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Research Article

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Abstract

We analyzed the effect of competition and the Preferential School Subsidies (SEP) Law on the quality of Chilean schools for the period 2000-2013. We use dynamic panel regressions, and we show that competition has a positive and non-linear effect on education quality. The initial positive effect of competition on education quality is not persistent and is reversed for high levels of competition. The impact of competition on education quality also depends on the administrative dependence of schools. The SEP Law increased education quality, but through competition the inequality between public and private schools deepened. These results are relevant for the design of public policies aimed at reducing inequality in Chilean education.

Resumen

Analizamos el efecto de la competencia y la Subvención Escolar Preferencial (SEP) sobre la calidad de las escuelas chilenas para el período 2000-2013. Utilizamos modelos de panel dinámicos y mostramos que la competencia tiene un efecto positivo y no lineal en la calidad de la educación. El efecto positivo inicial de la competencia sobre la calidad de la educación no es persistente y se revierte en los altos niveles de competencia. El impacto de la competencia en la calidad de la educación también depende de la dependencia administrativa de las escuelas. La Ley SEP aumentó la calidad de la educación, pero a través de la competencia profundizó la desigualdad entre escuelas públicas y privadas. Estos resultados son relevantes para el diseño de políticas públicas orientadas a reducir la desigualdad en la educación chilena.

1. Introduction

Education quality has been widely discussed due to its effects on labor productivity, long-term economic growth and the welfare of society. Several studies have analyzed the factors that determine education quality to analyze the key aspects for the design of educational policies and redistributive mechanisms to reduce social inequality. International studies from both developed and emerging countries have highlighted two relevant factors for education quality: competition and state subsidy. Empirical evidence has shown that the quality of primary and secondary education is better when there is increased competition (Belfield and Levin, 2002; Greene and Kang, 2004) and state subsidy (Shih, 2012). A significant part of these studies highlights that the better academic performance of private schools contrasts with the low performance of public schools. This would be a relevant factor that accentuates the social gap within a country (Muralidharan and Kremer, 2006; Shih, 2012). These determinants have been fundamental pillars for the design of public education policies at the national level.

The primary and secondary education system in Chile has experienced a similar evolution. Although its origins date back to 1967, it was from 1988 that the education quality or the academic performance of schools began to be measured through the National System for Measuring the Quality of Education (Sistema de Medición de la Calidad de la Educación, SIMCE). SIMCE is a centralized system of tests whose objective is to evaluate the learning and knowledge of the students on subjects contained in the school curriculum, applied to primary and secondary education. According to SIMCE scores, a ranking of schools is established (Abdul-Hamid, 2017).

The results obtained in SIMCE have given rise to various empirical studies that have confirmed the effects of competition and inequality between public and private schools (Gallego, 2002; Auguste and Valenzuela, 2004; Urquiola, 2016). However, regarding the impact of competition on education quality, there are still aspects to be investigated. Although several studies focused on Chile highlight the positive effect of the competition on SIMCE results, its impact could trigger an adverse selection mechanism in student enrollment that, in turn, reduces the performance of schools. This fact reveals that competition establishes a trade-off between the incentive and the adverse selection of students that is relevant for the design of public policies. On the other hand, the Chilean State has implemented a series of subsidies to support public schools and improve the performance of socioeconomically vulnerable students. One of these is the Preferential School Subsidy (Subvención Escolar Preferencial, SEP) law, which unlike various subsidies granted to schools, it is a voucher subsidy system aimed at socioeconomically vulnerable students. Since 2008 it has been applied to preschool and primary education and since 2014 it has also been incorporated into secondary education. The objective of the SEP law is to encourage the different schools to receive students who have been subsidized by it. Although some studies have partially demonstrated the effectiveness of the SEP law on school performance (Valenzuela, Villarroel and Villalobos, 2013), its implementation has also left some questions open. If schools compete for students who benefit from the SEP law, then its implementation could

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condition the competitive behavior of schools and its impact on school performance, affecting the effectiveness of this public policy.

In accordance with the previous argument, this article analyzed the effect of competition and the SEP law on the education quality in Chile, from a broader perspective than existing studies. This work contributes to the empirical literature and to the design of public policies for Chile and other economies in two aspects. First, we analyzed the possible non-linear effect of competition on education quality. Although many studies support the positive effect of competition on school performance, others conclude that this impact would turn negative if schools were to resort to increased enrollment. This fact would explain the trade-off between the incentive to achieve higher enrollment and the adverse selection problem associated with it. So, we verified if the positive impact of competition was marginally persistent or decreased when there was a higher level of competition between schools. Second, we analyzed the effect of the SEP law and how this subsidy conditioned the impact of competition on the educational quality of the schools of the same administrative dependence.

We used data from the SIMCE scores of the primary levels of Chilean schools for the period 2000-2013. Our results support that competition has a positive and non-linear effect on education quality. That is, the impact of competition is not persistent and is reversed for higher levels of competition. Competition between public schools had a negative effect on education quality, but had a positive impact when it is between private schools or subsidized private schools. On the other hand, the implementation of the SEP law increased education quality, but through competition inequality between public and private schools deepened. These results are relevant for policy makers, because they empirically support that public education policy aimed at promoting competition does not have permanent effects on the quality of education, and that these effects depend on the administrative dependence of the school. In addition, these novel findings are useful for policy makers because they guide the improvement of the SEP law to deepen its positive impact on education quality.

This article is structured as follows. After this introduction, section 2 presents the literature on the effects of competition and subsidies on education quality. This section also presents the research hypothesis. Section 3 describes the data and methodologies used. Section 4 describes the main results of this study and section 5 summarizes the conclusions.

2. Theoretical framework and hypothesis

2.1. Effects of competition on education quality

Various studies have mentioned that education quality is a crucial factor in parents' decision regarding which school to send their children to (Gallego, 2002; Gómez, Chumacero and Paredes, 2012).

Although evidence has documented the difficulty of measuring competition in the education sector, most studies have concluded that a higher degree of competition increases educational quality in both developed and emerging countries (Epple and Romano, 1998; Belfield and Levin, 2002; Greene and Kang, 2004). This positive relationship between competition and education quality is due to the incentive effect associated with student enrollment. Greater competition translates into the pursuit of higher school enrollment or the ability for schools to select students who best reflect their educational curriculum. Chile has not been exempt from these trends. Gallego (2002) analyzed a sample of almost 5000 schools for the 1994-1997 period. His results proved that competition significantly increases

education quality, as measured by SIMCE scores. Auguste and Valenzuela (2004) and Gómez et al. (2012) ratified the positive impact of competition and added that the purpose of competition is to attract students with higher academic performance. Other studies support these results and indicate that competition is a relevant factor to explain education quality in Chile (Sapelli and Torche, 2002; Sapelli, 2003; Román and Perticará, 2012; Chumacero, Gallegos and Paredes, 2016).

