



# Direct and indirect impact of charter schools' entry on traditional public schools: New evidence from North Carolina



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## HIGHLIGHTS

- Estimate the causal impact of school choice programs on student achievement.
- Separately identify direct impact and indirect impact at the grade level.
- Find a positive and significant direct impact on student achievement.
- Demonstrate such positive effects were significantly undervalued in the literature.

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## ABSTRACT

This paper examines the effects of charter schools on student achievement at neighboring traditional schools. The study shows that charter school entry does not induce indirect impact on non-overlapping grades but generates positive direct impact on overlapping grades. I also demonstrate that such positive effects would have been significantly undervalued in prior studies, since they do not distinguish between the two impacts.

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## 1. Introduction

School choice programs have played a key role in public education reform in the United States over the past several years. Such programs introduce market mechanisms into public education and allow students to easily switch from their current school to an alternative public school, generating strong pressure on schools to avoid losing students and public funding. While there are a wide variety of school choice programs, charter school policies have been rapidly growing since 1991, when Minnesota enacted the nation's first charter school legislation. In 2013, 6.3% of all public schools nationwide were charter schools, and this figure is expected to further increase in the future (The National Alliance for Public Charter Schools).

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Like traditional public schools, charter schools are publicly funded and free to all students.<sup>1</sup> Unlike traditional schools, however, charter schools are not geographically restricted by school district or attendance zone. Wherever they live, parents are able to enroll their children in any charter school rather than an assigned traditional school.<sup>2</sup> In this regard, charter schools provide parents and children with an alternative choice to traditional schools and thus have a potential to improve the quality of neighboring traditional schools through competition. If traditional-school students leave for charter schools, traditional schools will lose public funding; this is the financial pressure

<sup>1</sup> Charter schools are typically exempt from a number of local regulations and have considerable freedom in personnel and curricular decision-making. However, charter schools can be closed due to poor student performance or financial mismanagement.

<sup>2</sup> Charter legislations vary from state to state; some states allow students to attend a charter school only across attendance zones, while other states allow attendance even across school districts. If oversubscribed, charter schools are required to select students by lottery.

**Table 1**  
The number of schools by grade in North Carolina in 2010.

	Lowest grade	Highest grade	Traditional public school		Charter school	
			Number	Percentage	Number	Percentage
Elementary	Pre-K	5	459	19.0	0	0.0
	K	5	616	25.5	9	9.4
Middle	6	8	405	16.8	4	4.2
High	9	12	437	18.1	7	7.3
Combined	Pre-K	6	40	1.7	1	1.0
	Pre-K	8	46	1.9	1	1.0
	K	6	23	1.0	2	2.1
	K	8	28	1.2	41	42.7
	K	12	13	0.5	17	17.7
	5	8	21	0.9	1	1.0
	6	12	45	1.9	2	2.1
	7	12	13	0.5	0	0.0
	Other	Other	265	11.0	11	11.5
Total	–	–	2411	100	96	100

Note: Grade Pre-K indicates pre-kindergarten, while K indicates kindergarten. The numbers of schools for traditional schools and charter schools include only regular schools. Alternative schools or vocational schools are excluded.

that traditional schools face when a charter school opens in their neighborhood and that policymakers hope will induce additional effort from traditional schools.

To date, no consensus has been reached regarding the direction, let alone the existence, of the effects of charter schools on neighboring traditional schools, as the literature on this topic finds conflicting results: positive effects (Booker et al., 2008; Hoxby, 2004; Holmes et al., 2003; Sass, 2006; Winters, 2012), no effects (Bettinger, 2005; Bifulco and Ladd, 2006; Buddin and Zimmer, 2009), and negative effects (Imberman, 2011) on student test scores at traditional schools.<sup>3</sup> But more importantly, these studies have potentially resulted in biased estimates by not separating two distinct effects of charter schools on traditional schools: direct impact and indirect impact.

In this paper, I propose a new empirical approach to identify the impact of charter schools on local traditional schools. Specifically, I define *direct impact* as the effect of introducing charter schools on traditional-school students in grades that overlap with charter schools' grades, while *indirect impact* is defined as the effect on students in non-overlapping grades. Unlike prior research work, which estimates the effects of charter school entry at the school level, I examine the effects at the grade level by exploring the variation in gaps between grades offered by charter schools and grades at nearby traditional schools. In fact, at their inception, charter schools tend to be small-sized schools that expand their grade ranges over years. Thus, when charter schools are introduced, grade ranges are not likely to overlap entirely between charter schools and traditional schools. Some traditional-school grades have their counterparts at charter schools, while others do not.

Separating the direct and indirect impact is critical to consistently estimate the effects of charter schools, since traditional-school students are not equally affected by the introduction of charter schools. For example, when a charter school opens with grades kindergarten (K) through 3, a neighboring K–5 traditional school will compete only for students at grades K through 3. Although the charter school operates in their neighborhood, traditional-school students at grades 4 and 5 have no choice but to stay at the current school. Therefore, to the extent that the direct and indirect impacts are distinct, examining the effects of charter school entry at the school level, as in other related studies, is bound to introduce bias to the ultimate impact of charter schools.

Using student-level panel data from North Carolina, this paper shows that the introduction of charter schools does not induce any significant indirect impact on non-overlapping grades but generates a positive and significant direct impact on student achievement at overlapping grades. I also demonstrate that such positive effects would have been undervalued by as much as 48% in the literature, since previous work identifies the impact of charter school entry at a moment when the direct and indirect impacts are likely to be mixed. My approach in this paper brings new insight into the controversial literature and contributes to a better understanding of charter-school effects.

## 2. Charter schools in North Carolina

North Carolina, which is known for public education reforms, opened its first charter school in the 1997–1998 school year (1998 hereafter), and as of 2010 there were ninety-six charter schools in the state. Table 1 illustrates the numbers and proportions of traditional schools and charter schools in 2010 by grade-levels. In North Carolina, there is a huge variation in grade levels that both types of schools offer. While many elementary schools have grades that begin from pre-kindergarten (Pre-K) or kindergarten (K) and terminate at grade five, other schools have grades up to six or eight. Middle schools and high schools also demonstrate a similar pattern; although their grade ranges are traditionally 6–8 and 9–12, respectively, some schools have different grade ranges.

Regarding the grades offered by charter schools, a unique feature is that they expand their grades over time. Table 2 shows the average lowest and highest grades of charter schools, demonstrating that they are likely to expand their grades upward over years. Another debate on charter schools surrounds political regulations. The charter school law in North Carolina limited the number of charter schools to a total of one hundred. As a result, few charter schools have been allowed to open for the past several years, when the quota was almost reached. The reason for this cap on charter schools is the controversy over whether charter schools improve or harm the quality of neighboring traditional schools. Therefore, assessing the impact of charter schools is particularly informative for North Carolina.

## 3. Data

This paper accesses two kinds of datasets in North Carolina through the North Carolina Education Research Data Center. The first dataset is End-of-Grade (EOG) which includes student test scores as well as other student characteristics such as parent

<sup>3</sup> Using data from school choice programs in Chile and Britain, respectively, Hsieh and Urquiola (2006) and Clark (2009) find no evidence that choice improved student achievement.

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