

**School Choice and Equity:
The impact of voucher schools on educational inequality in the Chilean case*.**

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Abstract.

The majority of discussion of the impact of voucher schools on equity and educational opportunities has been premised on ideological positions rather than on evidence. This paper analyzes empirical evidence on achievement differences between public, private-voucher and private schools in Chile from 1996 to 2005. Specifically, I explore Milton Friedman's hypothesis that the implementation of voucher systems can end the state monopoly of education, and thus, the following introduction of free competition and free choice would make possible the reduction of educational inequality between students and especially create greater educational opportunity for the poorest students. I use Theil's T-Statistic to analyze the performance of a total of 1,074,181 4th-grade elementary school students on the SIMCE test, Chile's national exam to measure academic achievement in primary and secondary schools, in four different years: 1996, 1999, 2002 and 2005. This paper shows that private-voucher schools have not only not reduced educational inequality, but also, that they have actually increased segmentation of the education system according to socioeconomic status (SES) of students in the Chilean case.

Introduction

The majority of research about educational stratification and educational inequality has dealt almost entirely with the industrialized world. Moreover, there are few studies on macro-level effects of school choice (voucher system) programs on the inequality of education as a whole. The main reason is because almost all voucher programs have been implemented in specific contexts: isolated by geography, socioeconomic status, or time. In brief, the long run questions dealing with consequences of inequality, stratification, and quality of voucher systems are still open and undecided.

In this sense, Chile provides an interesting case because it is a late-industrializing country and experienced radical privatization reform of its educational system during the eighties as part of a market orientated transformation by General Augusto Pinochet's regime (Torche 2003). In addition, the Chilean voucher system operates nationwide and has been in place (almost unaltered) for more than 25 years. Also, the implementation of voucher systems in Chile during the eighties was an idea conceived, designed and implemented in 18 months (Schiefelbein 1992). Therefore, the Chilean voucher system is useful not only to study the effects or trends in education in a developed country but also to evaluate the subsequent changes of privatization reform, specifically the role of vouchers on educational inequality in Chile.

Have voucher schools been an effective policy to reduce educational inequality in the Chilean case? One of the fundamental arguments of voucher advocates in Chile was that a publicly monopolized education system restricts "good" schooling, and that, in practice, even under an "open enrollment system" of public school choice, more effective public schools declare themselves "full," and poor schools continue to operate without threat of further competition. Extending vouchers to private schools thus would increase choice by expanding the number of *good* school places available (Carnoy 1998).

This paper explores the impact of private-voucher school implementation as a strategy to reduce educational inequality in Chile during Pinochet's regime. I use Theil's T-Statistic to analyze the *Sistema de Evaluación de la Calidad de la Educación* (Measurement System of Educational Quality (SIMCE)), which is Chile's national exam to measure academic achievement in primary and secondary schools. Using this data, I consider the performance of a total 1,074,181 4th-grade elementary school students on this test in four different years: 1996, 1999, 2002 and 2005. The variables analyzed with Theil's T-Statistic will be: regional location

of each school (using all 13 regions in Chile), school type (public, private-voucher and private-paid), and school's socioeconomic group (low, medium-low, medium, medium-high and high).

Although the available information to study the Chilean case is reliable and extensive, it has some limitations. First, the data analyzed in this paper corresponds to a specific time period (1996-2005) of the privatization reform and does not allow analysis of all periods of implementation of the voucher system in Chile. Second, the democratic period (from 1990 to 2007) has made a strong and systematic effort to address public school performance improvement through education policy. Therefore, it is difficult to isolate the effect of policy intervention on changes of educational inequality during this time period.

This paper is organized into three main sections. The first one explores theoretical approaches to understanding why there is persistent educational inequality in modern societies. My focus will be on two theoretical approaches for understanding educational inequality in modern society. The first is a macro-sociology theory called "Reproduction Theory" that is based upon Marxist thought. The second, called the "Effectively Maintained Inequality" Theory (EMI), is one of the most recent explanations for educational inequality. The second section looks at different explanations about the government's role in education and the strategies or educational policies to reduce inequality and improve the quality of education. I will focus on the arguments supporting the implementation of voucher schools such as competition and free choice. In the last section, I explore my research question: Are voucher schools an effective policy to reduce educational inequality? I will analyze the SIMCE test data with Theil's T-Statistic to examine the impact of private-voucher school implementation on the Chilean system.