Other research suggests that there is a significant and negative relationship between competition and education quality (Borland and Howsen, 1996). Marlow (2000) studied the performance of schools in the state of California and demonstrated that competition has a negative effect on education quality. Dijkgraaf, Gradus and De Jong (2013) found similar evidence regarding schools in the Netherlands. These studies warn that the competition generates an adverse selection problem in selected students, causing a reduction in school performance. In Chile, there are some studies in this regard. Hsieh and Urquiola (2003) support these findings. Even Auguste and Valenzuela (2004) indicate that the impact of competition on education quality is marginally lower for Chilean schools. This fact could occur due to higher levels of competition or lower incentives to achieve high academic performance. Therefore, the existence of a trade-off between the incentive effect (positive impact of competition on education quality) and the adverse selection problem (negative impact) would imply a possible non-linear relationship between competition and education quality. The novelty of this article is to combine more than one reason that could explain the impact of competition on the quality of Chilean education, analyzing this trade-off in a more complete way. This leads us to formulate the first hypothesis:

H1: Competition in the primary education sector has a non-linear effect on education quality.

In general, the previous results are transversal to the different types of schools, that is, public or private. However, discussing the performance of these schools is equivalent to entering into a comparison in which the low performance of the public school is progressively decoupled from the higher performance of private schools. This fact has been widely documented by various international studies. Friedman (1997) recognized the progressive decline of education quality in the United States public schools. This fact was later confirmed by Sander (1999), who in an empirical study applied to schools in the state of Illinois, found notable differences between the educational quality of public and private schools. The author also added that school performances were independent of each other and the poor performance of public schools was associated with socioeconomically vulnerable students. Other international studies confirm this decoupling of results between public and private schools (Muralidharan and Kremer, 2006; Shih, 2012).

In Chile, there is similar evidence (Gallego, 2002; Sapelli and Torche, 2002; Sapelli and Vial, 2002; Sapelli, 2003; Redondo, Descouvieres and Rojas, 2005; Chumacero et al., 2016). However, the social implications of these results have highlighted this debate. Auguste and Valenzuela (2004) point out that the administrative dependence of public schools is tied to municipalities and this fact exacerbates not only the differences in results when compared to private schools, but also social inequality. Even the inequality among municipalities would extend to public schools. These differences have been explained mainly by the amount of economic resources and the quality of public management that each municipality has. Thus, during the last two decades there has been a massive exodus of students moving from the public sector to the subsidized private sector (Mizala and Romaguera, 2001). The poor quality of the public sector and the better performance of subsidized private schools would encourage this decision (Gómez et al., 2012). Cuesta, González and Larroulet (2020) warn that low-performing students are underrepresented on test day, which generates a distortion in the quality of

the school that affects the parents' choice. Parents even face change costs that also influence school choice (Gallegos, Chumacero and Paredes, 2017). Román and Perticará (2012) suggest that this gap in educational and social quality means that the most socioeconomically vulnerable students remain in lower-quality schools. Of those who transfer to other schools, nearly a third end up in lower performing schools, accentuating the gap between public and private schools.

The above arguments support that competition could have a different impact on education quality in public and non-public schools. Friedman and Friedman (1981) and Sander (1999) empirically demonstrated that in the United States a higher degree of competition in the private education sector increases education quality. Their results suggest that the possibility of selecting students is associated with a higher socioeconomic level and facilitates the development of higher quality educational curricula. However, Greene and Kang (2004) add that public schools face an adverse effect on education quality due to competition. In Chile, the empirical discussion has implicitly provided a similar conclusion. Gallego (2002) points out that competition between private and subsidized private schools is associated with higher SIMCE scores. The author argues that this result is explained by the incentives these schools have to attract high-performance students. On the other hand, Hsieh and Urquiola (2003) analyzed 150 public schools between 1982 and 1996 and concluded that the lower academic performance of public schools is linked to greater competition between them. Redondo et al. (2005) add that although public schools receive public funds to alleviate low school performance, this is not enough to correct the gap between them and private schools. These studies have analyzed public and non-public schools separately, and not together. Considering this point of view would allow the design and evaluation of public education policy in Chile to be based on the competitive behavior of schools with different administrative dependencies. In this way, its effects on the quality of schools would be quantified and an empirical parameter would be established for the allocation of public resources. Therefore, we formulate the following hypothesis:

H2: Competition in the private (public) education sector has a positive (negative) effect on education quality.

2.2. Effect of subsidies on education quality

Most international empirical studies have concluded that state subsidies for public and private education have relevant effects on education quality. Shih (2012) points out that state subsidies awarded to schools are associated with higher school performance and generate a redistributive socioeconomic effect (López-Torres, Prior and Santín, 2019).

The education subsidy policy in Chile was originally and transversally designed to benefit students without considering existing socioeconomic differences. However, this policy did not consider that socioeconomically vulnerable students would face a more complex and costly learning process (Reschovsky and Imazeki, 2001). Many schools implemented a selection process that allowed them to select students with higher learning potential and higher socioeconomic status. This policy segregated the poorest students and increased the quality gap between public and private schools (Hsieh and Urquiola, 2003; Elacqua, 2012). For these reasons, González, Mizala and Romaguera (2002) suggested that if school performance on the SIMCE tests is positively related to socioeconomic level, the State should subsidize students with limited resources to reduce the gap in school performance according to socioeconomic conditions. Gallego (2002) added that this type of subsidy policy must be tied to a higher school performance on behalf of the students. In fact, Larrañaga and Peirano (2006) argued that this type of subsidy would have an important redistributive effect on students with lower

socioeconomic level and school performance. However, they cautioned that the effectiveness of these subsidies depends on how schools use additional resources.

