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Interdistrict and Charter School Mobility in Arizona: Understanding the Dynamics of Public School Choice

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Interdistrict and Charter School Mobility in Arizona: Understanding the Dynamics of Public School Choice

Cover Page Footnote

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Interdistrict Mobility and Charter Schools in Arizona: Understanding the Dynamics of Public School Choice

Introduction

Many policymakers view market-oriented school choice policies such as charter schools and open enrollment as ways to stimulate competition among schools and provide families with improved schooling options. In this paper, we examine the patterns of interdistrict student movement within the public school sector in Arizona, or student movement between traditional public school districts (hereafter referred to as “school districts”) and between school districts and charter schools. Arizona has supported public school choice through interdistrict enrollment policies and charter school reform since the early 1990s. Our analysis addresses lesser-known and understood outcomes of public school choice policies that have particular relevance for other state and local settings where multiple public school choice programs are operating simultaneously.

This analysis extends an exploratory study that focused on student movement patterns within metropolitan Phoenix, the largest public school “market” in Arizona to assess if the patterns we documented are evident statewide and within other areas of the state (Authors, 2012). Our research questions are:

- a) What are the patterns of student mobility between and within public school sectors in Arizona?
- b) What are the relationships between district and charter school mobility rates and other district or school characteristics?
- c) Are there variations in the patterns of student movement within and across local markets?

We expected to find differences in the patterns of movement between districts and charter schools and that these differences are associated with district or school characteristics. We also expected to find differences within and across educational settings that reflect regional differences in the configuration of districts and charter schools. Our findings indicate that most students in Arizona move between districts rather than from districts to charter schools. We also document a two-way pattern of movement between charters and school districts.

A substantial body of research explores the causes and consequences of student movement between public school districts and charter schools (e.g., Garcia, 2008; Renzulli & Evans, 2005; Weiher & Tedlin, 2002). Likewise, numerous studies have assessed the characteristics of students who participate in interdistrict choice programs (e.g., Fossey, 1994; Holme & Richards, 2009; Witte & Thorn, 1996) and the influences on school districts’ participation in, and responses to, interdistrict choice (e.g., Fowler, 1996; Ghosh, 2010). The present study is unique because we document patterns of student movement within the public school sector in local education markets by analyzing interdistrict and charter school movement simultaneously in a state with long-standing school choice policies. These patterns of student movement are potentially relevant for policymakers in other state and local contexts because can they help us

assess the extent to which public school choice policies have fostered the education markets that policymakers envisioned. Given the continual growth in the charter school sector (Snyder, de Brey, & Dillow, 2016), our findings may also provide insights about patterns of student movement in other settings where multiple public school choice policies are operating simultaneously. These findings also have implications for the school leaders in these settings who have to grapple with the possible fiscal consequences of declining enrollments and the challenges of educating students who move frequently between districts and sectors (Moody's Investor Service, 2013). If the Trump administration's efforts to provide school vouchers for tuition at private schools are successful (Klein & Ujifusa, 2017), our findings may also help predict the possible effects of introducing voucher programs alongside existing public school choice programs on student enrollments.

School Choice in Arizona

Charter schools operate in 42 states and the District of Columbia (DC), and enrolled 2.5 million students in 2013-14 (U.S. Department of Education, 2016). They serve a small but growing share of public school students. Between 1999-2000 and 2013-2014, charter school enrollment increased from 0.7 percent of public school students to 5.1 percent (U.S. Department of Education, 2014, 2016). Forty-six states and DC have some type of open enrollment policies outlined in their state education codes (Wixom, 2017). Mandatory interdistrict open enrollment policies require districts to take part in them, whereas voluntary policies allow districts to choose if they will participate (Wixom, 2017). While many states with mandatory open enrollment policies target specific geographic locations, schools, or groups of students (e.g., students attending low performing schools or low income students), Arizona is one of 11 states that does not limit families' participation in interdistrict open enrollment.¹ As a result, all Arizona school districts must allow students to enroll in their schools, space permitting, regardless of their districts of residence.

Although most public school students do not utilize school choice programs or policies (Garcia, 2010; Grady & Bielick, 2010; Snyder et al., 2016), expanding school choice has been a long-standing goal of Arizona policymakers. Arizona's provisions for open enrollment and charter schools were approved by the state legislature in 1994 in a single bill, HB 2002 during a special legislative session (Author, 2009).² The open enrollment and charter school provisions in HB 2002 put Arizona at the forefront of the movement to expand public school choice. Arizona was the seventh state to pass legislation mandating open enrollment policies for all public school districts (State of

¹ The other 10 states are: Colorado, Delaware, Florida, Idaho, Iowa, Minnesota, Nebraska, South Dakota, Texas, and Utah. Alaska and Arkansas require interdistrict open enrollment for students attending schools in facilities distress, while Vermont limits interdistrict open enrollment to high school students (Wixom, 2017).

² HB 2002 was a compromise from earlier bills considered by the Arizona legislature during the two regular legislative sessions that preceded it (Luther, 1995). The final version of HB 2002 did not include a school voucher program in earlier versions of the bill.

Missouri, 2009).³ Before HB 2002 took effect, Arizona school districts established their own policies regarding the enrollment of non-resident students, and a considerable number of students took advantage of these policies.

According to an early analysis conducted by the Arizona Department of Education (Gallagher, 1992), more than 40,000 students opted to enroll in schools outside their assigned school districts in 1992 (Gallagher, 1992). Between the 2004-05 and 2007-08 academic years, more than one-quarter of K-12 students in Arizona transferred schools, with just under 15% of students making an interdistrict transfer and approximately 6% of students transferring to a school within their districts of residence (Fong, Bae, & Huang, 2010). Likewise, Arizona was the fourth state to pass charter school legislation. In 2013-14, charter schools comprised 27% of all Arizona K-12 schools and enrolled 18% of the school-age population (U.S. Department of Education, 2015). While these figures suggest that Arizona's public school choice policies have created a unique education market, similarly high mobility rates have been documented elsewhere (e.g., Dauter & Fuller, 2016; Hanushek, Kain, & Rivkin, 2004).

Conceptual Framework

Market-oriented school choice policies such as interdistrict choice and charter schools are a means of ensuring that students are not required to attend an assigned public school based on where they live. The key assumption underlying market-oriented choice is that given the opportunity, many families will strategically seek out and move to better schools for their children, a process we refer to as active choice (Authors, 2012). Ideally, schools will compete for such students by finding market niches through some form of differentiation (Chubb & Moe, 1990). School choice advocates contend that competition will force districts and schools to function as education markets and thereby make them more efficient, effective, and responsive to the needs of parents and students (Friedman, 1962). As a result, schools will improve over time as they vie for students or close if they lose market share (e.g., Forster, 2013; Hoxby, 2003).

In essence, market-oriented school choice policies are aimed at facilitating a form of Tiebout choice, where consumers (parents and students) choose residential locations that provide the services that best meet their needs and preferences (Tiebout, 1956; Urquiola, 2005). These can include districts or schools that offer specific curricular foci (e.g., the performing arts, science and mathematics), child-rearing philosophies, instructional approaches, or extracurricular activities. Some researchers have argued that active choice facilitated by school choice policies can ultimately benefit students (Hanushek et al., 2004). They claim that when families choose among schools to find better matches, in the aggregate and over time these school moves will raise school quality as measured by student achievement. Yet other studies suggest that most school changes depress student achievement (Grigg, 2012; Ni & Rorrer, 2012). In addition, critics of market-oriented school reforms argue that charter schools and other

³ Minnesota, Iowa, Arkansas, Nebraska, Washington, and Utah passed open enrollment laws before Arizona (State of Missouri, 2009).

forms of school choice such as voucher programs may increase racial and socioeconomic segregation (e.g., Cobb & Glass, 1999; Frankenberg, Siegel-Hawley, & Wang, 2011; Frankenberg, Kotok, Schafft, & Mann, 2017; Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; Lubienski, Gulosino, & Weitzel, 2009; Renzulli & Evans, 2005).

Perhaps most importantly, even in states or districts with long-standing school choice policies, most students attend their assigned public schools (Dauter & Fuller, 2015; Grady & Bielick, 2010), or remain enrolled in the same schools from one year to the next (Garcia, 2010). Moreover, most forms of student movement cannot be reliably attributed to active choice. That is, even in states with mandatory interdistrict choice policies, it is likely that some student mobility between school districts is a result of active choice while other forms of mobility are reactive (Rumberger, 2003). Changes in families' residence or employment often prompt school moves. Some researchers distinguish between active choice and reactive mobility and argue that the latter is more disruptive to students' learning and lowers school achievement (Hanushek et al., 2004; Xu & Hannaway, 2009).

Literature Review

We analyzed the nonpromotional⁴ movement of elementary grade students enrolled in a district or charter school at the end of the 2007-08 school year who transferred to another district or charter school within the local education market at the beginning of 2008-09 for reasons other than "aging out" of elementary grades. Our measures of student movement are district and charter school-level exit and entry rates. We used the Office of Management and Budget's Core Based Statistical Areas (CBSAs) as our proxy for local education markets because they delineate geographic areas that are socially and economically integrated (United States Census Bureau, 2012).⁵ While we cannot directly assess families' motivations for changing schools, we focus on a specific type of student movement, school changes between school years, because unlike mobility during the school year, these are more likely to be a result of active choice than mid-year school changes. Our assumption is that student movement between sectors (districts to charter schools and vice versa) is more likely to be a form of active choice, as is some of the movement between districts within CBSAs. Because some of the patterns we observe are likely shaped in part by reactive mobility (i.e., some of the student movement between districts), below we provide an overview of research on charter schools and interdistrict choice, as well as findings from analyses of student mobility.

Charter Schools

⁴ Non-promotional movement is student mobility between districts or charter schools that is not due to regular grade level progression.

