

The Effects of School Choice on Academic Achievement in the Netherlands

Oliver Himmler

Chair of Public Economics, Goettingen University, Platz der Goettinger Sieben 3, 37073 Goettingen, Germany



Abstract

Nationwide school choice and fixed per-student governmental funding provide incentives for Dutch schools to perform well. Employing data from the Inspectorate of Education, I find a positive link between competition intensity and academic achievement in Dutch pre-university education VWO. Roughly one third of VWO-schools are of catholic denomination. Acknowledging this widely available opportunity of opting out of the public school system, I consider the effect of catholic competition on non-catholic school performance. In addition to raising academic achievement, competition also exerts a restraining effect on per student spending, yet it does not precipitate grade inflation.

The Dutch Education System and Catholic Schools

- There are **no catchment areas** (nationwide school choice)
- Schools are funded via a fixed per-student transfer: **quasi voucher**
- **Schools may be shut down** when enrolment drops below a threshold
- **Market entry**: minimum number of pledged students needed
- **No tuition fees** (officially)

70% of Dutch secondary schools are private (i.e. they are non-government **run**). 50% of these are catholic. Dutch Catholic schools have been shown to outperform other schools even after controlling for student intake (Levin 2002). This research considers the effects of catholic competition on non-catholic-school outcomes.

Table 1: Summary statistics dependent variables

Variable	N	Mean Cath.	Std. Dev	N	Mean non-cath	Std. Dev
Central grade	180	64.518	2.145	585	63.993	2.926
Grade inflation	180	4.095	2.033	585	4.873	2.630
Per student spending	86	5797	1453	292	5971	1191

Outcome variables

The dependent variables are **centralized exam scores** and **grade inflation**. The measure of grade inflation is $\Delta G_{ij} = G_{ij}^s - G_{ij}^c$ where G_{ij}^c denotes the average centraal examen grade and G_{ij}^s the average school examen grade in school i in district j . The school grade G_{ij}^s is governed by locally defined standards. An upward deviation of G_{ij}^s from G_{ij}^c then constitutes a local standard that falls short of the central standard and is thus equivalent to grade inflation.

