



# The effect of the largest school closing on student achievement

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# Introduction

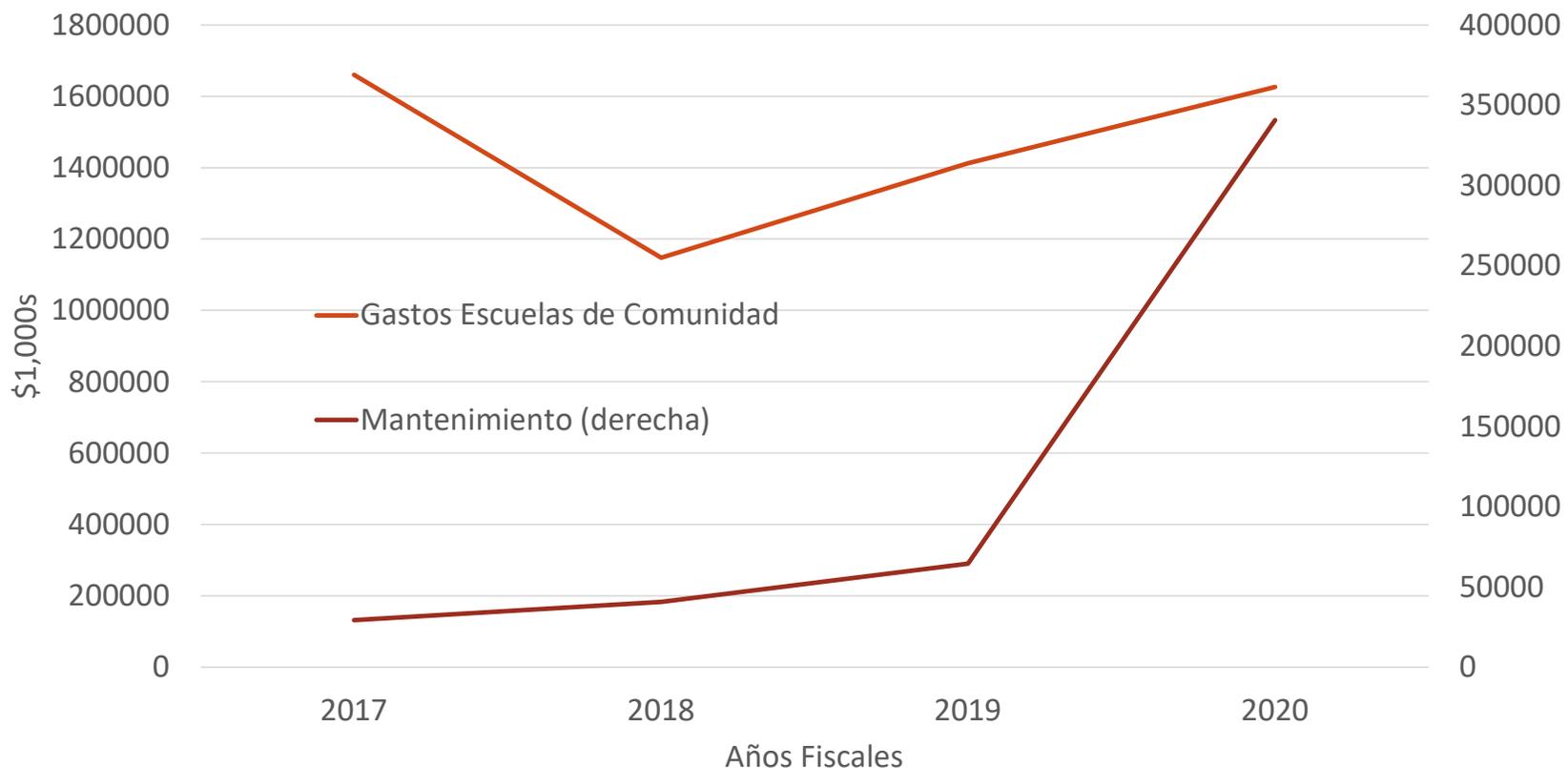
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- In the related literature there is some mixed evidence on the consequences that school closing has on student achievement, but many articles pointed to detrimental effects.
- De la Torre and Gwynne (2009): students in Chicago impacted after first year. 6% of the displaced students went to a school with higher educational achievements.
- Larsen (2014): 33 schools closed in Milwaukee; some students converged to their expected education levels while others did not.
- Rumberger y Larson (1998): closing represented a risk factor to successfully graduate
- Engberg et al. (2012) and Brummet (2012): displaced students were negatively affected, unless receiving school had a better academic quality.
- Kirshner et al. (2010): closing in Jefferson, Riverside exacerbated educational challenges of displaced students.