⁵ CBSAs are statistical areas that contain minimum populations of 10,000 and include core urban areas and adjacent counties.

Nationally, charter schools tend to serve fewer White students and a higher percentage of African American students than traditional public schools (U.S. Department of Education, 2016), although there is considerable variation in charter school demographics within and across states and regions (Frankenberg et al., 2011). These demographic differences are attributable in part to locale; charter schools tend to be concentrated in urban areas, particularly in large cities that have greater percentages of minority students. Some studies indicate that charter schools increase racial and ethnic segregation in public schools by increasing the number of racially-isolated schools (Bifulco & Ladd, 2007; Cobb & Glass, 1999; Frankenberg et al., 2011; Gulosino & d'Entremont, 2011; Whitehurst, 2017). However, Ritter, Jensen, Kisida, and McGee (2010) critique the claim that school segregation is attributable to charter schools because the traditional public schools students would otherwise attend are also segregated (see Frankenberg, Siegel-Hawley, and Orfield's [2010] response).

Whitehurst (2017) assessed the relationship between a district-level index of public school choice with a measure of the racial imbalance between high school enrollments and the school-age population of the schools' catchment area for 106 of the largest districts in the U.S. He found a positive correlation between school choice options and racial imbalance for blacks and whites; districts with a broader array of policies that enable school choice tend to be more racially imbalanced than districts with more limited choice policies. Choice policies were not associated with racial imbalances of Hispanic and Asian students. Studies using student-level data to conduct finer-grained analyses of student movement patterns confirm these broader trends. Most students who move from traditional public schools to charter schools move to charter schools with higher percentages of racially similar students although there is considerable variation across groups and locales (Bifulco & Ladd, 2007; Frankenberg et al., 2017; Garcia, 2008; Whitehurst, 2017).

Finch, Lapsley, and Baker-Boudissa (2009) examined the influences that shape non-promotional movement out of charter schools in Indiana. While they did not compare charter schools with traditional public schools, they documented high exit rates from of a sample of 11 charter schools that were more than a year old in 2003-04. Non-White students and lower achieving students were more likely to leave charter schools before they reached the highest grade offered by the schools than their White and higher achieving peers. In contrast, Ni and Rorrer (2012) documented lower turnover in charter schools compared to traditional public schools in Utah. However, Utah's charter schools tend to serve a predominantly White and more affluent student population than charter schools in other states, so the lower mobility rate they observed may be related in part to student demographics.

Overall, these studies did not address the effects of these demographic patterns and enrollment trends on school districts, although they do provide important insights into broader state or regional enrollment trends, the factors associated with students' movement to charter schools, and achievement outcomes. They also tend to focus on a single form of public school choice. In our earlier study of student movement between school districts in metropolitan Phoenix (Authors, 2012) we found that urban districts in the metropolitan core tended to have higher rates of mobility and a greater number of

students moving between districts while suburban districts had lower rates of mobility but comparatively higher rates of students moving to and from charter schools. In general, mobility patterns tended to be reciprocal rather than one-way, which may be more aptly characterized as a two-way pattern rather than one that suggests high levels of competition between districts and charter schools.

Interdistrict Choice

Most analyses of interdistrict choice focus on the relationship between the characteristics of school districts and outcomes ranging from participation in a voluntary choice program, patterns of student movement, and student demand. District wealth has been identified as a key factor shaping the likelihood that districts will participate in voluntary choice programs (Fowler, 1996; Rincke, 2006) and how they respond to the loss of students to other districts (Armor & Peiser, 1998, Aud, 1999). School districts may also be more likely to participate in a voluntary interdistrict choice program if neighboring districts are participating (Fowler, 1996; Rincke, 2006).

One consistent finding across states is that receiving districts tend to have greater financial resources (e.g., higher per pupil spending, higher family incomes, or property values) than sending districts (Armor & Peiser, 1998; Fossey, 1994; Holme & Richard, 2009; Welsch, Statz, & Skidmore, 2010). Some studies suggest that families are more likely to leave districts with greater percentages of minority and poor students than their destination districts (Armor & Peiser, 1998; Welsch et al., 2010). However, Holme and Richard (2009) found evidence of different patterns of mobility among White and minority students in metropolitan Denver. While White students were leaving relatively less White and affluent districts for Whiter and lower poverty districts, minority students were leaving Whiter and more affluent districts to attend districts with higher percentages of poor and minority students. The net effect of these patterns was to increase the racial and class segregation of school districts.

These patterns may be partially attributable to differences in student achievement. Reback (2008) found that district achievement was a stronger predictor of transfer requests in Minnesota than measures of socio-economic status and spending. Moreover, districts' transfer requests tended to increase as test scores in neighboring districts decreased. In a study of the influences on transactional open enrollment flows in Colorado and Minnesota, Carlson, Lavery, and Witte (2011) found that higher achieving districts and lower poverty districts experienced greater student loss than lower achieving districts; transferring students moved to districts with comparatively higher achievement and spending than the districts they moved from. The racial composition of districts was not associated with patterns of student movement once other variables were accounted for. The authors suggested that most families participating in interdistrict choice were primarily concerned with indicators of school quality such as test scores, but other factors (e.g., the demographic composition of school settings) also played an important role in families' choices. However, transportation or the lack thereof may also have shaped these findings. In settings where families have to provide their own transportation to take advantage of school choice programs and policies, poor

families are less likely to participate than more affluent families because poor families have less access to transportation.

Mobility

Research on non-promotional student mobility indicates that there is substantial student movement between schools (e.g., Fong et al., 2010, U.S. Government Accountability Office [GAO], 2010). According to Garcia et al. (2010), 15% of Arizona elementary school students changed schools between the 2007-08 and 2008-09 academic years. Charter school students were more likely to change schools (23%) than students enrolled at traditional public schools (13%) (Garcia et al., 2010).

In general, student mobility rates vary by geographic locale and student demographics (Authors, 2012). Students in urban areas are more mobile than students in suburban or rural areas (U.S. GAO, 1994; Rumberger, 2003). Lower income, minority, special education, and English language learner students tend to have higher rates of mobility than their more advantaged peers (Alexander, Entwisle, & Dauber, 1996; Fong et al., 2010; Grigg, 2012; Kerbow, 1996; Kerbow, Azcoitia, & Buell, 2003; Lleras & McKillips, 2017; Parke & Kanyongo, 2012; Rumberger, 2003; Schafft, 2006; U.S. GAO, 2010; Wright, 1999).

Some studies have examined the relationship between mobility and school and student achievement. In an early study, Bruno and Isken (1996) found that in the Los Angeles Unified School District the year-to-year mobility rate was negatively related to school achievement. More recently, Parke and Kanyongo (2012) analyzed mobility patterns in a large northeastern urban school district and found that there was a considerable achievement gap between mobile students and their more stable peers, and these gaps were similar across racial/ethnic groups. Scherrer's (2012) analysis of data from the Early Childhood Longitudinal Study (ECLS-K) indicated that students who changed schools between the third and fifth grades had lower reading achievement after controlling for race, student socioeconomic status, and school socioeconomic status (see also Lleras & McKillip, 2017). Scherrer (2012) also analyzed the relationship between mobility, school socioeconomic status, and school achievement within a single school district to suggest that student mobility mediates the relationship between school socioeconomic status and school achievement.

As suggested above, some studies of school choice distinguish between different types of mobility and suggest active choice via switching schools to attend a charter school has a positive effect on student achievement (Hanushek et al., 2004) although other studies have produced conflicting findings. For example, Bifulco and Ladd (2007) found that students who left traditional public schools in North Carolina to attend charter schools had lower achievement in both math and reading than their peers who did not change schools and that these effects were particularly pronounced for African American students whose parents did not attend college. Likewise, compared to their peers who did not change schools, students who transferred from traditional public schools to charter schools or another traditional public school in Utah tended to have lower achievement, while students who transferred from a charter school to a traditional

public school had higher achievement (Ni & Rorrer, 2012). Grigg (2012) found that students in Nashville who changed schools between school years for reasons other than promotion had lower math and reading achievement than their stable peers which suggests that school moves due to active choice may lower student performance, at least in the short term.

Finally, a limited number of mobility studies address the reasons for student movement. For example, Kerbow et al. (2003) found that students in Chicago moved schools due to residential changes (58%) or concerns about safety or academic opportunity (42%). Their findings also suggested that active choice accounted for a substantial portion of student movement. In contrast, Schafft's (2006) case study of student mobility in a poor rural New York school district indicated that 29% of students entered or exited the district during the 2003-04 academic year, and these moves tended to be an outcome of family poverty and economic instability rather than active choice.

This study extends the literatures described above by examining patterns of movement between school districts and between school districts and charter schools simultaneously, which allows us to make comparisons across sectors and regions. This approach has allowed us to highlight an interesting and seldom studied pattern of student movement. Students moved from charter schools and into traditional school districts at roughly the same rates as students who left traditional school districts for charter schools. In addition, we also document much higher rates of student movement between school districts (at least some of which is attributable to active choice) compared to the rates of students that leave traditional public schools to attend charter schools.

Data and Methods

We analyzed statewide district-level transactional data (Carlson et al., 2011) obtained from the Arizona Department of Education's Data Warehouse that tracked student enrollment for funding purposes. We also mapped mobility patterns in the three largest CBSAs in the state using ArcGIS to compare and contrast the differences within and across local markets; our maps allowed us to assess the geospatial relationships between the two forms of public school choice. Our data is comprised of district and charter school-level counts of elementary grade students who were eligible for enrollment in one of the districts' schools at two time points (i.e., they did not "age out" of the grades offered by the district). Because in many Arizona communities schools are organized into separate elementary and high school districts that essentially function as separate markets with different numbers of school districts within the public sector (Urquiola, 2005), we focused on districts and charter schools that served elementary grade students. There are only 27 high school districts in the state that span multiple elementary school districts and cross municipal boundaries. The large number of small elementary districts provides greater options for interdistrict mobility for elementary grade students than for high school students. For example, in central city Phoenix, 11 elementary districts feed into one high school district. In addition, many charter high schools target at-risk students, a market segment, so they are not competing for the general school population in the same way that most elementary-serving charter schools

and districts are. Finally, focusing on elementary districts also facilitated mapping because the two types of districts cover the same geographic areas in some regions. The charter schools were largely clustered in city and suburban districts in the two major metropolitan areas in the state, Phoenix and Tucson, although a number of charter schools were located in rural school districts.