In accordance with the previous arguments, the SEP law was established as a way to rectify the original design of the educational subsidy policy (since 2008 for preschool and primary education, and since 2014 for secondary education). Under the SEP law, the state grants resources to socioeconomically vulnerable students. Public and subsidized private schools that receive these resources adhere to this policy and must meet academic and administrative objectives related to the use of the resources. Since then, various studies have attempted to quantify the direct effect of the SEP law on education quality. Studies such as that of Valenzuela et al. (2013) and Correa, Parro and Reyes (2014) corroborate the positive effect on the school performance of socioeconomically vulnerable students. However, the analysis of these studies ignores long-term changes in school performance and school heterogeneity as soon as they adhere to the SEP policy. More recently, Mizala and Torche (2013), using panel data and correcting for the heterogeneity of adherence to the SEP policy, showed that this subsidy had a positive and persistent effect on education quality, mainly in public schools. More recently, Mizala and Torche (2017) showed that the SEP law had long-term effects, although schools were slow to adjust the benefits of this public policy. In general, empirical evidence has corroborated that the direct effect of the SEP law increases the education quality in public schools. However, the effect in subsidized private schools is not yet clear. This fact is relevant for the evaluation of this policy. Therefore, we formulate the following hypothesis:

H3: The SEP law has a positive effect on education quality.

Subsidies granted to students such as the SEP could also have an indirect channel through which education quality would be affected, mainly through competition. Sahin (2004) points out that these types of subsidies have a relatively favorable effect on school performance because the student has the possibility of taking their voucher to a higher quality school. He adds that in these cases the subsidy has a positive influence on the enrollment of the receiving schools due to a competitive reaction among them. In Chile, this potential indirect channel has not been investigated and two facts mark the interest in studying this effect and its implications for educational public policy. First, the majority of students who benefit from the SEP law belong to public schools. Sapelli and Torche (2002) add that in public schools, the effectiveness of subsidies per student (such as the SEP law) could be hampered by subsidies granted to the school. Thus, if students migrate to other higher quality educational establishments such as subsidized private schools, these subsidies would act as a tax that would deprive students of these benefits just because they changed schools. Román and Perticará (2012) add that these events give students almost no incentive to leave the public school system, thus increasing segregation. Second, subsidized private schools may decide not to adhere to this subsidy. In this context, Hsieh and Urquiola (2003) and Redondo et al. (2005) warn that vulnerable students have characteristics that make them less eligible for subsidized private schools. This fact reduces the incentive for students to switch to these schools and remain in the public system. For these reasons, Feigenberg, Yan and Rivkin (2019) question the effectiveness of the SEP law, because it has failed to close the educational gap, which could affect the relationship between education quality and competition. These facts may imply that public schools compete for low-income, low-achieving students, making them captive to the public school system. On the other hand, private schools and subsidized private schools could compete for students with a higher academic potential. Therefore, we have formulated this hypothesis:

H4: Since the SEP law, competition between public schools (non-public) has a negative (positive) effect on education quality.

3. Data and methods

3.1. Sample data

The data used in this research corresponded to the primary levels of the educational system and were extracted from the SIMCE tests, developed by the Ministry of Education of Chile. The data includes the SIMCE scores and the main characteristics of the primary level schools during the 2000-2013 period, and was structured as unbalanced panel data. Schools that closed were removed from the database. Table 1 shows the variables.

The dependent variable of this research was the education quality (EQ), which was measured as the simple average of the SIMCE mathematics and language scores. This measurement was suggested by different empirical works developed for Chilean schools and represents the official measure to quantify the progress of educational quality (Gallego 2002; Sapelli and Torche, 2002).

The control variables include the administrative dependence of schools (DEP), measured by three different dummy variables: private school (PRIV), subsidized private school (PSUB) and public school (PUB). Several authors have used these measurements to reflect the quality disparity based on the administrative nature of schools (Sapelli and Torche, 2002; Sapelli and Vial, 2002; Chumacero et al., 2016). We also included a COMP variable that measured competition to quantify the effect of the education market structure on the quality of schools (Gallego, 2002; Belfield and Levin, 2002; Greene and Kang, 2004; Urquiola, 2016).

The analysis also considered other control variables recommended in the literature, such as socioeconomic level (Donoso and Hawes, 2002), urban location (Gallego, 2002) and size of establishments (Greene and Kang, 2004).

Table 1. Variables.

Variable		Definition
Education quality variables		
EQ	Education Quality	Average SIMCE score of the mathematics and language test.
LANG	Language score	SIMCE language score.
ULANG	Language score increases	Dummy 1 if the school significantly increased its SIMCE language score in relation to the previous measurement and 0 otherwise.
RLENG	Language score remains	Dummy 1 if the school maintained its SIMCE language score in relation to the previous measurement and 0 otherwise.
DLANG	Language score decreases	Dummy 1 if the school significantly decreased its SIMCE language score in relation to the previous measurement and 0 otherwise.
MAT	Mathematics score	SIMCE mathematics score.
UMAT	Mathematics score increases	Dummy 1 if the school significantly increased its SIMCE mathematics score in relation to the previous measurement and 0 otherwise.
RMAT	Mathematics score remains	Dummy 1 if the school maintained its SIMCE mathematics score in relation to the previous measurement and 0 otherwise.
DMAT	Mathematics score decreases	Dummy 1 if the school significantly decreased its SIMCE mathematics score in relation to the previous measurement and 0 otherwise.
Dependence of the schools (DEP)		
PRIV	Private schools	Dummy 1 if the school has private dependence and 0 otherwise.
PSUB	Subsidized private schools	Dummy 1 if the school has subsidized private dependence and 0 otherwise.
PUB	Public schools	Dummy 1 if the school has municipal dependence and 0 otherwise.
Other control variables		
URB	Urban	Dummy 1 if the school is located in urban zone and 0 otherwise.
SOC	Socioeconomic level	Socioeconomic level of the schools that range between 1 (low level) and 5 (high level)
SIZE	Students	Natural logarithm of the number of students of the school who took the SIMCE test.
COMP	Competition	The school's student enrollment in relation to the district's total enrollment.

Source: Authors' elaboration.

3.2. Econometric methodology

To analyze the specific role of competition and the impact of the SEP law on the educational quality of Chilean schools, we estimated this model:

$$EQ_{it} = \beta_0 + \beta_1 EQ_{it-1} + \beta_2 SEP_{it-1} + \beta_3 COMP_{it} + \beta_4 COMP_{it}^2 + \sum_{m}^{M} \beta_m X_{mit} + \eta_i + \eta_t + \varepsilon_{it} \quad (1)$$

Where EQ_{it} is the education quality measured by the simple average between the language and mathematics SIMCE scores of the school i in the period t. The variable SEP_{it-1} is a dummy variable that takes the value 1 if the school i adheres to the SEP law in t-1 period and 0 otherwise. Mizala and Torche (2013) suggest this measure to quantify the impact of school adherence to this voucher policy and not its absorbing effect on the SIMCE score in t. The variable $COMP_{it}$ is the measurement of competition of the school i for period t, while $COMP^2_{it}$ measures the non-linear effect of competition on education quality. We also included m control variables within the X_{mit} matrix, such as the administrative

dependence of the schools (DEP_{it}), the size of the schools ($SIZE_{it}$), the socioeconomic level (SOC_{it}) and the urban zone dummy variable URB_i.