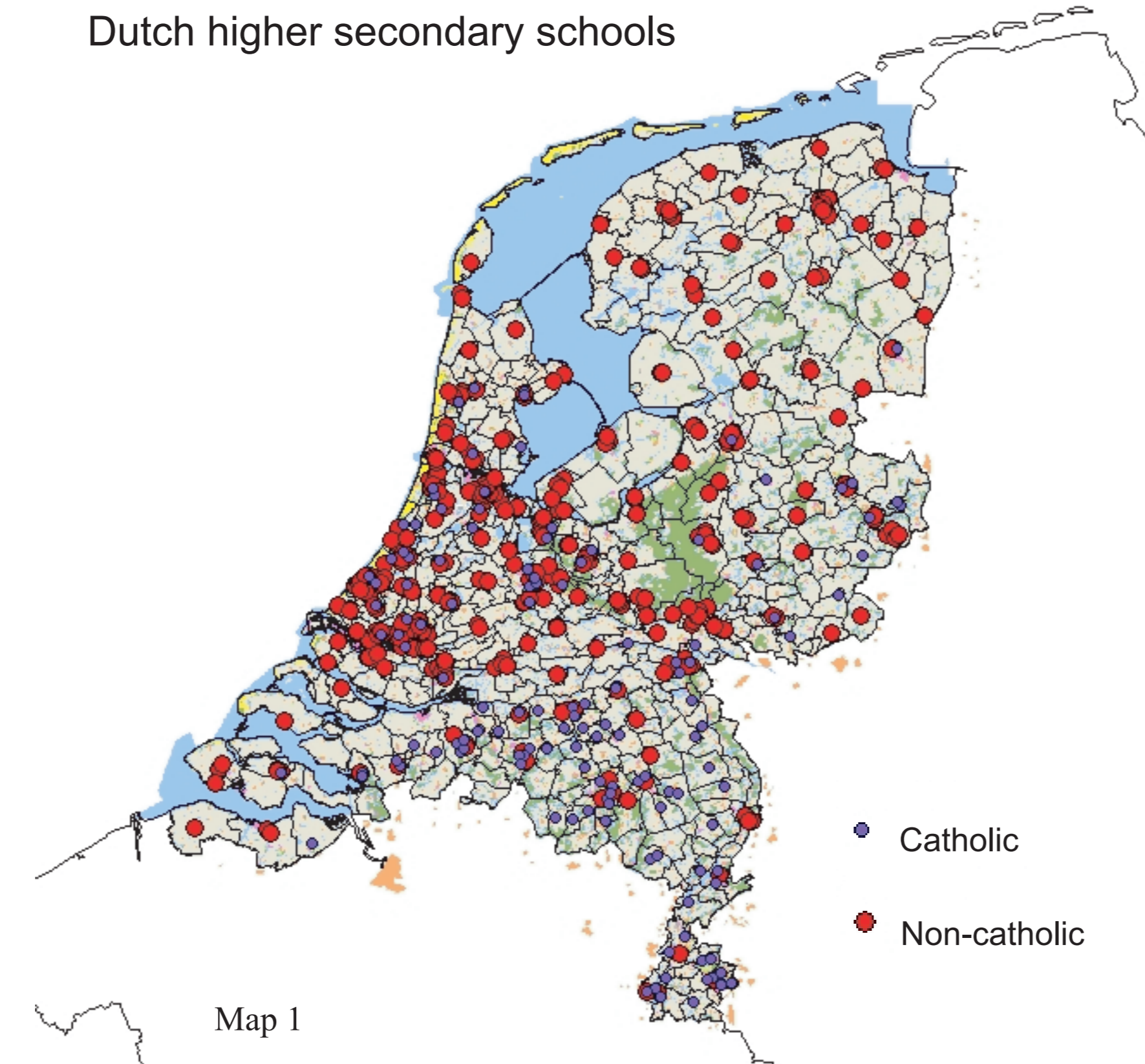
Table 1 shows outcome variable descriptives for catholic and non-catholic schools. Grades range from 0 to 100 but as these are school aggregates, the range is more like 60 to 80.

Measures of Competition

In the absence of catchment areas, the geographic definition of an education market is unclear. Several measures are employed:

- (1) A standard Herfindahl index of enrolment
- (2) Distance to nearest catholic school
- (3) Number of catholic schools within 15km
- (4) Number of catholic schools in gemeente (local jurisdiction)

Dutch higher secondary schools



Map 2 shows the variation of measures. As most students attend school within gemeente of residence, **measure (4) seems most reasonable**. Table 2 shows descriptive statistics for the competition indicators.

Measuring Competition:

- 1 Catholic School in Gemeente
- 3 Catholic Schools within 15km
- 5km to nearest Catholic School

Map 2

Table 2: Descriptive statistics non-cath. schools

Variable	N	Mean	Std. Dev.	Min	Max
km to nearest cath. VWO school	588	12.093	17.272	0	78.070
km to nearest VWO school	588	2.326	3.233	0	17.281
No. cath. schools gemeente	588	0.969	1.319	0	5
No. cath. schools 15km radius	588	3.370	2.984	0	11
Herfindahl gemeente	588	0.424	0.321	0.059	1

Competition and Central Exam Test Scores (OLS)

The estimation equation is

$$G_{ij} = \beta_0 + \beta_1 \cdot C_{ij} + \beta_2 \cdot x_i + \beta_3 \cdot z_j + \varepsilon_{ij}$$

where i denotes the individual school and j education markets, G_{ij} is the average centraal examen grade at school-level, C_{ij} is the level of competition faced by school i in market j , x_i are control variables at the school level and z_j are controls at the local geographic level.