Mobility Variables

For each school district and charter school we had counts of: a) the students who remained enrolled in the same district or charter school between the end of the 2007-08 school year and the beginning of 2008-09 (stayers); b) the students who moved to any other district or charter school within the state (movers), listed by district or charter school; and, c) the racial demographics of stayers and movers. That is, our analysis focuses on elementary grade students who, once enrolled in a district or charter school, moved to another school at the beginning of the following school year. We refer to these students as eligible for re-enrollment in the sections that follow. Our student counts did not include students who moved out of the school district or charter school because of grade-level progression (e.g., non-promotional moves), students who moved out of state, or new students in 2008-09. We matched this dataset to district-level variables in the National Center for Education Statistics *Common Core of Data* (CCD) and aggregated the data to calculate the variables used in our analysis:⁶

- a) the percentage of students who were enrolled in the school district or charter school at the end of the 2007-08 school year who remained enrolled at the beginning of the 2008-09 school year (stayers);
- b) the percentage of students who moved to another school district or charter school within the state at the beginning of 2008-09 (movers);
- c) the percentage of movers who attended a school district with the same CBSA;
- d) the percentage of movers who attended a charter school within the same CBSA;
- e) the percentage of students entering the school district or charter school at the beginning of 2008-09 from any school district or charter school in the state (incomers);
- f) the percentage of incomers who attended another school district within the same CBSA in 2007-2008, the previous academic year; and
- g) the percentage of incomers who attended another charter school within the same CBSA in 2007-08.

⁶ Categories c and d are subcategories of category b. Likewise, categories f and g are subcategories of category e. We used the CCD to identify district type (school district or charter school) and to match districts and charter schools to the CBSA. The denominators for categories a through d were the total of stayers plus movers, or all of the students in enrolled in elementary grades in each district at the end of 2007-08 that were eligible to re-enroll at the beginning of the following academic year (2008-09). The denominators for categories e through g were the total of stayers plus incomers. These counts are provided in Table 1 as Students End 2007-08 and Students Beg. 2008-09, respectively.

We also calculated the percentage difference in reenrollment as the difference between the number of the district or charter school's eligible re-enrollment students at the beginning of 2008-09 minus the re-enrollment sample at the end of 2007-08, divided by the re-enrollment sample in 2007-08.

Districts and charter schools without complete information on the sending or receiving districts/schools, or those that were missing information on the CBSA from the CCD were omitted from the dataset. This strategy excluded a handful of charter schools that closed. Our goal in this analysis was to assess movement between districts and charter schools that were open for business over the two-year period of the study, rather than forced moves due to school closures. While some of the school districts in our sample are small, we did not exclude them from the analysis because there is a wide range in school district size in Arizona. In 2008-09, 20% of all school districts in Arizona served 100 or fewer students while 12% served 10,000 or more students.⁶

Our final dataset contains almost the full population of elementary grade districts and approximately half of the charter schools in the state.⁷ While our data allow us to assess movements between public school districts and charter schools, it underestimates the student movement within the traditional public school sector because we cannot track intradistrict movement. Our data also do not allow us to address within-year mobility, which is a different although related phenomenon. Our goal in this analysis is to provide insights into why students and families, once enrolled in a particular district or charter school, leave that setting and enroll elsewhere. Likewise, while our data allow us to examine interdistrict and charter school mobility at one point in time, the patterns we document here may change as the number of charter schools expands and charter school enrollment increases.

Demographic and Achievement Variables

Our dataset also included counts of movers and stayers by race/ethnicity, which we used to calculate variables for the percentages of students attending the districts and charter schools in our sample that were eligible to re-enroll by race/ethnicity and the race/ethnicity of movers. These variables allow us to assess the possible impact of student mobility on district and charter school demographics. That is, do the patterns have the potential to increase racial segregation in districts and charter schools?

Once the dataset was constructed, we merged it with additional variables drawn from the CCD and state achievement data. Two additional demographic variables are drawn from the CCD: a) the percentage of students in the district or charter school who have an individual education plan (IEP); and b) the percentage of students eligible for free and reduced lunch. For district and charter school achievement, we used the

⁶ See also Carlson et al. (2011), which retained small districts in multivariate analyses.

⁷ Nineteen small elementary districts located outside of CBSAs were not included in the analysis. The majority (63%) of these served fewer than 100 students. Likewise, there were eight unified school districts, all located outside of CBSAs, that served fewer than 13,000 students in total in 2010-11 that were not included in the analysis.

district-level Normal Curve Equivalent (NCE) on the state-administered Terra Nova tests in Reading, Language Arts, and Mathematics, which we averaged across all elementary grades tested. Because the 2007-08 scores were released after the 2008-09 school year began, we used the 2006-07 test results because it was the achievement data that was publicly available when families were making their schooling decisions for 2008-2009.

Our analysis proceeds as follows. After providing descriptive statistics for both sectors, we analyze the patterns of movement to and from school districts and to and from charter schools separately. We begin by analyzing each type of within-CBSA movement, using regression models. Next we analyze how mobility flows work together by identifying high and low mobility districts. Our final analysis examines mobility within the three largest CBSAs in the state: Phoenix-Mesa-Scottsdale, Tucson, and Yuma.

Results

Our full sample contained 177 school districts and 233 charter schools.⁸ While the descriptive statistics provided in Table 1 highlight important differences between the two sectors, the sizable standard deviations on most variables indicate that there was considerable variation within each group. For example, while charter schools served far fewer elementary grade students than the school districts, there was also a wide range in district size (from four elementary grade students who were eligible to re-enroll to more than 32,000). The median district served approximately 600 elementary grade students.

⁸ Charters operated by the same educational management organization (EMO) essentially function as a district in the analysis and are treated as districts in CCD and the state achievement data. Our sample contained 233 of the 281 elementary-serving charter schools that were open during both years of the study. The loss in cases is due in part because the charter schools were treated as districts when the data was aggregated.

Table 1
Descriptive Statistics by Sector

	School Districts (N=177) Mean (S.D.)	Charter Schools (N=233) Mean (S.D.)
Students End 2007-08 (#)	2598 (4809)	187 (240)
Total Movers (#)	207 (324)	35 (56)
Students Beg. 2008-09 (#)	2590 (4781)	190 (239)
Total Incoming (#)	196 (324)	39 (66)
Percentage difference	-.85 (6.41)	13.13 (107.47)
<i>Mobility Variables</i>		
Movers (%)	9.25 (6.12)	21.69 (11.91)***
Movers to Local School Districts	53.54 (29.08)	66.06 (22.54)***
Movers to Local Charter Schools	12.53 (14.38)	21.41 (17.59)**
Incoming (%)	8.40 (4.32)	22.75 (16.39)***
Incoming from Local School Districts	55.58 (30.45)	67.22 (24.48)***
Incoming from Local Charter Schools	9.66 (10.62)	20.03 (19.21)***
<i>Demographic and Achievement Variables</i>		
End of 2007-08 (%)		
White	46.14 (29.32)	55.37 (28.65)
Hispanic	39.72 (28.45)	28.65 (25.72)**
African American	2.90 (3.72)	6.81 (7.92)***
American Indian	9.81 (23.53)	6.07 (17.39)**
Asian American	1.43 (1.79)	3.10 (3.82)***
Movers (%)		
White	47.84 (30.36)	53.52 (29.34)
Hispanic	33.47 (27.32)	28.39 (26.30)
African American	3.96 (5.80)	7.67 (11.48)***
American Indian	11.61 (24.50)	6.25 (17.33)***
Asian American	1.43 (2.82)	3.30 (6.89)***
IEP (%)	12.83 (5.49)	9.31 (7.96)
IEP missing (%)	.02 (.15)	.06 (.24)***
FRL students (%)	55.26 (24.95)	47.10 (28.30)**
FRL students missing	.12 (.33)	.30 (.46)***
Mean NCE Reading	49.32 (7.13)	51.79 (10.52)***
Mean NCE Language Arts	48.97 (6.72)	51.87 (10.73)***
Mean NCE Mathematics	49.72 (7.35)	51.34 (11.21)***
Achievement Missing	.08	.13
Locale		
City	26 (15)	132 (57)
Suburb	12 (7)	41 (18)
Town	33 (19)	20 (9)
Rural	106 (60)	40 (17)

* $p < .05$. ** $p < .01$. *** $p < .001$

We began by examining general mobility patterns by sector before distinguishing between movement to and from charter schools, which is clearly active choice, and other types of mobility. We used t-tests to assess the statistical significance of the between-sector differences in means we observed. Our initial analysis indicated that on average, 9% of the students attending local school districts and 22% of students attending charter schools enrolled in a new district or charter school between the end of the 2007-08 and the beginning of the 2008-09 academic year. The percentage of students entering each sector roughly mirrored these figures (Table 1). In general, school districts and charter schools with high rates of movers (out-migration) also had relatively high percentages of incoming students (in-migration). The correlation between the percentage of students moving out of districts or charter schools and the percentage of incoming students was .58 ($n = 410$, $p < .001$).⁹ The sample of charter schools had, on average, much higher rates of both in- and out-migration than the school districts.