Next, to analyze the specific effect of competition on education quality according to the administrative dependence of the schools, we estimated this dynamic model:

$$EQ_{it} = \beta_0 + \beta_1 EQ_{it-1} + \beta_2 SEP_{it-1} + \beta_3 COMP_{it} + \beta_4 DEP_{it} + \beta_5 \left(COMP_{it} \times DEP_{it}\right) + \sum_m^M \beta_m X_{mit} + \eta_i + \eta_t + \varepsilon_{it} \quad (2)$$

Where EQ_{it} is the education quality measured by the simple average between the language and mathematics SIMCE scores of the school i in the period t. The interactive variable ($COMP_{it} \times DEP_{it}$) shows the impact of competition according to the administrative dependence of the school i. The other control variables have the same definition described in the model (1).

Finally, to analyze the effect of competition on school quality since the SEP law application and according to the administrative dependence, we used this regression:

$$EQ_{it} = \beta_0 + \beta_1 EQ_{it-1} + \beta_2 SEP^* + \beta_3 COMP_{it} + \beta_4 DEP_{it} + \beta_5 \left(SEP^* \times COMP_{it} \times DEP_{it}\right) + \sum_m^M \beta_m X_{mit} + \eta_i + \eta_t + \varepsilon_{it} \quad (3)$$

Where EQ_{it} is the education quality measured by the simple average between the language and mathematics SIMCE scores of the school i in period t. The variable SEP* adopts the value 1 since the year that the SEP law was applied (2008 for primary schools) and 0 otherwise. Therefore, SEP* measures the systematic effect of the SEP law on education quality and not the effect of the school's decision to adhere to the SEP law. Thus, the interactive variable ($SEP^* \times COMP_{it} \times DEP_{it}$) measures the impact of competition since the SEP law application according to the administrative dependence of the school i. The other control variables have the same definition described in models (1) and (2).

Models (1), (2) and (3) include individual fixed-effects η_i associated to school i and temporal effects η_t associated with year t. These models also include dummy variables by region and academic level to control for unobservable heterogeneity in education quality. All these models were estimated using the GMM method for dynamic panel data regressions proposed by Arellano and Bond (1991). We used a dynamic model to include the temporal inertia of school performance through the EQ_{it-1} regressor. The EQ_{it-1} regressor was treated as an endogenous variable because it correlates with the residuals. To correct the endogeneity problem, we used the lag in t-2 and t-3 as instruments. We tested the presence of first-order autocorrelation and the absence of higher-order autocorrelation to guarantee the consistency of the GMM estimators. We also used the Sargan test to evaluate the instrumental overidentification of the models and applied robust variance to control for the heteroskedasticity patterns.

4. Empirical results

4.1. Descriptive analysis

Table 2 shows the descriptive statistics and the cross-correlation between the variables and the education quality. The average quality of education was 248.96 points, with 251.67 and 246.51 points in the language and mathematics SIMCE tests, respectively. According to the descriptive results, it stood out that 40.92% and 36.18% of the schools maintained their scores in the respective SIMCE tests of language and mathematics; and they did not experience a significant variation compared to the previous measurement. Likewise, between 14.68% and 12.96% of the schools experienced significant

increase in their SIMCE language and mathematics scores in relation to the previous measurement. However, similar figures showed declines in both SIMCE tests.

Table 2. Descriptive statistics and correlations.

Variable	Mean	S.D.	Min.	Max.	Correlation
Education quality variables					
Quality (points)	248.96	28.06	116.0	365.0	1.00
Language (points)	251.67	27.82	116.0	362.0	0.96***
Language score increases (%)	14.68	35.39	0	1	0.18***
Language score remains (%)	40.92	49.16	0	1	0.09***
Language score decreases (%)	13.99	34.69	0	1	-0.19***
Mathematics (points)	246.51	30.65	115	392	0.97***
Mathematics score increases (%)	12.96	33.58	0	1	0.21***
Mathematics score remains (%)	36.18	48.05	0	1	0.05***
Mathematics score decreases (%)	12.17	32.69	0	1	-0.13***
Administrative dependence of the schools					
Private school (%)	6.07	23.89	0	1	0.40***
Private school quality (points)	290.43	25.18	148.5	352.0	
Subsidized private school (%)	39.19	48.81	0	1	0.14***
Subsidized private school quality (points)	253.47	26.87	138.0	351.0	
Public school (%)	54.71	49.77	0	1	-0.34***
Public school quality (points)	239.79	23.06	116.0	365.0	
Other control variables					
Urban (%)	61.51	48.65	0	1	0.22***
Socioeconomic (scale)	2.32	1.18	1	5	0.60***
Private school	4.87	0.33	3	5	
Subsidized private school	2.70	1.07	1	5	
Public school	1.76	0.72	1	5	
Students	33.26	34.55	0	740	0.19***
Competition (%)	4.87	8.90	0	1	0.06***

Notes: Superscripts ***, ** and * indicate significance at 1%, 5% and 10%, respectively. Source: Authors' elaboration.

Regarding the administrative dependence of schools, 54.71% corresponded to public schools (municipal schools), 39.19% to subsidized private schools and 6.07% to private schools. Public schools had the lowest performance, with an average score of 239.79 points when considering the SIMCE language and mathematics tests. This score rose to 253.47 and 290.43 in subsidized private schools and private schools, respectively. This fact reveals that the average SIMCE score of public schools is 29 points below that of subsidized private and private schools. Therefore, the fact that schools are public is negatively correlated with education quality, whereas this correlation changes to positive for non-public schools.