Table 3 shows that **all competition coefficients have the expected sign**. The preferred competition measure (4) is highly significant. A **one standard deviation shift in the number of catholic competitors (4) shifts academic outcomes up by around 0.15 standard deviations**.

Table 4 displays coefficients on select school-level variables.

Table 3: Effects of Competition on Test Scores

	(1)	(2)	(3)	(4)
	Herfindahl Gemeente	Nearest Catholic school, km	Number of Catholic Schools within 15km	Number of Catholic Schools in Gemeente
	-1.197*** (0.434)	-0.010 (0.007)	0.075* (0.045)	0.277*** (0.114)
N	467	467	467	467
R ²	0.28	0.27	0.27	0.28

Table 4: Control Variables, Effects on Test Scores

Variable	sign	significance
Cultural minority students	negative	***
Above advice	negative	***
Ability tracked students (%)	positive	***
Class size (%)	positive	***

All estimations include: other school characteristics, postcode characteristics

Competition and Central Exam Test Scores (2SLS)

If new schools emerge in reaction to low test scores, one may observe high levels of competition in areas with low performing schools. Also, competition and test scores may both be driven by some unobserved variable in the error term.

The instruments employed are the number of catholics in the gemeente and the gemeente population. Being catholic should not influence academic achievement. The pure size of a community should not influence achievement once urbanicity is controlled for.

All instruments are not weak and pass standard overidentification tests. **2SLS coefficients are considerably larger than in OLS (Table 5)**.

Table 5: Effects of Competition on Test Scores (2SLS)

	(1)	(2)	(3)	(4)
	Herfindahl Gemeente	Nearest Catholic school, km	Number of Catholic Schools within 15km	Number of Catholic Schools in Gemeente
	-2.873*** (0.089)	-0.029* (0.016)	0.216* (0.112)	0.430*** (0.154)

Grade Inflation and Competition

The effects of competition on grade inflation are a priori unclear. Awarding higher grades may be an attempt at attracting students but schools may also attempt to build a reputation as "tough-grading".

Table 6 shows that the grade gap shrinks under competition (OLS/2SLS). That is, grade inflation is diminished by competition. Because results are insignificant for competition measures other than catholic schools in the gemeente, this cannot be interpreted as evidence for beneficial effects of competition, yet **there is no indication that competition increases grade inflation**.

Table 6: Effects of Competition on Grade Inflation (OLS/2SLS)

	(1)	(2)	(3)	(4)
	Number of Catholic Schools within 15km OLS	Number of Catholic Schools within 15km 2SLS	Number of Catholic Schools in Gemeente OLS	Number of Catholic Schools in Gemeente 2SLS
	-0.069 (0.0493)	-0.124 (0.1131)	-0.206* (0.114)	-0.273* (0.1626)

Does anyone lose? Quantile regression (QR) results

Schools at the lower end of the test score distribution may be hurt by school competition. Figure 1 shows that while there is little evidence that the effect is particularly high at the lower and upper end of the distribution, there is certainly **no evidence that any quantile suffers**.

