.g. Sass 2006) and negatives (e.g. Han & Keefe 2020). Voucher competition in Florida has been positive, whereas initial reviews of vouchers elsewhere found null or ambiguous results. Magnets almost uniformly benefit their own admits but may leave other schools worse off;

open enrollment appears to improve sending districts while individual transferees fare worse. Thus, in each category there are contradictory findings depending on design, location, or time period.

- **Context matters.** The impact of choice appears to depend heavily on local context, program design, and market saturation. For instance, Florida's voucher programs (which are large, targeted, and rapidly expanded) show competitive effects, whereas smaller or incremental voucher expansions have shown little. Charter competition effects are often observed in specific cases (like Florida or districts with many charters) but not at a national scale. Magnet outcomes depend on the magnet's quality and admission criteria; open enrollment effects require enough student movement to create pressure. Internationally, education systems with strong accountability mechanisms (like test-based accountability) may amplify competitive signals. For example, Woessmann (2007) finds in cross-country regressions that higher private-school competition correlates with higher student performance overall. Yet in the Netherlands, where competition is long-established, one study found a *negative* relationship between competition and achievement. Sweden's universal voucher program shows positive outcomes for switching students but also raises equity concerns. These contrasts underscore that effects are not uniform globally.

- **Mechanisms are complex.** Several theoretical pathways could operate. As noted, competition might spur public schools to improve instruction or retention (a positive spillover), or it might simply re-sort students. Cream-skimming is a key worry: if choice policies allow motivated families to concentrate in certain schools, then public school averages may decline. Empirical findings of negative or null effects are often interpreted through cream-skimming and selection bias. For example, Ni and Arsen (2010) caution that competition can decrease achievement if higher-scoring students are lured away. This would explain why sometimes the academically neediest students remain in weaker schools with fewer gains.

Methodological Strengths and Limitations

The reviewed studies exhibit a range of methodological approaches. Many use longitudinal school or student-panel data with controls (as in Sass 2006 or Han & Keefe 2020), while others exploit natural experiments or lotteries. Key design features and limitations include:

- **Fixed-effects and difference-in-differences:** Several studies (Sass 2006; Bifulco & Ladd 2006; Welsch & Zimmer 2012) use school or district fixed effects to control for time-invariant factors, comparing trends before and after charter or open-enrollment entry. These designs can control for pre-existing differences but may miss time-varying confounders.

- **Instrumentation/IV:** To address selection, some studies use instruments. Ozek (2009) instruments student choice with proximity measures, and Welsch & Zimmer (2012) exploit border characteristics (number of neighboring schools) to instrument open-enrollment flows. These attempts strengthen causal claims, but validity depends on finding a truly exogenous instrument.

- **Lotteries:** While lottery data are ideal to compare admittance vs. non-admittance within demanders, they are rarely available for competition effects (the lottery applies to the magnet or charter applicants, not the competing district as a whole). However, some studies of magnets and charter admissions indirectly inform us that admitted students do modestly better, implying that stay-behind schools lose those gains.

- **Aggregate vs. student-level analysis:** Several charter/voucher studies use district- or school-level averages (e.g. Han & Keefe 2020; Figlio & Hart 2014). Aggregation can mask within-school heterogeneity and is subject to ecological bias. Others use student-level panel data (Sass 2006; Bifulco & Ladd 2006), which is stronger but requires detailed longitudinal data (often not available beyond test records).

- **Measurement of competition:** Studies vary in how they quantify competition. Common measures include charter enrollment share in a district (Han & Keefe 2020), market distance to nearest charter (Sass 2006), count of nearby private schools (Figlio & Hart 2014), or actual student transfer counts (Welsch & Zimmer 2012). Different measures can yield different results. For example, a study using a simple count of charters might miss intensity differences. Consistency of competition measures is a challenge in this literature.

- **Time horizon:** Many studies look at short-term test-score impacts (1–3 years after policy change). Competitive effects may require longer to materialize or may wane as all schools adjust. For instance, Sass (2006) found charter effects in math emerged by the fifth year of a charter's operation. Other studies with only 1–2 years of data may understate impacts.
- **Generalizability:** Most evidence comes from U.S. states or districts with particular choice rules. International findings (e.g. Woessmann 2007, Dijkgraaf 2008, Sweden 2019) caution that local governance, funding, and accountability conditions can reverse effects. Thus, transferability of findings across systems is uncertain.

Overall, the literature is methodologically challenging. There are relatively few randomized experiments (since randomization typically applies to student admissions, not to community-level competition). Much of the evidence is quasi-experimental or associational. As a result, selection bias and unobserved confounders cannot be entirely ruled out. Publication bias is also possible: positive "rising tide" findings may attract attention, whereas null results might go unpublished. We note that recent systematic reviews point out that studies use heterogeneous methods and often arrive at divergent results.