When we disaggregated the overall mobility rates to examine how much student movement occurred within the CBSA and by destination, it was clear that interdistrict mobility in Arizona is substantial. Even though charter schools have higher rates of mobility overall, because they are a much smaller sector of local public school “markets,” there are many more students moving between school districts than between charter schools. These figures also indicate that interdistrict mobility in Arizona was higher than in Colorado and Minnesota over the same period (Carlson et al., 2011). In addition, the percentage of students who entered charter schools from local school districts was similar to the percentage of students who exited charter schools for local school districts, which suggested a two-way pattern of student movement (Authors, 2012). On average, about two-thirds of the students leaving school districts moved within the CBSA (54% to another district and 13% to a charter school), compared to 87% of charter school students. A majority (66%) of students leaving charter schools moved to school districts within the CBSA while 21% moved to local charter schools. The state averages for incoming students roughly mirrored those of movers in each sector. These figures suggest that a substantial portion of charter school mobility is due to active choice, and one important type of active choice is enrollment in a school district after attending a charter school.

The 177 school districts in our sample served a lower percentage of White, African American, and Asian students and a higher percentage of Hispanic and American Indian students than the charter schools. Many of the differences in demographic composition were statistically significant. The racial demographics of the students who left our school districts were similar to the demographics of the school districts, as were the demographics of incoming students (not shown). As a result, the racial demographics of the elementary grade students enrolled in either sector changed very little from the end of 2007-08 to the beginning of 2008-09. School districts also served higher percentages of students with Individual Education Plans (IEPs) and

⁹ Our main variables of interest account for district or charter school size because they are the number of movers or incoming students by sector, divided by the total number of elementary students eligible to re-enroll. There were no substantial differences in the correlations when the sample was divided by sector.

students eligible for free and reduced lunch and the cross-sector differences were statistically significant. However, a substantial number of districts (12%) and charter schools (30%) were missing information on the latter.

Student achievement in the charter schools was marginally higher than achievement in the school districts across all subjects, and t-tests indicated that the differences in achievement were statistically significant. Most of the charter schools (75%) were located in cities and suburbs, while more than half of the school districts were in rural areas. In the analysis that follows, we begin with a more detailed analysis of mobility to and from school districts, followed by our analysis of charter schools.

School Districts

We used a subset of the variables shown in Table 1 to predict the characteristics associated with each type of mobility using ordinary least squares regression (OLS). The variables in the models predicting the percentage of movers (columns 1 and 2) were the characteristics of the districts students were moving from, while the variables in the models for percentage of incoming students were the characteristics of the districts students were moving to. Because we were missing information on the variables for the percentage of students with an IEP and achievement, our final model is based on a reduced sample of 161 school districts. However, t-tests indicated that there were no differences between the full sample and the regression sample (the descriptive statistics for the regression sample are provided in Appendix 1).¹⁰ Percentage White students is the omitted variable. Because districts varied considerably in the percentage of movers or incoming students and size (see Table 1), we also included these variables in the model. For the latter we used the number of eligible students who could re-enroll in an elementary grade (Students End 2007-08) as a proxy for district size. We also included the indicator variables for locale; city is the omitted comparison category.

Larger districts had more incoming students from charter schools, which is likely because larger districts are more likely to have a greater number of charter schools within or near their boundaries. Student demographic variables were associated with some, but not all forms of student movement to and from school districts. For example, school districts with higher percentages of Hispanic students were more likely to have higher rates of movement to and from local school districts, which may reflect the high rates of mobility among these groups. Districts with higher percentages of Hispanic students also had lower rates of mobility to charter schools. The results for the percentages of African American, American Indian and Asian American students were less consistent across the models, which is likely because these are relatively small demographic groups compared to Hispanic and White students. All else held equal, the percentage of students with IEPs was negatively associated with movement to charter schools. This may be because families receiving special education services in a school district are less likely to be attracted to charter schools, which tend to have less capacity to provide such services. Charter schools could also discourage families whose children

¹⁰ We did not include percentage of free and reduced lunch students in the final model because it would have resulted in a substantial loss of cases for both districts and charter schools.

have disabilities from enrolling (Zetino, 2017). IEP services may also be a pull factor that encourages families to remain enrolled in a school district.

Districts with lower student achievement had higher rates of movement to charter schools, which is not surprising. Yet districts with higher achievement had higher rates of student movement to other school districts. This finding is inconsistent with the theory underlying school choice reforms; we would expect that students would be more likely to remain enrolled in higher performing districts. Our models could also reflect two different dimensions of student mobility: a) reactive mobility between small districts serving high percentages of poor and minority students, and b) active choice of students within higher achieving districts who seek to move to districts with higher achievement than the districts they initially enrolled in (Carlson et al., 2011). However, the achievement of the receiving district was not a significant predictor of student movement into school districts from other districts or from charter schools. Interdistrict choice – which may or may not be a form of active choice – was the dominant form of school choice overall and the main form of student movement in districts with high percentages of underrepresented minority students. In addition, there were no clear patterns between student movement and student achievement. Finally, districts located in towns had less movement to and from school districts, which could reflect their relative isolation compared to urban districts.

Table 2
Regression Analyses Predicting Mobility from and to School Districts.

	Movers to Local School Districts (%) (1)	Movers to Local Charter Schools (%) (2)	Incoming from Local School Districts (%) (3)	Incoming from Local Charter Schools (%) (4)
Constant	-28.89 (28.09)	84.98*** (14.63)	37.21 (28.35)	13.85 (11.68)
Movers (%)	1.83*** (.45)	-.13 (.24)		
Incoming (%)			.29 (.52)	.32 (.21)
Students End 2007-08	.0004 (.001)	.0004 (.00)	-.0000 (.001)	.001** (.00)
Hispanic	.48*** (.10)	-.29*** (.05)	.34** (.10)	-.07 (.04)
African American	.85 (.72)	.05 (.38)	2.09** (.70)	-.26 (.29)
American Indian	.21 (.12)	-.29 *** (.06)	.02 (.12)	-.003 (.05)
Asian American	.95 (1.61)	1.00 (.84)	1.45 (1.57)	1.37* (.65)
IEP	-.17 (.48)	-.50* (.25)	-.70 (.48)	-.04 (.20)
Mean NCE Mathematics	.83* (.42)	-1.03*** (.22)	.16 (.42)	-.08 (.17)
Suburb	6.25 (8.40)	-1.35 (4.38)	5.16 (8.47)	-3.04 (3.49)
Town	-16.46* (7.25)	2.83 (3.77)	-18.10* (7.30)	-.13 (3.01)
Rural	-3.18 (6.66)	-3.22 (4.47)	-3.43 (6.72)	-2.79 (2.77)
R ² (N=161)	.40	.28	.41	.22

+*p*< .10. **p*< .05. ***p*<.01 ****p*< .001

While the regression analyses provide insights into the factors that, on average, have the strongest relationships with the different types of mobility we identified, we were also interested in understanding the joint effect of student inflow and outflow on districts and charter schools. That is, were some districts and charter schools experiencing high rates of loss via students leaving without similar rates of student inflow or vice versa? In our initial analysis, we found that in general, within the 27 city and suburban districts in metropolitan Phoenix, districts with high percentages of movers also had high rates of incoming students (Authors, 2012). To determine if this

pattern held with the statewide sample, we identified the districts that were in the lowest and highest quartiles for movement in and out of the district and cross-classified them, as shown in Table 3. Table 4 provides the characteristics of each group of schools.

Table 3
Cross-Classification of Districts by Mobility Quartiles

	School Districts	
	Low % Movers	High % Movers
Low % Incoming	22	3
High % Incoming	3	25

Just over half of the districts (25) that had the highest percentages of exiting students were also among the districts with the highest percentages of entering students, which we describe as high mobility districts. Similarly, half of the districts with the lowest percentages of exiting students also were among the districts with the lowest percentages of exiting students (low mobility districts). Few districts had very high rates of out-migration and low rates of in-migration or vice versa. Nine of the high mobility districts were small districts with fewer than 100 students in the sample; in only three of these a handful of students moved to a charter school within the CBSA. Most of the high mobility districts (80%) were rural districts, so the demographic characteristics of this group closely matched the profile of the rural districts in the sample, which were smaller and served higher percentages of White students than the full sample of districts.¹¹ On average, 80% of the exiting students in high mobility districts enrolled in another district or charter school within the CBSA, although there was a substantial amount of variation within the group.

¹¹ Descriptive statistics for rural districts available on request.