# The case of Puerto Rico

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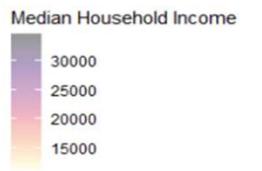
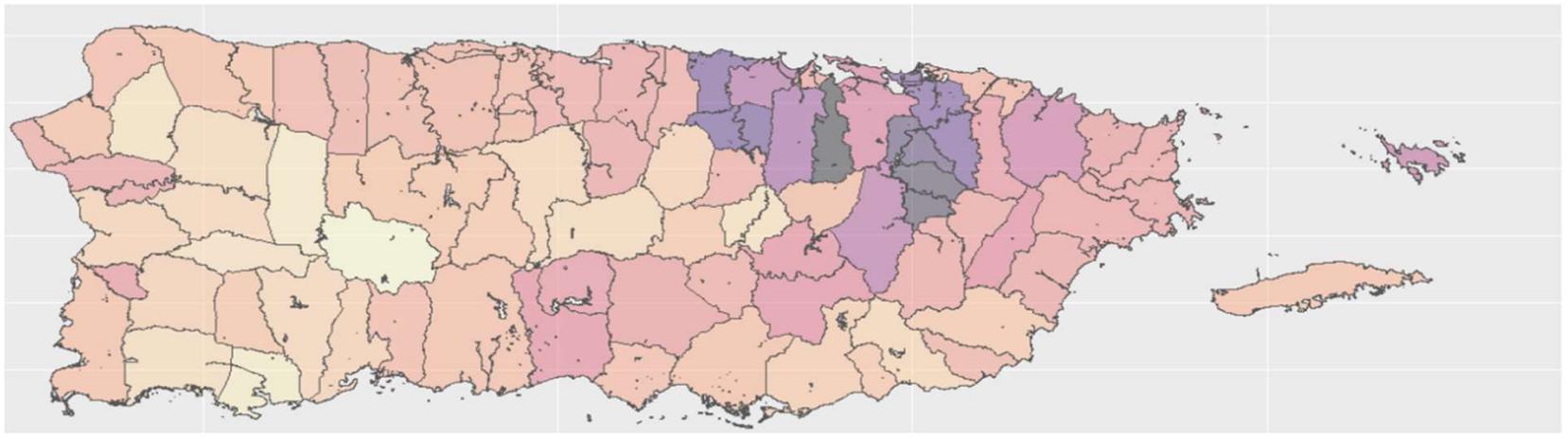
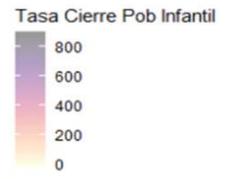
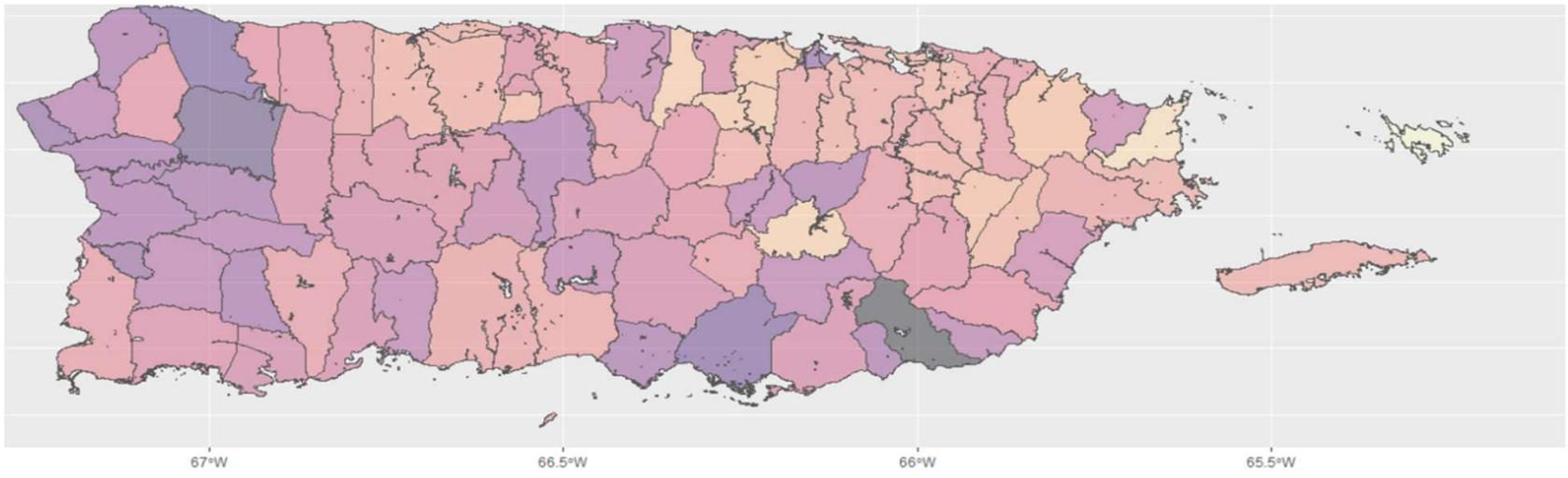
- 34% of the public schools in Puerto Rico were closed in three years (255 in 2018-2019 and 183 in 2017-2018)
- To our knowledge, it's the most intense school closing in the U.S. and in the world. Michigan closed 246 schools in 2006-09 and West Virginia 300 in 1990-2000.
- 58,606 students were displaced. 2,616 students went through more than one closing.
- Communities were not consulted as in Milwaukee and teachers were not selected based on the merit principle but on seniority.
- Fiscal Board (2018): "Tightening its system will give PRDE (Puerto Rico Departamento of Education) the flexibility and funding to focus on improving the quality of education provided"
- ABRE (2019): "'Las consolidaciones y cambios aparentan mejorar el perfil de estudiantes en muchas escuelas.'"