Why is there persistent educational inequality? Two Theoretical Approaches

There are at least four theoretical approaches that research, academics, and policymakers use to understand and explain persistent educational inequality in modern societies. However, I will focus on only two of them. First, “Reproduction Theory” is a macro-sociologic approach to understand persistent educational inequality. This approach claims universal validity with scarce attention to specificities of national and regional contexts. In contrast, the second approach, called “Effectively Maintained Inequality Theory” (EMI), looks at specific institutional arrangements and mechanisms of educational systems and policy intervention to explain educational inequality.

According to Reproduction Theory, education systems reproduce economic class differences that already exist in society. In fact, schools tend to reproduce and even exaggerate inequalities of race, class, and gender (Bourdieu and Passeron 1977). Hence, the role of education is to teach particular status culture, such as vocabulary, styles of dress and behavior, according to dominant culture. The elite control economic, social and political resources as well as the education system, which is the most effective filter in the reproductive process of hierarchical society. Poor achievement of minority groups in a society then is not something inherent in cultural differences (Harker 1984). Rather, the educational system reproduces the structure of power relations and symbolic relations between classes, thus contributing to and continuing unequal distribution of cultural capital among these classes (Bourdieu 1973).

The strategies highlighted by reproduction theories vary, but they tend to emphasize the cultural dimensions of inequality in the form of socialization by the school into hierarchical social roles that are necessary for capitalism (Bowles and Gintis 1976), the use of language to learn and express class differences (Bernstein 1971), and the rewarding of cultural capital¹ that upper-class students build naturally at home and less-privileged students lack (Bourdieu 1973).

¹ Cultural capital refers to “the inherited or acquired linguistic codes, disposition, tastes, modes of thinking, and other types of knowledge or competencies deemed legitimate by the dominant group or groups in society” (Dance, L. J. 2002).

In brief, the latter theory argues that the educational system reproduces all the more perfectly the structure of the distribution of cultural capital among classes (and sections of classes) in that the culture which it transmits is closer to the dominant culture and that the mode of inoculation to which it has recourse is less removed from the mode of inoculation practiced by the family (Bourdieu 1973).

However, the “Effective Maintained Inequality Theory” (EMI) argues that when saturation or achievement of a particular level is reached, “quantity inequality” declines and may then be replaced by “quality inequality”, that is, the advantaged groups will be able to obtain educational achievement that provides them with improved opportunities for further attainment. This approach developed by Samuel Lucas (2001) is one of the most recent theories explaining educational inequality and educational stratification. Effectively Maintained Inequality Theory posits that socioeconomically-advantaged actors secure for themselves and their children some degree of advantage wherever advantages are commonly possible. Hence, if quantitative differences are common, the socioeconomically-advantaged will obtain quantitative advantages, and if qualitative differences are common, the socioeconomically advantaged will obtain qualitative advantage. Thus, when a particular level of schooling is not universal (i.e., high school completion throughout the first half of the 20th century in the United States), the socioeconomically advantaged use their advantages to secure that level of schooling. Once that level of schooling becomes nearly universal, however, the socioeconomically advantaged seek out whatever qualitative differences there are *at that level* (AP, IB and honors classes versus regular classes, for example) and use their advantages to secure quantitatively similar but qualitatively better education (Lucas 2001).

The majority of researches on educational inequality focuses on “quantity inequality,” such as what level of education different socioeconomic groups obtain and how much enrollment

and drop-out rates differ among class, race, and gender. While “quality inequality” highlights the fact that education systems are multidimensional, not only isolated variables or dimensions can explain differences between students. In fact, “quality inequality” points out that there are different sub-sectors, such as tracks and school sectors, which provide unequal opportunities for further attainment (Torche 2003).