Table 4
Districts by Mobility Types

	High Mobility (N=25) Mean (S.D.)	Low Mobility (N=22) Mean (S.D.)
Students End 2007-08 (#)	1110 (1323)	1983 (3185)
Total Movers (#)	152 (179)	88 (171)
Students Beg. 2008-09 (#)	1113 (1334)	1985 (3187)
Total Incoming (#)	155 (186)	91 (174)
<i>Mobility Variables</i>		
Movers (%)	18.08 (26.06)	3.51 (1.53)
Movers to Local School Districts	66.40 (26.07)	38.26 (30.22)
Movers to Local Charter Schools	13.82 (17.97)	16.04 (22.56)
Incoming (%)	14.24 (3.51)	3.50 (1.65)
Incoming from Local School Districts	69.42 (30.38)	37.99 (32.66)
Incoming from Local Charter Schools	8.26 (10.60)	8.45 (11.09)
<i>Demographic and Achievement Variables</i>		
End of 2007-08 (%)		
White	49.36 (33.16)	41.46 (37.34)
Hispanic	5.41 (5.78)	.76 (1.03)
African American	41.30 (28.17)	45.56 (41.30)
American Indian	2.22 (2.70)	11.45 (25.44)
Asian American	1.72 (1.75)	.75 (.95)
Movers (%)		
White	54.04 (35.28)	36.11 (35.49)
Hispanic	6.62 (8.81)	.76 (2.00)
African American	34.83 (27.81)	36.90 (38.82)
American Indian	3.12 (4.48)	16.25 (29.38)
Asian American	1.40 (2.18)	.88 (1.56)
IEP (%)	14.03 (8.40)	26.48 (21.18)
IEP missing (%)	0	.09
FRL students (%)	51.76 (24.25)	59.36 (25.93)
FRL students missing	.16	.13
Mean NCE Reading	47.93 (6.82)	47.19 (6.56)
Mean NCE Language Arts	47.04 (4.77)	47.56 (6.05)
Mean NCE Mathematics	48.23 (5.66)	47.74 (6.52)
Achievement Missing	.24	.09
Locale		
City	2 (8)	3 (14)
Suburb	1 (4)	0
Town	2 (8)	10 (45)
Rural	20 (80)	9 (41)

In contrast, only three of the low mobility districts served fewer than 100 students, and two of these were extremely small districts with less than 10 students. Fifty-four percent of the students who left these districts moved to other districts or charter schools within the CBSA, which suggests that almost half of the students who moved left the local area. Low mobility districts also served a substantially higher percentage of American Indian students than the average for school districts, which indicates that many of these districts are located in or near reservations. On average, high and low mobility districts served a higher percentage of students with IEPs than the full sample of schools, but the percentage of students with IEPs in low mobility districts was more than twice the average of the full sample (see Table 1), which suggests that special education services may be an important factor keeping families enrolled in school districts. Conversely, on average high mobility districts served lower percentages of students receiving free and reduced lunch than the full sample, while low mobility districts served higher percentages of free and reduced lunch students.

Although low mobility and high mobility districts did not differ substantially in average achievement, both were slightly below the state average.¹² In general, student mobility to and from school districts was only weakly related to district achievement. If student mobility to and from districts was driven by district achievement, then we would expect the highest achieving districts to have the highest percentages of in-migration and the lowest percentages of out-migration, but this was not the case. For example, only 10 of the districts in the highest quartile for mathematics achievement were also among the districts with the highest percentage of incoming students. Finally, except for two small districts with fewer than 50 students in the sample the demographics of the highest mobility districts did not change substantially from 2007-08 to 2008-09.¹³ In these districts the movement of 10 students made a substantial difference (changes of five percentage points or more) in the distribution of students by race.

Charter Schools

In Table 5 we repeat the regression analyses we conducted on the school district sample with the charter school sample. As in the analyses shown in Table 2, the variables in the models predicting the percentage of movers (columns 1 and 2) were the characteristics of the charter schools the students were moving from, while the variables in the models for percentage of incoming students were the characteristics of the charter school students were moving to. Because we were missing information on the variables for the percent of students with an IEP and achievement, our final model is based on a reduced sample of 198 charter schools. As with the district sample, t-tests indicated that there were no differences between the full sample and the regression sample (see

¹² This pattern held when we looked at district achievement for the districts with the highest percentage of movers. Average mathematics achievement for these 37 districts was less than two percentage points lower than the remaining 125 districts (achievement data was not available for 15 districts).

¹³ For example, 54% of the students leaving high mobility districts were White, as were 57% of the students moving into the district. As a result, the demographics of eligible movers in this group of districts were virtually the same over the two periods we analyzed.

Appendix 1). In contrast to the school district models, the variables for percentage of movers and percentage of incoming students were statistically significant and mirrored each other, indicating that in general, students from charter schools with higher percentages of movers were moving to other charter schools. Likewise, charter schools with higher percentages of incoming students had higher percentages of students coming into the schools from other charter schools rather than school districts. As the percentage of Asian American students in a charter school increased, the percentage of students moving to another charter school increased, although this finding is difficult to assess given the relatively small percentages of Asian American students enrolled in Arizona’s school districts and charter schools.

The statistically significant coefficients for achievement could reflect the location of charter schools. Charter schools with higher percentages of incoming students from school districts tend to be located within or near the boundaries of lower achieving school districts, which is reflected by the negative coefficient for achievement and vice versa. Charter schools with higher percentages of incoming students from local charter schools tend to be located in or near districts with higher achievement. The positive coefficient for movement to school districts and the negative coefficients for movement to and from charter schools for charter schools located in towns and rural areas likely reflects the limited numbers of charter schools in these areas. Finally, the R² was relatively low for all models. Comparing across the regression models for school districts and charter schools suggests that there were different processes underlying student movement between districts compared to student movement between districts and charter schools.

Table 5
Regression Analyses Predicting Mobility from and to Charter Schools

	Movers to Local School Districts (%) (1)	Movers to Local Charter Schools (%) (2)	Incoming from Local School Districts (%) (3)	Incoming from Local Charter Schools (%) (4)
Constant	92.89*** (7.36)	14.14 (14.14)	117.89*** (18.22)	-5.17 (13.55)
Movers (%)	-.38* (.15)	.22+ (.12)		
Incoming (%)			-.37** (.13)	.32*** (.09)
Students End 2007-8	-.004 (.01)	-.005 (.01)	.0002 (.01)	-.002 (.01)
Hispanic	.01 (.08)	-.04 (.06)	-.05 (.09)	-.08 (.06)
African American	.27 (.21)	-.09 (.17)	.08 (.23)	.13 (.17)
American Indian	-.014	.07	-.009	.06

	(.11)	(.09)	(.12)	(.09)
Asian American	-.83+	.81*	-.68	.47
	(.44)	(.36)	(.48)	(.36)
IEP	-.14	-.09	-.51	-.20
	(.32)	(.26)	(.36)	(.28)
Mean NCE	-.32	.12	-.64*	.44**
Mathematics	(.23)	(.19)	(.25)	(.18)
suburb	4.44	-.07	-1.28	1.79
	(3.80)	(3.10)	4.22	(3.13)
town	-1.90	-11.27*	-3.29	-8.65*
	(5.31)	(4.32)	(5.91)	(4.39)
rural	8.76*	-15.04***	-.84	-5.53
	(4.45)	(3.62)	(4.90)	(3.64)
R ² (N=198)	.11	.19	.12	.22

As with the analysis of school districts presented above, we cross-classified the charter schools that were in the highest and lowest mobility quartiles. The patterns of mobility for charter schools mirrored those of the school districts. Forty-three percent of the charter schools that had the highest rates of out-migration also had the highest rates of in-migration. Likewise, half of the charter schools with the lowest rates of out-migration also had the lowest rates of in-migration. High mobility charter schools ranged from some extremely small schools (two enrolled fewer than 10 elementary school students who were eligible to re-enroll at the end of 2007-08) to the largest charter school in the sample, which served over 2,200 elementary school students in 2007-08. Low mobility charter schools ranged in size from one rural charter school that enrolled 10 elementary school students to another rural charter school with more than 1,500 students. In general, the rural charter schools had the lowest mobility rates, which could reflect the limited education markets in those areas. Most of the high mobility charter schools were located in urban areas, although five of the 25 (20%) were located in rural areas.

Table 6
Cross-Classification of Charter Schools by Mobility Quartiles

	Charter Schools			
	Low	%	High	%
	Movers		Movers	
Low % Incoming	30		5	
High % Incoming	4		25	

Compared to low mobility charter schools, high mobility charter schools served lower percentages of White and Asian American students and higher percentages of African American and Hispanic students. Both high and low mobility charter schools served higher percentages of students with IEPs than the full sample of charter schools;

however, high mobility schools served substantially higher percentages of students who were eligible for free and reduced lunch than the full sample and low mobility schools, which may be a function of locale as a majority of the high mobility schools were located in urban areas.

High mobility charter schools also had lower achievement than the full sample of charter schools and substantially lower achievement than low mobility charter schools (between 12 and 17 percentage points depending on the subject). This pattern is consistent with what we might expect if families are choosing schools based on student achievement. Yet fewer than half (39%) of the charter schools in the lowest quartile for achievement were among the schools with the highest rates of outgoing students. Likewise, only 12% of the lowest achieving charter schools were among the schools with the lowest rates of incoming students, which suggests that families' choices of charter schools are not primarily driven by quality as measured by student achievement. Because many of the high mobility charter schools were small (19 of the 25 served 100 or fewer elementary students), the movement of a few students could substantially change the demographics of a school or group of schools from one year to the next. That said, as a group, the only major change in demographics was that the highest mobility charter schools served approximately four percent fewer White students and the percentage of Hispanic students they served increased by approximately the same amount.

Table 7
Charter Schools by Mobility Types

	High Mobility (N=25) Mean (S.D.)	Low Mobility (N=30) Mean (S.D.)
# Students End 2007-08	165 (446)	371 (350)
# Students Beg. 2008-09	180 (463)	361 (339)
Percent Movers	41.66 (11.65)	8.01 (3.59)
% Moving to Local School Districts	55.31 (26.10)	66.19 (25.69)
% Moving to Local Charter Schools	19.53 (17.28)	18.36 (19.02)
Percent Incoming	45.15 (13.58)	6.15 (2.77)
% Incoming from Local School Districts	61.13 (26.26)	67.24 (28.36)
% Incoming from Local Charter Schools	18.12 (19.11)	20.80 (21.32)
End of 2007-08		
% White	54.40 (26.10)	66.10 (30.39)
% African American	8.40 (7.54)	2.94 (3.03)
% Hispanic	25.95 (21.70)	18.65 (24.29)
% American Indian	8.14 (12.20)	7.85 (24.19)
% Asian American	3.11 (3.75)	4.46 (5.02)
Movers		
% White	54.30 (26.92)	64.42 (33.86)
% African American	7.49 (9.20)	2.64 (4.09)
% Hispanic	23.20 (21.82)	18.38 (23.24)
% American Indian	12.57 (18.32)	5.87 (20.14)
% Asian American	2.44 (5.04)	5.36 (10.03)
IEP (%)	12.19 (7.70)	13.13 (20.63)
IEP missing	.12	.03
FRL students (%)	54.76 (27.37)	31.94 (31.54)
FRL students missing	.20	.23
Mean NCE Reading	45.23 (7.73)	58.13 (10.12)
Mean NCE Language Arts	45.96 (8.29)	57.78 (10.39)
Mean NCE Mathematics	42.02 (7.75)	58.53 (11.34)
Achievement Missing	.20	.03
Locale	N (%)	N (%)
City	16 (64)	11 (37)
Suburb	2 (8)	7 (23)
Town	2 (8)	4 (13)
Rural	5 (20)	8 (27)

CBSA Analysis

Our final analysis compared district mobility and charter school mobility within and across the three CBSAs where the largest numbers of students in the state reside: Phoenix-Mesa-Scottsdale, Tucson, and Yuma. These three CBSAs served 86% of the students attending traditional public schools in Arizona. We provide descriptive statistics for the school districts and charter schools within the CBSA. We also created maps of the CBSAs showing the districts and charter schools in our samples using

ArcGIS. The maps depict the districts and charter schools within each CBSA; the districts are shaded based on the average of percent movers and percent incoming.¹⁴ This analysis allowed us to better understand and compare the spatial dimensions of three very different educational markets, and visually represent the relationship between charter school location and interdistrict mobility (Lubienki & Lee, 2017) in a way that cannot be captured in a table of descriptive statistics. However, the descriptive statistics also helped us interpret some of the patterns we identified using the maps.