In fiscal years 2017 to 2020, local expenditures in the operation of schools declined by \$34.5 million (nominal figures), while items such as school maintenance increased by \$311.7 million in the same period, partly because of closed schools.

<b>Variables</b>	<b>Promedio</b>	<b>Desviación Estándar</b>	<b>Promedio Desplazados</b>	<b>Promedio No Desplazados</b>
<b>Edad</b>	11.43	1.34	11.2	11.5
<b>Proporción Desplazados</b>	0.25	0.43		
<b>Promedio en META 2019</b>	2.20	0.77	2.18	2.21
<b>Promedio en META 2018</b>	2.41	0.825	2.49	2.38
<b>Promedio en META 2017</b>	2.62	0.85	2.77	2.57
<b>Proporción de estudiantes 2019 con puntuación personal menor que su escuela del año pasado</b>			0.688	0.669
<b>Proporción de estudiantes 2019 con puntuación personal mayor que su escuela del año pasado</b>			0.312	0.331
<b>Proporción de Fémimas</b>	0.512	0.50	0.52	0.513
<b>Proporción puertorriqueños</b>	0.984	0.124	0.983	0.985
<b>Proporción de estudiantes con problemas específicos de aprendizaje</b>	0.166	0.37	0.176	0.163
<b>Número de miembros en la familia</b>	3.86	1.13	3.88	3.86
<b>Proporción de estudiantes en regiones educativas bajas</b>	0.26	0.44	0.24	0.27
<b>Proporción de pobres</b>	0.78	0.415	0.807	0.77

## Descriptive Statistics



# Methodology

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- dependent variable: negative annual change in the results of standardized tests taken by students in third, fourth, fifth, sixth, seventh, eighth, and eleventh grades in the “regular stream” of the public system.