Discussion

Bringing together the above findings, we note several **recurrent themes**:

- **Competition can help, but is not magic.** School choice policies sometimes induce modest improvements in remaining public schools, consistent with theory of competitive pressure. The Florida voucher cases provide the clearest example: studies observed small but significant test-score gains for public students under increased private competition. In open-enrollment, Wisconsin districts under severe outflow pressure similarly improved test scores. These illustrate that when competition is strong and sustained, public schools may respond with meaningful changes (better instruction, focus on accountability, recruitment of effective teachers, etc.).

- **Selective benefits.** When benefits do occur, they often favor more advantaged or motivated students within public schools. For example, Figlio et al. (2022) found the biggest gains in voucher-competitive markets among low-income or at-risk public students, suggesting targeted improvement. Conversely, charter competition has sometimes been shown to help less advantaged public-school students in specific contexts. However, selection effects also appear: often it is struggling or minority students who leave under choice, which complicates the net impact.

- **Cream-skimming and stratification.** Negative or null spillovers are frequently attributed to cream-skimming by choice schools. If charter or magnet schools enroll disproportionately high-achieving or motivated students, the public schools they draw from might see their average performance fall. Charter studies noting negative effects can be understood this way: charters take top students (or at least "sharks leave the pool"), leaving behind higher concentrations of struggling students. Theoretical work (Ni & Arsen 2010) warns that unless parents sort purely on school quality, competition can backfire.

- **Heterogeneity by policy design.** The **type of choice policy matters**. For instance, means-tested vouchers (targeting disadvantaged students) may increase competition only among a subset of public

schools, whereas universal choice affects all. Charter schools often cluster in urban districts, affecting those contexts differently than voucher markets. Magnet programs are usually intra-district and may affect segregation differently than cross-district choice. Thus, one cannot generalize "all choice causes X." Each setting must be examined.

- **Contradictions reflect varying contexts.** The literature contains direct contradictions. For example, one long-term review (Ni & Arsen 2010) noted that about as many studies found small positive charter effects on public schools as found null or negative effects. Similarly, voucher effects range from positive (Florida) to null/negative (some other states). Even within a country, different districts show different outcomes. Internationally, the Dutch finding of a negative competition-achievement link contrasts sharply with the cross-country positive correlations. These contradictions likely reflect contextual factors: the strength of accountability, funding formulas, regulatory environments, and initial school quality all modulate how competition plays out.

Methodological Considerations. Many studies rely on assumptions that merit scrutiny. For example, district fixed-effects analyses assume that absent choice policies, test-score trends would have been parallel; this may not hold if charters are attracted to lower-performing districts. Instrumental-variable designs rest on the instrument's validity (e.g. proximity as exogenous to achievement), which can be challenged if families choose residences based on school quality. Moreover, most studies measure short-term test scores; they might miss longer-run outcomes (graduation, college entry). Some recent work has begun to examine longer effects (e.g. Foreman, 2017 on high school graduates), but conclusive data are scarce.

In sum, we find no clear consensus that school choice uniformly improves achievement via competition. Competitive effects tend to be **small and inconsistent**. Many studies conclude *"no substantial spillover"* in academic achievement, while others find modest positive impacts under the right conditions. On balance, the weight of evidence suggests that the promise of substantial academic "spillover" benefits from choice is not realized in most contexts. That is not to say choice has no place – but rather that policymakers should not assume large automatic gains for all students.

Conclusion

This systematic review synthesized extensive evidence on the competitive impact of charter schools, voucher programs, magnet schools, and open-enrollment policies on student achievement. We found both positive and negative effects reported in the literature, with a prevailing tendency toward modest or null outcomes. **Charter school competition** has generally not yielded clear gains for traditional public students – often effects are null or even slightly negative. **Voucher competition** shows some positive impact in well-studied cases like Florida, though results vary by state and program design. **Magnet schools** improve outcomes for attendees but likely worsen outcomes in the schools they leave behind, and system-level effects remain under-researched. **Open enrollment** creates mixed results: sending districts under pressure tend to improve, but individual transfer students often see no gain.

Methodological differences and context-specific factors account for much of the heterogeneity. Many studies rely on observational designs that can never fully disentangle competition effects from underlying student differences. Nevertheless, a cautious interpretation is that choice-driven competition can induce some public school improvement in favorable conditions (especially under high-stakes accountability and when family choice is widespread), but it is neither guaranteed nor large in magnitude. Policymakers should note that competitive effects appear conditional: they require substantial choice engagement and effective incentive structures. The literature also suggests competitive pressure may advantage already higher-performing schools unless explicitly counterbalanced.

Future research should continue to employ rigorous quasi-experimental methods, compare multiple locales, and assess longer-term outcomes (graduation, college) as more data become available. It

should also examine equity implications: do competitive benefits accrue equally, or do they widen gaps?

In conclusion, expanding school choice can reshape educational landscapes, but its effect on student achievement is complex. Our synthesis indicates that school competition alone is not a panacea for academic improvement. While choice can motivate some schools to raise performance under certain conditions, the overall "lift" to student learning is typically small and context-dependent.

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