¹⁴ The scale of the mobility variable on the three maps is different because district mobility varied across the three CBSAs.

Table 8
Descriptive Statistics by CBSA and Sector

	Phoenix-Mesa-Scottsdale		Tucson		Yuma	
	Districts (N=64)	Charters (N=139)	Districts (N=14)	Charters (N=41)	Districts (N=8)	Charters (N=3)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
# Students End 2007-08	5095 (6322)	216 (286)	4392 (7010)	159 (163)	1999 (2389)	286 (232)
# Students Beg. 2008-09	5080 (6300)	220 (283)	4378 (6876)	162 (169)	1990 (2363)	305 (238)
Percent Movers	9.86 (4.49)	22.55 (11.72)	6.96 (2.70)	22.88 (12.62)	5.42 (1.92)	10.81 (3.54)
% Moving to Local School Districts	73.63 (18.98)	69.29 (18.88)	60.53 (20.02)	58.25 (26.52)	69.40 (16.99)	85.05 (2.18)
% Moving to Local Charter Schools	15.25 (11.22)	23.57 (14.84)	16.29 (8.68)	27.54 (23.22)	9.09 (10.43)	6.86 (8.71)
Percent Incoming	9.98 (4.05)	24.61 (18.28)	7.31 (1.75)	21.45 (13.76)	4.93 (2.87)	21.27 (14.14)
% Incoming from Local School Districts	75.17 (17.92)	71.54 (20.28)	65.46 (17.05)	60.49 (28.25)	79.19 (19.36)	89.03 (11.14)
% Incoming From Local Charter Schools	12.52 (9.49)	23.12 (18.64)	14.57 (8.24)	21.85 (21.22)	4.49 (5.83)	3.60 (5.17)
End of 2007-08						
% White	36.84 (27.18)	54.62 (27.42)	44.24 (23.97)	46.92 (26.65)	17.88 (12.58)	34.86 (23.30)
% African American	5.67 (4.56)	9.20 (8.93)	2.73 (2.01)	5.53 (4.78)	.92 (1.19)	3.31 (.79)
% Hispanic	50.63 (26.53)	27.78 (24.19)	40.25 (22.52)	38.57 (26.66)	79.34 (12.88)	55.72 (27.80)
% American Indian	4.73 (12.27)	4.94 (15.20)	10.34 (25.85)	5.33 (14.99)	1.42 (1.23)	2.98 (1.85)
% Asian American	2.14 (1.90)	3.46 (4.12)	2.44 (3.04)	3.64 (4.02)	.44 (.77)	3.14 (3.72)
IEP (%)	12.13 (4.17)	8.67 (8.90)	13.88 (4.29)	11.96 (13.23)	10.32 (2.50)	8.22 (2.80)
IEP missing	0	.05	.07	.10	0	0
FRL students (%)	52.90 (27.74)	43.27 (29.13)	37.90 (32.91)	54.78 (29.63)	79.48 (14.55)	63.91 (19.05)
FRL students missing	.09	.35	.21	.39	.13	0
Mean NCE Reading	47.64 (7.23)	51.97 (10.14)	52.38 (8.94)	52.53 (12.50)	45.02 (5.36)	48.42 (5.15)
Mean NCE Language Arts	47.63 (7.14)	52.42 (10.29)	52.08 (8.59)	52.62 (11.91)	47.43 (4.56)	49.58 (6.19)
Mean NCE Mathematics	48.29 (7.26)	51.76 (11.02)	53.25 (9.59)	52.58 (13.45)	47.78 (4.53)	47.56 (5.59)
Achievement missing	.02	.14	.07	.15	.13	0
Locale	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
City	20 (31)	87 (63)	2 (14)	31 (76)	2 (25)	3 (100)
Suburb	7 (11)	31 (22)	5 (36)	7 (17)	0	0
Town	6 (9)	3 (2)	1 (7)	1 (2)	2 (25)	0
Rural	31 (48)	18 (13)	6 (43)	2 (5)	4 (50)	0

Phoenix-Mesa-Scottsdale. In the Phoenix-Mesa-Scottsdale CBSA, there are 64 districts that range from small rural districts serving fewer than 100 students, small central city elementary districts that serve between 1,200 and 20,000 students and large unified districts serving 25,000 students or more. There are 11 small elementary districts in the central city area that feed into a single high school district. Four other elementary districts classified by the U.S. Census Bureau as city districts send students to high school districts with attendance boundaries that cross the Phoenix city limits. The five remaining city districts located north and east of the central city area are larger unified districts. Figure 1 illustrates how charter schools in the Phoenix-Mesa-Scottsdale CBSA are fairly evenly distributed across the central city area and within the largest district in the CBSA, the Mesa Unified School District. The map also highlights how there are relatively few charter schools in some of the districts with the highest mobility shown in blue, as well as a substantial number of charter schools distributed across in the lowest mobility districts, which are shown in yellow.

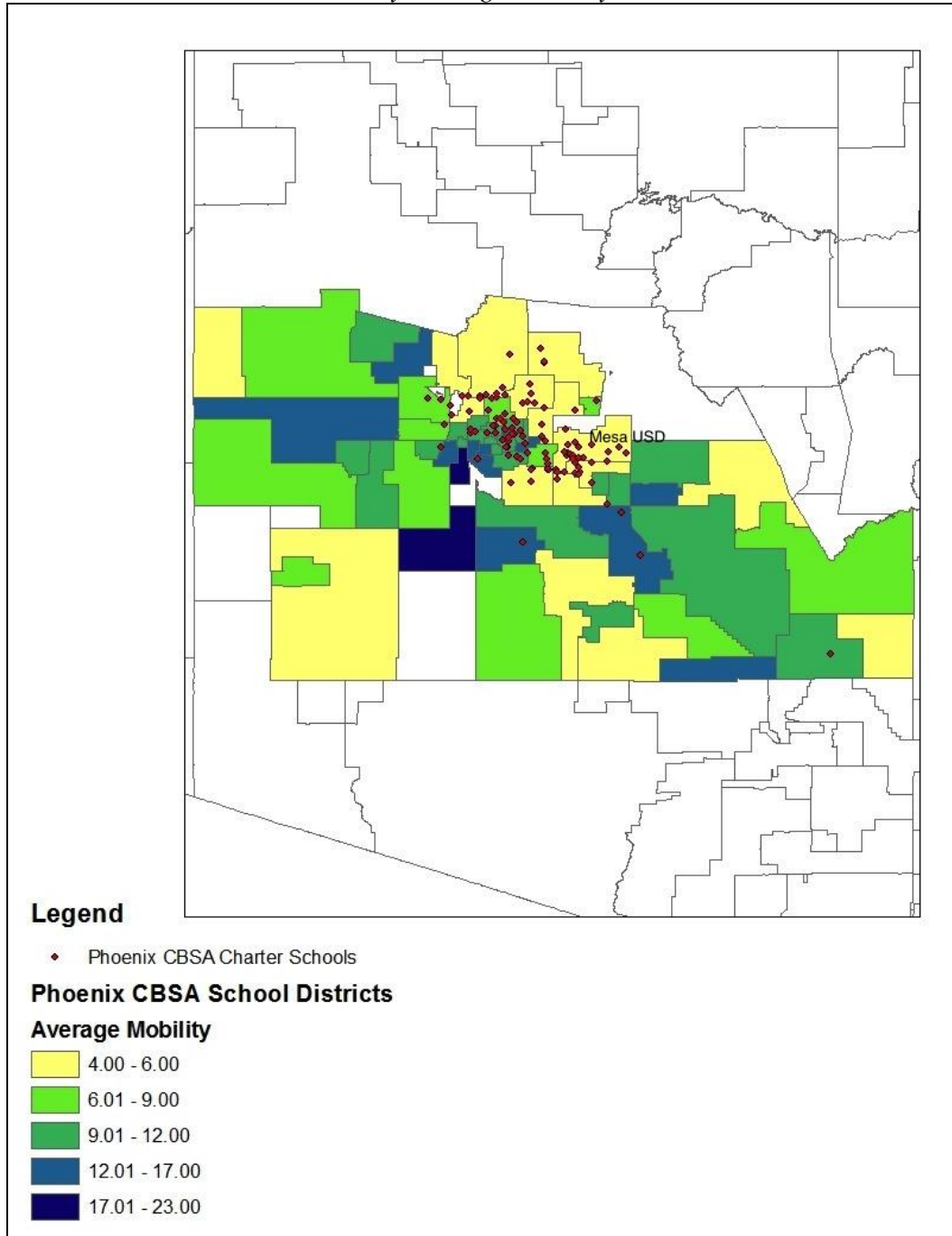
To provide a snapshot of the range of student movement patterns within the CBSA, we compared movement patterns to and from the 15 elementary districts with those of the three unified districts that are classified as large city districts in the CCD. The two groups of districts had very different demographic profiles. In Arizona's public schools, the two largest demographic groups are Whites and Hispanics, which were fairly evenly represented in the districts and charter schools included in our analysis. The 15 elementary districts were predominantly Hispanic in 2007-08 (69% on average), while the unified districts were majority White (71%). Likewise, the elementary school districts served a much higher percentage of free and reduced lunch students (70%) than the unified districts (25%). On average, 11% of the students attending schools in the central city elementary districts in 2007-08 moved to other districts or charter schools at the beginning of 2008-09. Virtually all of these students moved within the CBSA; most (82%) moved to other districts and another 13% moved to charter schools. The figures for incoming students to the districts were roughly the same although the average rate of incoming students from charter schools was slightly lower (11%). The unified districts had lower overall rates of movement out of the districts (five percent on average) and while 92% of the movers went to districts or charter schools within the CBSA, they moved to charter schools at a much higher rate (22%). As with the elementary districts, the figures for incoming students mirrored those of the outgoing students. Overall, these patterns indicate that the unified districts in the Phoenix metropolitan area tended to serve more advantaged students who are more likely to engage in active choice.