In this paper, I use Effectively Maintained Inequality Theory (EMI) to frame and explore educational inequality in Chile. I will especially make use of the concept of “quality inequality” to explore educational inequality and different dimensions of schooling to better understand the influence of private voucher schools. Particularly, through the SIMCE test data, I can explore “quality inequality” among Chilean students.

In the next section, I explore different approaches to the government’s role in education and ways to reduce persistent educational inequality. Particularly, I focus on Milton Friedman’s theory that the introduction of free choice and the ensuing competition in the education system might reduce inequality and increase the quality of education for all.

How do we reduce educational inequality? From Government’s Role in Education to Voucher Systems

Since the emergence of political economy as an autonomous body of knowledge in the late eighteenth century, economists have vigorously pursued the study of education and the particular role that governments play in this area. Adam Smith understood education as an important motor of the labour market because it provided workers with different abilities and skills, and communities then benefited from these productive outcomes of skill differentiation. Moreover, education was important because it offered what modern economists would call “social benefits of education.” For example, education improved moral standards and supplied more stability to society. According to Teixeira (2006), Smith clearly favoured the role of private

initiatives over public ones because he relied on the effectiveness of competition, which, by stimulating rivalry and emulation, promoted excellence in terms of educational provision.

John Stuart Mill, a classical political economist, believed, like Smith, that education had various benefits at the individual and social levels, as well as moral, political, and economic impacts. At the same time, he saw that a specific group was almost always much better educated and more prepared to exercise power, whereas all others were generally less educated and remained in the lowest levels of society. Stuart Mill saw this as a reason for more public intervention and government supervision of these endowments, whereas Smith, on the other hand, saw this as an argument for less public intervention (Teixeira 2006).

Certainly, the most influential author about the state's role in education during the last century has been Milton Friedman. In his book *Capitalism and Freedom* (1962), Friedman examines the contemporary debate about the role of markets and governments in education. According to Friedman (1962), the contemporary role of the government in education is mostly taken for granted, and thus leads to what he calls a "substantive nationalization of the education sector." However, he points out that this was not always the case, especially in the U.S. where there were three main reasons for expansion. First, education was mostly considered a technical monopoly. Second, it aimed at creating a core of common values that was particularly relevant due to the large and diverse inflows of immigrant populations. Finally, an efficient technical administration to subsidize individuals directly, instead of through institutional funding, was lacking (Teixeira 2006).

In order to understand educational vouchers, we must first recognize the role of schools in a democratic society typified by racial, regional, and socioeconomic differences. In this context, it is central to comprehend the dual function that schools play in offering both social (public) and private (family) benefits. First, educational systems give a common set of

experiences, values, and skills for all children. Such educational conditions are the basic aspects in creating equal lifestyles and preparing the young for democratic citizenship and participation in a socially cohesive society. Second, in a free and democratic society, parents have the right to choose how and where their children should be educated (politically or religiously). Within this context, educational choice proposes that parents should be able to choose the types of school that best match their child rearing preferences.

According to Friedman (1962), the initial function of the state was mostly justified as a mechanism of promoting common values and behaviors necessary for a democracy through general and compulsory education. However, he thought that government's role in education should be reduced and that a government monopoly needed to be replaced with a free market of competitors as society advanced.

“The subsidization of institutions rather than people has led to an indiscriminate subsidization of all activities appropriate for such institutions, rather than of activities appropriate for the state to subsidize” (Friedman 1962). Therefore, Friedman suggests that the most funding should be directed to students themselves in a sort of voucher mechanism. Friedman argued that the change from institutional to individual funding would increase the competition between schools and promote quality, efficiency, differentiation, and innovation between educational institutions. Additionally, it would encourage a larger multiplicity of school types, which he principally linked with private association.

Educational vouchers refer to a system of public educational finance in which parents are given a tuition certificate by the government that can be used to pay tuition at any “approved” school, public or private. Many types of schools, including those seeking profit, would compete for students and their vouchers. Presumably, competition would lead to a greater range of choice

and rising efficiency and innovation in education as schools have financial incentives to attract and retain their enrollments (Levin 2002).

When we explore the multitude of exchanges on educational vouchers, four criteria emerge: a) freedom of choice, b) productive efficiency, c) equity, and d) social cohesion.