Regarding the location and socioeconomic level, 61.51% of the schools were located in urban areas, while the average socioeconomic level of Chilean schools was 2.32, which indicates a medium-low socioeconomic level. However, we observed a relevant heterogeneity in the socioeconomic level of the schools according to their administrative dependence. Private schools were characterized by

high socioeconomic level (4.87), while subsidized private (2.70) and public (1.76) schools had lower socioeconomic records. This would also be related to lower school performance. The fact that there was a positive and significant correlation between socioeconomic level and the education quality in Chile stands out. Therefore, schools located in urban areas and with higher socioeconomic levels achieve higher SIMCE scores. This preliminary result reveals the uneven performance of Chilean schools according to their location and socioeconomic level.

Likewise, on average about 33 students per establishment took the SIMCE test. This would indicate that the size of the school correlates with higher performance in the SIMCE test, which reinforces the idea that schools compete for a higher level of enrollment. In fact, schools averaged 4.87% of the district's enrollment, a figure that was positively and significantly correlated with education quality.

4.2. Effect of competition and SEP law on education quality

Table 3 shows a comparative analysis of the performance and administrative dependence of schools before and after the introduction of the SEP law in the Chilean educational system. Since the application of the SEP law, public schools increased their average SIMCE score by 5.55 points. This result is led by the scores in the language test (7.04 points) and to a lesser extent in the mathematics test (3.79 points). The SIMCE scores reveal two relevant facts. First, once the SEP law was enforced, there was a reduction in the proportion of public schools that experienced significant decreases in SIMCE scores. Regarding the language test, the reduction went from 14.57% to 13.32%, while for the mathematics test, it went from 16.74% to 9.97%. This effect of the SEP law was observed to a greater extent in the mathematics test, where the scores were lower and the incremental effect of the SEP law was smaller. Second, the percentage of public schools that increased or maintained their SIMCE score also experienced a relevant decrease. The results would support the idea that the effects of the SEP law are not permanent. Once public schools are able to improve their school performance through the SIMCE exam, it is difficult to repeat this progress. Subsidized private schools also significantly increased their school performance by 3.77 points, although private schools (those that do not adhere to this policy) did not show significant changes in their school performance. Overall, the proportion of schools that decreased their SIMCE performance also decreased since the implementation of the SEP law.

Table 3. t-test for differences of means before and after the SEP law.

Variable	Before SEP Law	After SEP law	Difference	t-statistics
Schools (%)				
Private schools	7.49	5.63	1.86	11.32***
Subsidized private schools	35.63	40.32	-4.69	-15.17***
Public schools	56.88	54.05	2.83	8.85***
Quality (points)	245.76	250.01	-4.25	-21.62***
Private schools	290.58	290.38	0.20	0.32
Subsidized private schools	250.54	254.31	-3.77	-12.09***
Public schools	235.68	241.23	-5.55	-27.11***
Language (points)	247.83	252.91	-5.08	-26.16***
Private schools	290.26	288.72	1.54	2.50**
Subsidized private schools	252.98	256.94	-3.96	-12.85***
Public schools	237.86	244.90	-7.04	-33.68***
Language score increases (%)	15.31	14.48	0.83	3.62***
Private schools	9.62	16.06	-6.44	-8.30***
Subsidized private schools	14.81	16.22	-1.41	-3.73***
Public schools	16.38	13.01	3.37	10.85***
Language score remains (%)	46.50	39.16	7.34	23.01***
Private schools	56.55	53.91	2.64	2.17**
Subsidized private schools	47.65	44.35	3.30	6.23***
Public schools	44.44	33.76	10.68	25.39***
Language score decreases (%)	14.59	13.80	0.79	3.50***
Private schools	14.14	12.00	2.14	2.56**
Subsidized private schools	14.72	14.69	0.03	0.08
Public schools	14.57	13.32	1.25	4.17***
Mathematics (points)	243.73	247.59	-3.86	-17.90***
Private schools	290.89	294.67	-3.78	-5.42***
Subsidized private schools	248.19	252.33	-4.14	-12.23***
Public schools	233.52	237.31	-3.79	-16.72***
Mathematics score increases (%)	15.68	12.10	3.58	15.72***
Private schools	14.90	11.60	3.30	3.90***
Subsidized private schools	15.95	13.46	2.49	6.51***
Public schools	15.63	11.14	4.49	14.89***
Mathematics score remains (%)	44.51	33.56	10.95	34.71***
Private schools	51.86	45.52	6.34	5.20***
Subsidized private schools	45.35	37.22	8.13	15.48***
Public schools	43.00	29.57	13.43	32.25***
Mathematics score decreases (%)	16.20	10.89	5.31	23.25***
Private schools	13.85	12.18	1.67	2.01**
Subsidized private schools	15.84	11.95	3.89	10.29***
Public schools	16.74	9.97	6.77	22.16***
Students (number)	39.09	31.72	7.37	28.19***
Private schools	39.76	41.45	-1.69	-1.85*
Subsidized private schools	45.00	39.69	5.31	11.52***
Public schools	35.24	24.76	10.48	31.85***
Competition (%)	5.09	4.81	0.28	4.37***
Private schools	2.07	2.52	-0.45	-6.26***
Subsidized private schools	3.59	3.97	-0.38	-6.34***
Public schools	6.40	5.68	0.72	7.06***

Notes: Superscripts ***, ** and * indicate significance at 1%, 5% and 10%, respectively. Source: Authors' elaboration.

Since the application of the SEP law, a significant reduction in public school enrollment has been observed. Previous studies have indicated that the number of students enrolled in public schools have decreased in Chile since the late 1990s (Paredes and Pinto, 2009). This fact was due to the migration of students from public schools to subsidized private schools, in search of a school with better plans and performance. According to the t-test for the difference of means, since the implementation of the SEP law, the enrollment of public schools decreased on average from 35.24 to 24.76 students per grade. Therefore, the result described is a reflection that the SEP law cannot contain the migration of students from public schools. This result is also consistent with the significant increase in subsidized private schools (from 35.63% to 40.32% of the schools), and reveals that the migration of high achieving students to subsidized private schools has sustained the performance of these schools and decreased the performance of public schools.

Even the competition among public schools indicates a reduction in enrollment as a percentage of the district's total enrollment from 6.40% to 5.68% since the implementation of the SEP law. This ratio has increased for private and subsidized private schools. These results are in agreement with Sapelli and Torche (2002), who argue that subsidies directed at certain students make schools compete for these students and the resources they represent. It is even observed that public schools have higher rates of competition for enrollment, and that this may be related to an adverse selection problem in students and lower school performance.