While we found similar differences between the elementary and unified districts in the much smaller (seven in total) group of suburban districts in the CBSA, within the rural districts there did not seem to be a clear difference

between the movement patterns of elementary and unified districts. On average, the rates of movement in and out of the rural districts were similar to the city elementary districts (10% and 11%, respectively), although comparatively fewer (85%) of the students attending rural districts moved within the CBSA. Both rural and suburban districts were more diverse than their central city counterparts. While the percentage of Hispanic students was slightly higher than the percentage of White students in both groups of districts, neither group was a majority. Except for rural charter schools, which had lower average rates of out-migration (17%) and higher rates of in-migration (25%) than all charter schools in the CBSA, we did not find any clear differences in the mobility patterns across groups of charter schools when we divided them by locale.²¹

²¹ The pattern was the reverse for the three charter schools located in areas classified as towns by the U.S. Census Bureau but it is difficult to draw firm conclusions from such a small group of schools.

Figure 1
Phoenix CBSA School Districts by Average Mobility and Charter Schools

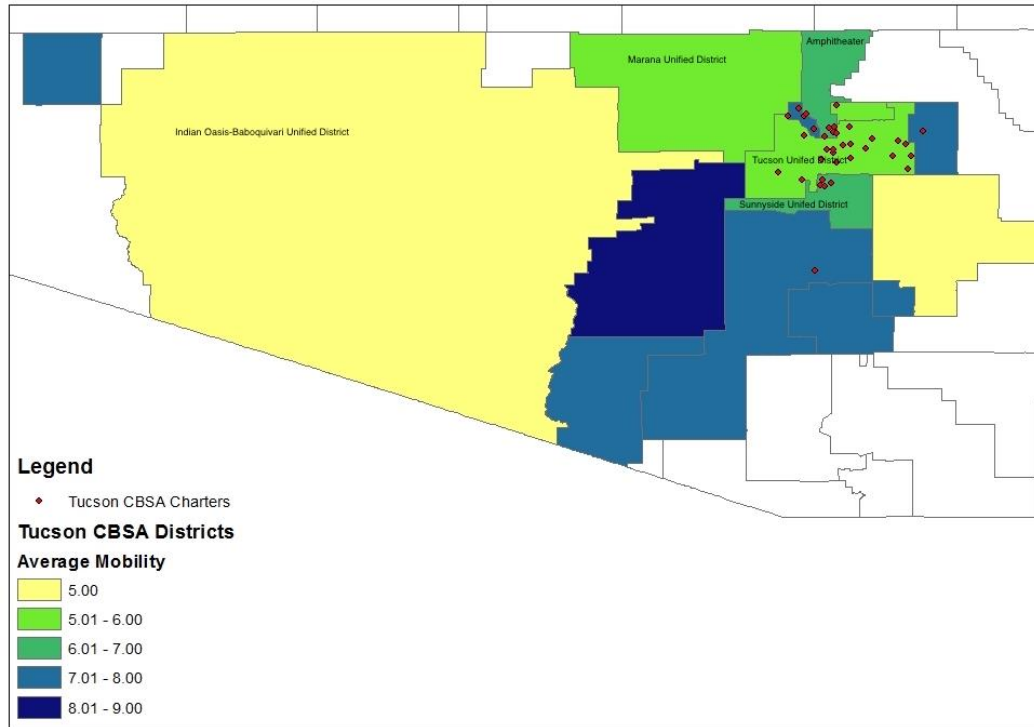


Tucson. Most of the charter schools in the Tucson CBSA are located within the Tucson Unified School District (TUSD). There are smaller numbers of charter schools within the unified school districts that adjoin TUSD: Sunnyside, Flowing Wells, and Amphitheater (see Figure 2). TUSD, Sunnyside and Amphitheater served the largest numbers of students in the CBSA. While it did not have the highest percentage of students leaving the district, 32% of the students who left TUSD at the end of 2007-08 attended charter schools within the CBSA in 2008-09. While TUSD's rate of incoming students was slightly lower than the rate of outgoing students, close to the same share (28%) of those incoming students left charter schools to attend traditional public schools in TUSD. Not surprisingly, given the number of charter schools within and near its borders, TUSD had the highest rates of charter school in-migration and out-migration within the CBSA. The mobility patterns for the surrounding districts were similar but not as extreme – relatively high rates of out-migration to charter schools and similar rates of in-migration from charter schools.

Unlike the Yuma and Phoenix CBSAs, on average the districts in the Tucson CBSA served approximately the same percentages of White and Hispanic students as the charter schools. The school districts in the Tucson CBSA served a substantially higher percentage of American Indian students than the charter schools. One of the state's largest American Indian reservations is located within the Indian Oasis-Baboquivari Unified School District, a rural district that is geographically distant from the urban center where charter schools are concentrated (see Figure 2). In 2007-08, 97% of the students in the sample attending schools in Indian Oasis were American Indian.²² Finally, also unlike Yuma and Phoenix, average student achievement was approximately the same in the districts and charter schools within the Tucson CBSA, although the higher standard deviation for the charter schools indicates that there was greater variation in achievement within the charter schools in the CBSA than there was across the school districts.

²² Because there were a substantial number of districts and charter schools missing information on the percentage of free and reduced lunch students served, it is difficult to draw clear cross-sector comparisons on that variable.

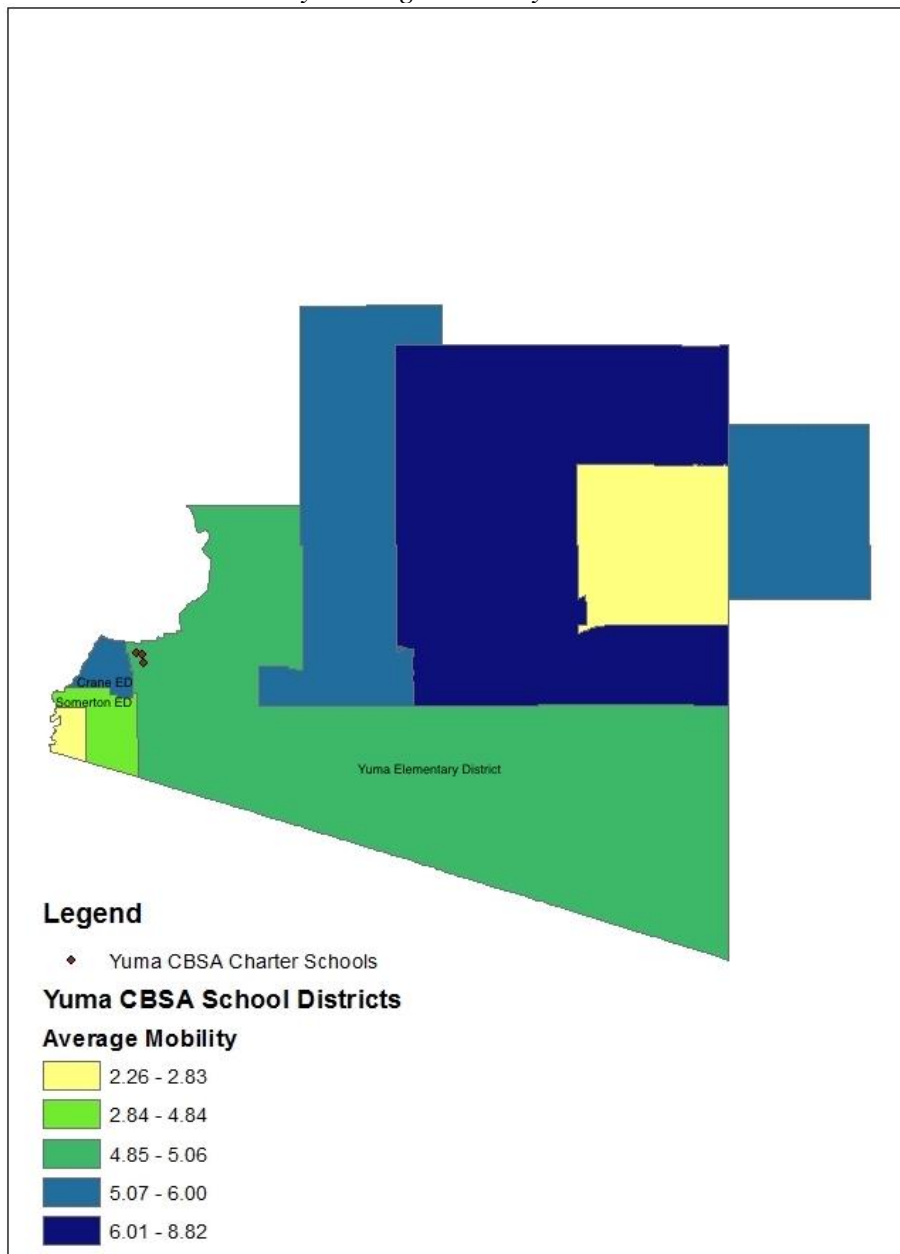
Figure 2
Tucson CBSA School Districts by Average Mobility and Charter Schools