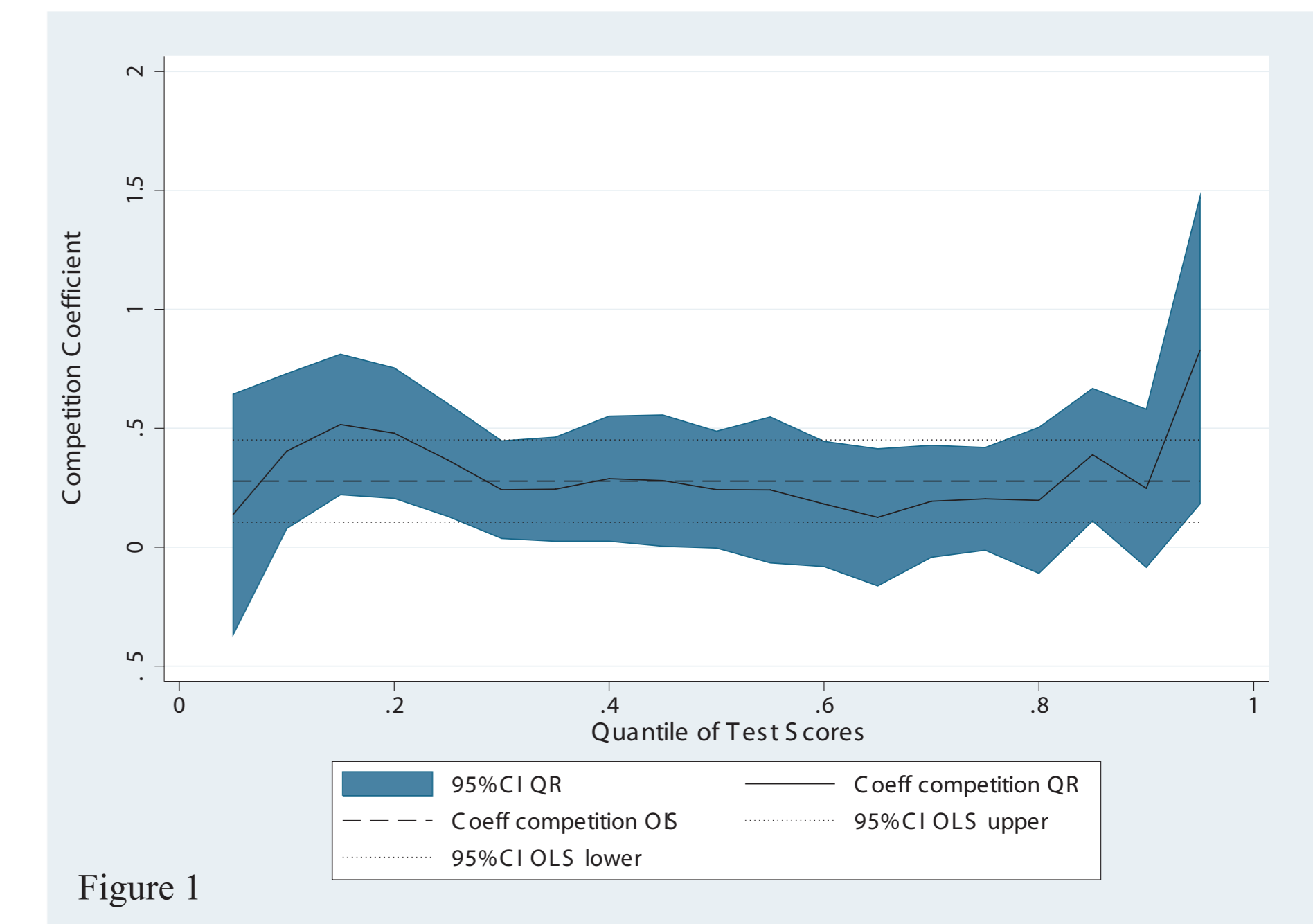


Figure 1

Instrumental Variable Quantile Regression

Employing the recently developed IVQR estimator by Chernozhukov and Hansen (2006) confirms the quantile regression results (see Figure 2). The **effect of competition is positive across the distribution of test scores**. As is the case in QR, the coefficients in the lower and upper range of the distribution significantly differ from those in the middle quantiles.

QR and IVQR results for grade inflation (not reported here) suggest that the **restraining effect of competition is largest for those schools at the upper end of the grade inflation distribution** (i.e. schools with high grade inflation).