Table 4 shows the results of model (1) and model (2). According to Arellano and Bond (1991), the GMM estimators are consistent because the AR1 test indicates the presence of first-order autocorrelation, while the AR2 test supports this absence in the second-order autocorrelation. The Hansen test shows that the models are overidentified and the instruments are valid and exogenous. The control variables had the expected results according to the empirical evidence. The socioeconomic level (SOC) had a positive and significant effect on education quality, while the urban location of the school (URB) also had a positive effect (Gallego, 2002). These results show the inequality of school performance among students from urban and rural sectors, as well as the disparity generated by their socioeconomic level. Finally, the size of the school (SIZE) had a positive and significant effect on education quality.

The administrative dependence of schools is also a relevant factor in school performance. The dummy variable for private schools (PRIV) had a positive and significant impact on school performance. Furthermore, the dummy variable associated with subsidized private schools (PSUB) also had a positive and significant impact on the SIMCE score. These results reveal that these types of administrative dependence increase education quality by 35.42 and 8.47 SIMCE points, respectively. However, when the school is public (PUB), school performance is significantly reduced by 6.02 SIMCE points. These results demonstrate the significant discrepancy in the performance of public and private schools, and that this difference is supported by the socioeconomic gap. In terms of public policy, our results also support the relevance of the subsidized private school system, to the extent that it reduces the achievement gap between public and private schools, and allows students to choose schools with better performance. These results agree with various empirical studies and confirm that the administrative dependence of schools is a relevant factor for the design of public education policy in Chile (Mizala and Romaguera, 2001; Gallego, 2002; Sapelli and Torche, 2002; Sapelli and Vial, 2002; Greene and Kang, 2004; Redondo et al., 2005; Muralidharan and Kremer, 2006; Shih, 2012).

Table 4. Impact of competition and SEP law on education quality in Chilean schools.

Explanatory variables	Dependent Variable: EQ measured by average SIMCE language and mathematics scores					
	Model (1)			Model (2)		
Constant	211.09***	219.26***	225.04***	229.17***	226.62***	221.47***
	(76.95)	(82.03)	(79.85)	(90.37)	(89.31)	(93.13)
EQ_{t-1}	0.294***	0.301***	0.285***	0.331***	0.313***	0.347***
	(20.46)	(26.95)	(23.27)	(30.21)	(29.77)	(28.84)
SEP law and effect of competition						
Dummy SEP_{t-1}	6.372***	4.925***	5.471***	5.158***	5.031***	4.423***
	(4.17)	(4.34)	(5.16)	(4.67)	(4.29)	(3.83)
COMP	39.026***	40.932***	43.334***	43.946***	46.295***	42.978***
	(9.36)	(10.31)	(11.28)	(9.25)	(10.95)	(9.77)
$COMP^2$	-25.339***	-27.021***	-24.912***			
	(-7.28)	(-8.11)	(-8.29)			
Administrative dependence of schools						
PRIV	35.428***			31.365***		
	(6.31)			(5.24)		
PSUB		8.475***			7.747***	
		(4.39)			(3.98)	
PUB			-6.027***			-5.626***
			(-4.76)			(-4.89)
Competition among schools from the same sector						
COMP × PRIV				13.472***		
				(3.52)		
COMP × PSUB					4.369***	
					(3.92)	
COMP × PUB						-4.102***
						(-4.06)
Other control variables						
SIZE	0.856	0.933*	0.812	0.794	0.871*	0.764
	(1.65)	(1.74)	(1.56)	(1.33)	(1.69)	(1.14)
SOC	3.038***	2.896***	3.389***	3.119***	2.902***	2.779***
	(3.79)	(2.98)	(4.02)	(4.11)	(3.09)	(3.46)
URB	45.337***	46.194***	49.261***	42.375***	41.904***	45.634***
	(5.22)	(5.57)	(6.25)	(5.05)	(5.46)	(5.93)
Observations	68480	68480	68480	68480	68480	68480
Wald	327.02***	346.83***	339.51***	387.35***	371.44***	366.72***
Sargan Test	40.93	38.74	41.62	44.39	45.24	40.96
AR1	-3.28***	-2.98***	-3.19***	-3.57***	-2.85***	-3.34***
AR2	-0.85	-1.02	-0.94	-1.13	-0.76	-0.97
Dummy year	Yes	Yes	Yes	Yes	Yes	Yes
Dummy level	Yes	Yes	Yes	Yes	Yes	Yes
Dummy region	Yes	Yes	Yes	Yes	Yes	Yes

Notes: z-statistics in brackets. Superscripts ***, ** and * indicate significance at 1%, 5% and 10%, respectively. Source: Authors' elaboration.

According to several national and international studies, the competition in the Chilean education sector has a positive and significant effect on education quality (Epple and Romano, 1998; Belfield and Levin, 2002; Auguste and Valenzuela, 2004; Chumacero et al., 2016). On average, competition (COMP) generated an increase of 42.75 SIMCE points (average of coefficients from Table 4). However, competition in Chile's primary education system had a non-linear impact on school quality. This result supports hypothesis H1. The inverted U-shape of the relationship indicates that the initial positive effect of competition on the quality of education is reversed for high levels of competition, generating an adverse selection problem that reduces school performance.

The results of model 2 described in Table 4 indicate that competition had a differentiated impact on education quality when considering the administrative dependence of Chilean schools. The interactive variables (COMP × PRIV) and (COMP × PSUB) had a positive and significant impact on the performance of Chilean schools, indicating that a higher degree of competition in private and subsidized private schools increased their SIMCE scores by 13.47 and 4.36 points, respectively. However, the interactive variable (COMP × PUB) showed that competition between public schools reduced their performance by 4.10 SIMCE points. These results support hypothesis H2. These findings indicate that public schools compete in a segment of the education system characterized by students of lower school performance, while non-public schools compete for higher-achieving students who meet their most demanding study plans. Therefore, public schools do not compete for the same students with private or subsidized private schools, generating an adverse selection mechanism that affects their performance. The design of public policy in education must consider that although competition is a mechanism that promotes performance in Chilean schools, its impact depends on the school administrative dependence and on how competition occurs within the same type of sector or dependence.

Regarding the effect of the SEP law on education quality, this was positive and significant. The average of the coefficients of the SEP variable revealed a significant increase of 5.23 SIMCE points in the performance of Chilean schools. This result corroborates hypothesis H3. According to various previous empirical studies and from a general perspective, the voucher subsidy system, such as the SEP law, has been an effective public policy mechanism that has improved schools' performance (Valenzuela et al., 2013; Correa et al., 2014; Mizala and Torche, 2013, 2017). Even when analyzing the negative impact of the PUB variable (coefficient whose value was -5.62) on education quality, it is concluded that the implementation of the SEP law reversed the lower performance of public schools, thus being an educational policy with a deterrent effect on poor academic performance.