- then, n is truncated to 77,204

- PSM:  $p(x) \equiv \Pr\{D = 1|X = x\} \forall x \in \tilde{X}$ , where  $Y_0 \perp D|p(X)$

where D is the treatment indicator (displaced or not) received by student i, X is a set of pretreatment characteristics (observable characteristics), and  $\tilde{X}$  is the untreated group.

- three sets with three different matching

- balancing properties were verified

# PSM, 2018 to 2019

Variable Dependiente:	Modelo 1 (average treatment effect on the treated): Logit	Modelo 2 (average treatment effect): Logit	Modelo 3 (average treatment effect on the treated): Probit
<b>Bajó puntuación en METAS</b>	Covariados: edad, sexo, por debajo niveles de pobreza, promedio de escuela actual es menor al promedio de escuela donde estuvo el año pasado	Covariados: edad, sexo, por debajo niveles de pobreza, promedio de escuela actual es menor al promedio de escuela donde estuvo el año pasado	Covariados: edad, sexo, por debajo niveles de pobreza, promedio de escuela actual es menor al promedio de escuela donde estuvo el año pasado
<b>Desplazados vs. No Desplazados</b>	0.0403*** (.0049)	0.035*** (.0025)	0.0404*** (.0049)
<b>n</b>	19,338	77,204	19,338

# PSM, 2018 to 2019

Variable Dependiente:	Modelo 1 (average treatment effect on the treated): Logit	Modelo 2 (average treatment effect): Logit	Modelo 3 (average treatment effect on the treated): Probit
<b>Bajó puntuación en METAS</b>	Covariados: edad, sexo, por debajo niveles de pobreza, promedio de escuela actual es mayor al promedio de escuela donde estuvo el año pasado	Covariados: edad, sexo, por debajo niveles de pobreza, promedio de escuela actual es mayor al promedio de escuela donde estuvo el año pasado	Covariados: edad, sexo, por debajo niveles de pobreza, promedio de escuela actual es mayor al promedio de escuela donde estuvo el año pasado
<b>Desplazados vs. No Desplazados</b>	0.038*** (.005)	0.037*** (.0025)	0.04*** (.0009)
<b>n</b>	19,338	77,204	19,338

# PSM, 2017 to 2019

Variable Dependiente:	Modelo 1 (average treatment effect on the treated): Logit	Modelo 2 (average treatment effect): Logit	Modelo 3 (average treatment effect on the treated): Probit
<b>Bajó puntuación en METAS</b>	Covariados: edad, sexo, por debajo niveles de pobreza, problemas específicos de aprendizaje, número de miembros en la familia, región educativa baja.	Covariados: edad, sexo, por debajo niveles de pobreza, problemas específicos de aprendizaje, número de miembros en la familia, región educativa baja.	Covariados: edad, sexo, por debajo niveles de pobreza, problemas específicos de aprendizaje, número de miembros en la familia, región educativa baja.
<b>Desplazados vs. No Desplazados</b>	0.062*** (.007)	0.065*** (.0024)	0.055*** (.007)
<b>n</b>	8,929	8,929	8,929

# Policy Recommendations

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- reopen some schools to allow smaller size groups. Merit should be criteria to hire personnel, not seniority.
- Create a committee that evaluates petition to reopen schools based on several characteristics, including strength of facilities.
- Reopening would give resilience capacity to the DE when pandemic and natural events attacked.
- new condition for other welfare benefits: parents should look for grades and attend school meetings. (Attendance is required for participation in local Medicaid).
- require teachers to include grades in standard tests as part of gradebook.
- choice of school director should be in coordination with school communities (e.g. self-nominations are evaluated by school communities, who eventually present a list of candidates to the DE).