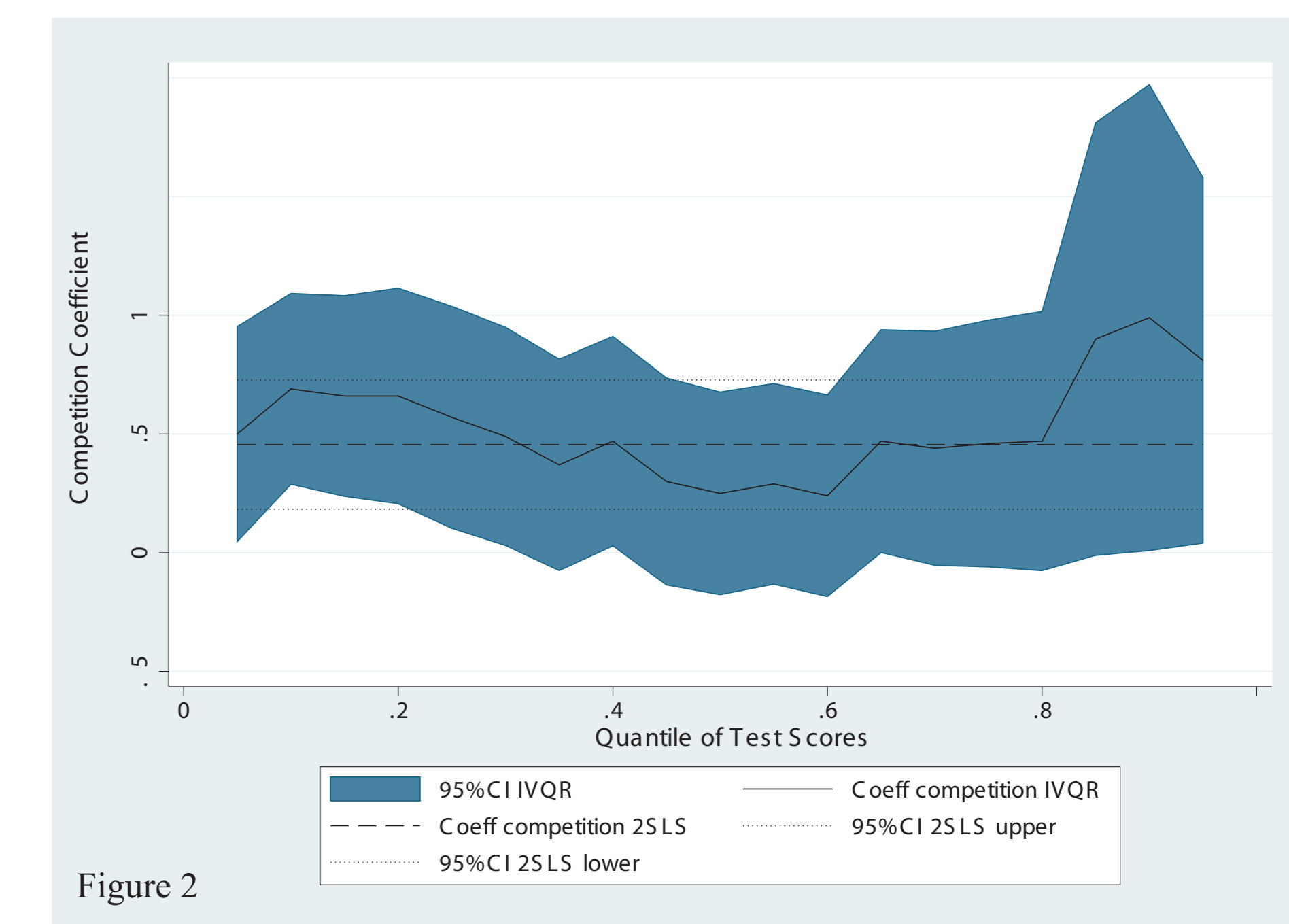


Figure 2

Conclusion

There are significant beneficial effects of catholic competition on central exam grades in non-public schools.

Competition does not precipitate grade inflation, there is some tentative evidence it might even reduce grade inflation.

While the effect on central exam grades does not differ much across the distribution, the effect on grade inflation is largest for those schools at the upper end of the distribution