Table 5 shows the results of the regression (3). The consistency tests of the GMM estimators revealed the presence of first order autocorrelation (AR1) and absence of second order autocorrelation (AR2). On the other hand, the Sargan test revealed that the models were instrumentally overidentified. Additionally, the control variables SIZE, SOC and URB showed the same results as those described in Table 4. Thus, a higher socioeconomic level and the urban location of the schools are associated with higher school performance in the SIMCE test, whereas size did not have a significant impact. The results described in Table 5 also reveal that the SEP* variable had a positive and significant impact on the education quality in Chilean schools, which confirm the results described in Table 4.

Table 5. Effect of competition and administrative dependence since the implementation of the SEP law.

Explanatory variables	Dependent Variable: EQ measured by average language and mathematics SIMCE scores.		
	Model 3		
Constant	228.05***	221.34***	232.19***
	(30.04)	(29.61)	(33.63)
EQt-1	0.336***	0.358***	0.319***
	(17.36)	(18.95)	(15.47)
SEP law and effect of competition			
SEP*	9.374***	8.031***	8.126***
	(4.92)	(4.03)	(3.94)
COMP	40.264***	43.628***	41.839***
	(5.36)	(6.12)	(5.03)
Administrative dependence of schools			
PRIV	30.734***		
	(4.72)		
PSUB		9.078***	
		(4.14)	
PUB			-5.167***
			(-3.60)
Competition among schools from the same sector since SEP			
SEP*× COMP × PRIV	11.321***		
	(3.90)		
SEP*× COMP × PSUB		3.205	
		(1.17)	
SEP*× COMP × PUB			-4.562***
			(-2.88)
Other control variables			
SIZE	0.773	0.816	0.705
	(1.03)	(1.18)	(0.98)
SOC	4.117***	3.981***	4.269***
	(3.14)	(2.76)	(3.39)
URB	40.265***	39.338***	43.162***
	(4.19)	(3.76)	(3.91)
Observations	68480	68480	68480
Wald	298.04***	314.93***	308.81***
Sargan Test	35.56	33.91	38.09
AR1	-3.85***	-3.33***	-3.08***
AR2	-0.91	-1.10	-0.87
Dummy year	Yes	Yes	Yes
Dummy level	Yes	Yes	Yes
Dummy region	Yes	Yes	Yes

Notes: z-statistics in brackets. Superscripts ***, ** and * indicate significance at 1%, 5% and 10%, respectively. Source: Authors' elaboration.

Table 5 shows the effect of competition in schools of the same administrative dependence since the implementation of the SEP law in Chile. The (SEP*× COMP × PRIV) variable had a positive and significant impact on education quality. Since the implementation of the SEP law, competition between private schools increased performance by 11.32 SIMCE points on average. However, the variable (SEP*× COMP × PUB) had a negative effect, as competition between public schools reduced scholar performance by 4.56 SIMCE points. Competition between subsidized private schools did not have a significant impact on education quality. All these novel results support hypothesis H_4 and indicate that the implementation of the SEP law, despite reversing the low performance of public schools, generated a cost in the education quality in Chile. This law conditioned the competition between schools of the same administrative dependence, and with this the disparity and inequality in performance between public and private schools deepened.

These results have two important implications. First, it has been proven that private schools focus their efforts on attracting students with high academic performance in accordance with their curriculum. Second, competition among public schools focuses on low-performing students. Despite the fact that the SEP law helps mitigate the lower quality of public schools, the quality gap that separates them from private schools remains wide. This gap prevents these students from moving to higher quality schools. In fact, competition among subsidized private schools has not had a significant effect on education quality since the introduction of the SEP law. This evidence shows that these schools do not compete for SEP-subsidized students, but for higher-performing students. Thus, the socioeconomic differences between public and private schools are so big that they prevent subsidy policies from having a greater effect on education quality (Donoso and Hawes, 2002).

4.3. Robustness analysis

This section presents the robustness analysis through multilevel mixed models. These models included three levels: region, district and schools. Models (4), (5) and (6) corresponded to a static specification for models (1), (2) and (3), respectively, because they did not include the first lag of education quality. Therefore, the multilevel mixed models were:

$$EQ_{ijk} = \beta_0 + \beta_1 SEP_{it-1} + \beta_2 COMP_i + \beta_3 COMP_i^2 + \sum_m^M \beta_m X_{mi} + u_i + u_{jk} + \varepsilon_{ijk} \quad (4)$$

$$EQ_{ijk} = \beta_0 + \beta_1 SEP_{it-1} + \beta_2 COMP_i + \beta_3 DEP_i + \beta_4 \left(DEP_i \times COMP_i\right) + \sum_m^M \beta_m X_{mi} + u_i + u_{jk} + \varepsilon_{ijk} \quad (5)$$

$$EQ_{ijk} = \beta_0 + \beta_1 SEP^* + \beta_2 COMP_i + \beta_3 DEP_i + \beta_4 \left(SEP^* \times COMP_i \times DEP_i\right) + \sum_m^M \beta_m X_{mi} + u_i + u_{jk} + \varepsilon_{ijk} \quad (6)$$

Where EQ_{ijk} is the education quality measured by the simple average between the language and mathematics SIMCE scores of school i belonging to district j in region k. The control variables SEP_{t-1}, *SEP**, *COMP*, *DEP* and the regressor grouped in the X_{mi} matrix, which represent the fixed component of the multilevel mixed model, are defined similarly to models (1), (2) and (3). The multilevel mixed model has random components that are explained by the correlation between the observations at the different levels. This is an advantage over dynamic panel data models with fixed effects that normally assume that unobservable heterogeneity can be modeled through dummy variables that do not consider correlational behavior within different levels. In the three-level model, the education quality of schools is correlated within each region and within the same district in the same region. These models also include dummy variables to control the heterogeneity across time and grade. On the other hand, u_i is the random component associated to school i and u_{jk} is the random component related to district j in region k. Finally, ε_{ijk} is the random residual.

Table 6. Impact of competition and SEP law on education quality in Chilean schools.