Yuma. Of the three CBSAs, the Yuma school districts and charter schools had the lowest mobility rates. While the charter schools appear to have a high rate of incoming students, given that they served 5% of the elementary students in the sample in 2007-08, the number of students moving to charter schools is fairly small. Within the Yuma CBSA, the three districts with the highest average mobility (shown in blue in Figure 3) were also the districts with the highest percentage of students leaving the districts (movers) and did not have any students leave for charter schools or enter the district from charter schools. This is likely because they were geographically distant from the charter schools in the CBSA. Because these were among the smallest districts in the CBSA in terms of enrollment, the absolute numbers of students leaving and entering the districts was low. In the four largest districts in the CBSA, between 11% and 24% of their movers left to attend charter schools. However, between five and 16% of their incoming students entered from charter schools. These districts adjoin one other in the Southwest corner of the state. As Figure 3 highlights, the three charter schools in the sample are clustered within two miles of one another in the Yuma Elementary District near the border of the Crane Elementary District, and within 10 miles of the other two districts' borders. Finally, the demographics of the two sectors varied considerably. While only 17% of the students attending public

schools in the school district were Hispanic, 35% of the charter school students were White. Likewise, the three charter schools served a substantially lower percentage of free and reduced price lunch students (64% on average) than the school districts (79%).

Figure 3
Yuma CBSA School Districts by Average Mobility and Charter Schools



In all three CBSAs, charter schools served a higher percentage of African American students than the school districts although their overall representation in the sample was low. In both Yuma and Phoenix, the charter schools served a substantially higher percentage of White students and a substantially lower percentage of Hispanic students, which may be an outcome of White flight to charter schools in these education markets. As in our previous analyses, the demographics of eligible re-enrollees in these school districts and charter schools changed very little from 2007-08 to 2008-09.

Discussion

While most analyses tend to focus on understanding the effects of a single school choice policy such as student movement from traditional public schools to charter schools, we assessed how students move between different sectors of the public school market in Arizona, a state with long-standing public school choice policies. By analyzing interdistrict and charter school mobility simultaneously, we provide a more nuanced understanding of the complex dynamics of public school choice. Not only do patterns of student movement to and from charter schools differ from movement between school districts, but public school choice policies also affect districts in varied, yet systematic ways. That said, the use of enrollment data provides only suggestive insights into the motivations behind these enrollment decisions – namely, whether the mobility patterns explored above were the result of active or reactive school choice.

Our basic finding across these analyses is that even in a state with a well-established charter school movement, most student movement is interdistrict mobility or movement between school districts. Given that the charter school sector in Arizona is small relative to the traditional public school sector and charter schools are not evenly distributed across the state, this is not surprising. Although proportionally, charter schools tend to have higher rates of students leaving or entering schools than school districts, in absolute terms, these are relatively small numbers of students. The average charter school received 24 students at the beginning of the 2008-09 academic year from school districts within the CBSA and eight students from local charter schools. In contrast, on average 179 students left school districts for other districts or charter schools within the CBSA: 142 to school districts and 37 to charter schools. In both cases, the figures for incoming students mirror those of outgoing students. Thus, the type of public school choice that is the most well-known and receives the most attention from policymakers is not the dominant form of school choice in Arizona. In most districts, over half of exiting and entering students move within the CBSA. This suggests that, to the extent they are competing for student enrollment, school

districts are largely competing with other school districts rather than charter schools. In Arizona, interdistrict mobility has played a greater role in creating and sustaining the “educational market” than charter schools. Because students may move between school districts within a CBSA because of household changes that prompt a school move, we cannot definitively attribute this form of student movement to active choice.

While in some districts a substantial percentage of students leave to attend charter schools, students are also leaving charter schools to attend traditional public schools at roughly similar rates. That is, mobility between charter schools and school districts is two-way. While charters schools may attract students away from traditional public school districts when they are initially enrolling in schools, in general, charter school students are a fairly mobile group and most students who leave charter schools enroll in school districts. Yet in absolute terms this is a small number of students. Although there is considerable variation in student mobility between districts and charter schools, overall these patterns of student movement did not alter what are by now well-established patterns of stratification within and across each sector.

Our regression analyses, which assessed the relationships between school characteristics and the different types of student movement, suggest that demographic characteristics and student achievement are more strongly related to movement to and from school districts than charter schools. Our findings suggest that student mobility in school districts serving large percentages of minority students is likely motivated by reactive mobility rather than active choice. Conversely, special education services may be a pull factor that encourages families to remain enrolled in school districts.

The cross-classification of schools by degree of mobility further illuminates the patterns we identified in our regression analyses, and specifically, the finding that in both sectors, mobility tends to be two-way rather than a pattern that suggests competition (Authors, 2012). Some of the differences we observed between the two sectors are likely attributable in part to location. High mobility districts were predominantly small rural districts that ranged widely in size from extremely small (serving fewer than 100 elementary school students) to above average. Finally, the CBSA analysis highlights regional differences in patterns of mobility and how education markets vary considerably within and across local contexts. It also indicates that many districts with relatively high mobility rates do not have a strong charter school presence, which again underscores how most student movement in Arizona is between public school districts. Mapping district mobility patterns in relation to charter school location also highlighted how it is important to pay attention to the geospatial dimensions of school choice.

Conclusion

While our study focuses on the educational marketplace in Arizona, a state with a long history of supporting student choice options and policies, our findings have relevance for policymakers and practitioners beyond the Arizona context. First, our study indicates that the patterns we identified for metropolitan Phoenix in our earlier study were also evident statewide and within other local markets (Authors, 2012). Our simultaneous analysis of interdistrict and charter school mobility suggests that Arizona's open enrollment policy may have a greater effect on student enrollment decisions and student mobility than simply the presence of charter schools alone because the movement between districts is proportionately larger than the movement to and from charter schools. It is likely that this pattern is not unique to Arizona but will be evident in other states that have interdistrict choice policies and charter schools operating simultaneously, a finding that has relevance for policymakers in other contexts. In other states with multiple school choice policies such as Michigan and Ohio, and in particular those with mandatory open enrollment (Education Commission of the States, 2018), it is likely that open enrollment will have a greater effect on student enrollment decisions and student mobility than charter schools alone.

Second, patterns of mobility vary considerably across districts. Districts with higher rates of in- and out-mobility may find it useful to work with neighboring districts to mitigate the effects of these two-way patterns of student mobility, which include the fiscal consequences of declining enrollments and the challenges of educating students that move frequently between districts and sectors. Third, the analysis also highlights how a substantial number of students move from charter schools back into traditional public school settings, an understudied phenomenon. This between-sector movement may be important for researchers interested in understanding how school choice works in other settings to address in their analyses (Author, 2017). We need to better understand the characteristics of charter schools with high mobility rates as well as the characteristics of students who leave charter schools to return to traditional public schools and how these movements shape their educational careers. Fourth, our findings reinforce the findings in previous studies of school choice programs and charter schools that low-income and minority students are more likely to move in and out of lower-performing charter schools and school districts. Finally, in this study we are only able to address patterns of student movement but we do not know the motivations of families that underlie these patterns. To fully understand how families engage with school choice policies, researchers, policymakers, and practitioners need to better document and analyze the reasons for student mobility before we can conclude that these enrollment patterns reflect families' active use of market-based school choice policies.

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Appendix 1

Table A1

Descriptive Statistics by Sector for Regression Samples

	School Districts (N=161) Mean (S.D.)	Charter Schools (N=198) Mean (S.D.)
Students End 2007-08 (#)	2853 (4972)	204 (250)
Total Movers (#)	224 (324)	38 (59)
Students Beg. 2008-09 (#)	2845 (4941)	206 (249)
Total Incoming (#)	215	39 (68)
Percentage difference	-.21 (4.66)	11.01 (111.43)
<i>Mobility Variables</i>		
Movers (%)	8.58 (4.63)	21.31 (11.01)
Movers to Local School Districts	55.72 (28.03)	67.56 (20.33)
Movers to Local Charter Schools	12.76 (13.38)	22.20 (17.29)
Incoming (%)	8.32 (3.97)	21.79 (15.28)
Incoming from Local School Districts	56.16 (28.51)	68.55 (22.53)
Incoming from Local Charter Schools	10.31 (10.23)	20.28 (17.83)
<i>Demographic and Achievement Variables</i>		
End of 2007-08 (%)		
White	44.09 (28.74)	55.60 (28.21)
Hispanic	41.23 (28.51)	29.42 (25.92)
African American	3.14 (3.78)	6.75 (7.53)
American Indian	10.08 (23.48)	4.96 (14.62)
Asian American	1.47 (1.79)	3.25 (3.85)
Movers		
White	46.10 (28.96)	55.36 (28.18)
Hispanic	35.46 (27.08)	28.73 (25.70)
African American	4.27 (5.91)	7.32 (9.77)
American Indian	12.03 (24.50)	4.85 (13.85)
Asian American	1.51 (2.88)	3.73 (7.31)
IEP (%)	12.60 (4.24)	8.78 (5.37)
Mean NCE Mathematics	49.83 (7.23)	51.54 (11.21)