Explanatory variables	Dependent Variable: EQ measured by average SIMCE language and mathematics scores								
	Model (4)			Model (5)			Model (6)		
Constant	165.13***	164.48***	168.78***	181.78***	180.51***	184.42***	179.68***	179.19***	184.45***
	(13.20)	(12.85)	(13.93)	(17.73)	(15.84)	(15.23)	(15.56)	(14.60)	(18.24)
SEP law and effect of competition									
SEP*							11.239***	13.635***	9.511***
							(5.13)	(6.52)	(6.05)
Dummy SEPt-1	4.244***	5.465***	4.463***	5.258***	6.401***	5.456***			
	(4.21)	(3.97)	(5.37)	(4.13)	(5.52)	(4.35)			
COMP	27.002***	27.606***	28.266***	31.989***	33.872***	29.374***	32.567***	29.917***	30.204***
	(3.76)	(3.69)	(3.82)	(6.66)	(5.89)	(5.19)	(5.68)	(4.55)	(5.13)
COMP2	-17.722***	-16.035***	-16.231***						
	(-4.62)	(-4.41)	(-4.47)						
Administrative dependence of schools									
PRIV	26.777***			25.056***			22.141***		
	(6.88)			(5.63)			(6.85)		
PSUB		6.709***			7.015***			6.332***	
		(3.19)			(4.33)			(7.16)	
PUB			-5.165***			-4.506***			-6.548***
			(-3.75)			(-3.27)			(-5.19)
Competition among schools from the same sector									
COMP × PRIV				16.944***					
				(4.43)					
COMP × PSUB					3.887***				
					(3.03)				
COMP × PUB						-3.803***			
						(-4.51)			
Competition among schools from the same sector since SEP									
SEP*×COMP×PRIV							13.494***		
							(4.86)		
SEP*×COMP×PSUB								4.751**	
								(2.38)	
SEP*×COMP×PUB									-5.921***
									(-5.09)
Other control variables									
SIZE	4.240***	3.888**	4.086***	3.790***	3.528***	3.687***	3.999***	3.629**	3.292**
	(3.81)	(2.03)	(2.74)	(5.06)	(2.76)	(4.03)	(3.56)	(2.18)	(2.25)
SOC	6.340***	7.331***	6.794***	6.348***	7.313***	6.816***	6.618***	7.382***	6.803***
	(7.86)	(8.37)	(8.41)	(7.09)	(6.04)	(5.69)	(5.48)	(6.91)	(5.61)
URB	27.456***	27.805***	28.050***	27.443***	27.856***	29.093***	27.538***	27.920***	28.143***
	(6.18)	(6.64)	(7.90)	(6.27)	(7.02)	(8.25)	(6.83)	(6.34)	(7.50)
Wald	786.74***	755.38***	713.54***	809.03***	817.26***	811.39***	794.42***	802.63***	799.06***
Level Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ICC Region	0.173***	0.175***	0.177***	0.169***	0.172***	0.174***	0.171***	0.172***	0.173***
Level Region-District	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ICC Region-District	0.273***	0.264***	0.267***	0.268***	0.262***	0.265***	0.270***	0.260***	0.263***

Notes: z-statistics in brackets. Superscripts ***, ** and * indicate significance at 1%, 5% and 10%, respectively. Source: Authors' elaboration.

Table 6 presents the results of models (4), (5) and (6). The intraclass correlations (ICC) at the region and district level in the same region were significant. The third-level intraclass correlation corresponded to the region level and indicated that the education quality of schools is positively correlated over the years in the same region. The second-level intraclass correlation indicated that education quality of schools was also positively correlated over the years in the same district and the same region. Thus, the district and region random effects constituted approximately between 26.0% and 27.3% of the total residual variance. Relevant variables such as competition (*COMP*), competition squared ($COMP^2$), voucher subsidy (SEP_{t-1} and *SEP**) and the interactive variables ($SEP^* \times COMP_i \times DEP_i$) had the same effects as those described in models (1), (2) and (3). These results are robust and validate the hypotheses H1, H2, H3 and H4.

5. Conclusions and discussion

The design of public education policy must consider several factors to promote quality improvements. International studies have indicated that competition within the education sector, as well as subsidies granted by the state, are relevant for education quality.

This study provides evidence of the relationship between the degree of competition and the granting of subsidies to students, and their effects on education quality in Chile. The empirical contributions of this research can be summarized in two points. First, our research confirms that competition in the education sector has a positive effect on education quality. This is a result that aligns with several empirical studies. However, the effect of competition is nonlinear, and it has an inverted U-shape. This type of relationship indicates that the impact of competition is not persistent on the education quality, because when there are high levels of competition, the quality of education is reduced. Considering that schools seek to attract students who best represent their curriculum, concentrating enrollment in a small number of schools could harm the quality of these schools. These results are relevant for policy makers because they offer empirical support that indicates that public education policy aimed at promoting competition does not has permanent effects on education quality. Therefore, policy makers must regulate competition in the education sector to avoid an adverse selection effect of enrollment on academic performance. Our results even showed that competition had different effects on school performance according to the administrative dependence of the schools. A higher degree of competition generates significant increases in education quality in both private and subsidized private schools. However, competition among public schools lowered their performance. These results indicate that competition is focused within schools of the same administrative dependence, and therefore seeks specific students. In general, non-public schools compete and select students for their ability to best reflect the educational curriculum. These students are also often characterized by favorable socioeconomic conditions and higher academic performance. On the other hand, public schools compete for students who have less favorable academic and socioeconomic conditions, which limit the possibility of obtaining better school performance. Such conditions even cause students to not be considered for non-public schools. Policy makers should consider that educational policies aimed at promoting competition should not be universal and should be oriented according to the type of administrative dependence.

Second, the introduction of the SEP law increased the education quality in Chilean schools. This result demonstrated that the SEP law is effective in terms of school performance and has been able to mitigate the poor performance of public schools. Even the implementation of the SEP law conditioned the effect of competition on education quality. Since its implementation, competition among private

schools has had a positive influence on education quality, while competition among public schools has had a negative impact. Among subsidized private schools, the conditional effect of competition was not significant. As noted above, the SEP law has a positive effect on education quality with which public schools compensate for their poor performance. But these results also reveal that the SEP law is a policy that does not correct or reduce the existing gap with respect to private schools. The strengthening of competition among private schools, with the consequent improvement in school performance, is offset by the negative effect that competition has on performance in public schools. These novel findings are also useful for policy makers because they guide the improvement of the SEP law to deepen its positive impact on education quality and promote student mobility towards better quality schools.

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