- a) Freedom of choice: This criterion refers to the right of parents to choose schools for their children based upon relationship values, religious teachings, political outlook, etc. Private schools offer and emphasize this aspect of choice, and thus, must keep up with which childrearing practices are popular and valued at any given time.
- b) Productive efficiency: This criterion refers to the improvement (maximization) of educational outcomes for any given supply limit. Voucher schools assume that competition among schools to obtain students (voucher) will develop strong incentives not only to satisfy student and parent requirements but also to improve educational productivity (reduce drop out rates, increase enrollment, etc).
- c) Equity: This point refers to a universally accepted goal of schooling in modern society: equal access to educational opportunities, resources, and outcomes regardless of gender, social class, race language, and geographic location of students. Voucher supporters argue that the ability to choose schools will open up possibilities for students who are stuck in inferior neighborhood schools. However, voucher detractors argue that this system will create greater inequalities because less educated and lower income parents are poorly informed on how to choose “the best school” for their children.
- d) Social cohesion: This criterion incorporates one of the main goals of schooling in democratic societies: the similar educational experiences for all students to permit to children to grow into adulthood as full participants in social, political, and economic institutions. A democracy requires that all its members have a similar background in different areas,

primarily political outlook, values, language, and behavior, for effective economic and social participation. The social preparation for social cohesion is similar to what Friedman (1962) has called the “neighborhood effects” or “societal benefits” of education that justify public funding of education.

The Chilean Educational System.

The Chilean educational system is organized into three levels: the primary level with eight years of schooling; the secondary level with four years (where students can choose between vocational or academic high schools); and the tertiary level with three different modalities: colleges, professional institutes, and technical institutes.

Since its beginning, Chilean education has been highly segmented and persistently unequal. For example, the high school graduation rate of children who were starting the eighth grade in 1970 was 100 percent for children of university-educated parents but only 32 percent for children of parents with a secondary education, 12 percent for children of parents with a primary education, and 3 percent for children of parents with no education (Schiefelbein and Farrell 1982). These findings are consistent with the year 2000 student completion rates at primary, secondary and tertiary levels according to socioeconomic status. Whereas 99.1 percent of children in the wealthiest income quintile completed the primary level in 2000, only 71.9 percent of children in the poorest quintile did so. On the secondary level, 30 percent of the children in the poorest quintile complete secondary school, compared to 95 percent of the children in the wealthiest quintile. Finally, at the tertiary level, only 3.1 percent of the poorest youngsters complete tertiary education, in contrast to 48.2 percent of the wealthiest doing so. (Spilerman and Torche 2004).

Educational Policy in Chile from 1960 to 2000.

During the sixties and seventies, Chilean education policies sought to assure to all of the population the right to elementary education and equal access to high schools. The state's effort to expand education was successful: enrollment reached more than 93 percent at the primary level by 1970, and secondary enrollment rose from 18 percent in the late 1950s to 49 percent in 1970 (Torche 2003).

During the eighties, Pinochet implemented a group of reforms that transformed the structure and financing of the Chilean educational system, strongly decreasing the state's role and expenditure. Funding for education was reduced from 7.2 percent of GDP in 1972 to 2.4 percent in 1990 (Claro 2005), and the Administration of Education was decentralized, in the process transferring control of public schools to more than 300 separate municipalities. This process removed teachers from their status as public employees, their salaries were reduced by a third ($1/3$), and their labor conditions and unions suffered damage. Moreover, it created a mandatory voucher plan (fee per student that transfers implicitly to the chosen school) that gave parents/legal guardians the power to choose between three types of schools for their children's education: 1) private-paid schools, 2) private-voucher schools, and 3) public schools. Type-two and type-three schools receive equal funding from the central government based on average daily assistance of its students, in effect creating an education system in which private and public schools compete for students.

After 1990, the first democratic government following Pinochet implemented extensive education reform that sought to increase equality and improve system quality, especially in elementary and high schools. As a result of these reforms, education spending tripled after 1990. In less than one decade, coverage has increased in elementary and high schools, graduation rates have increased, and drop out and repetition rates have decreased. Moreover, the school infrastructure has improved throughout the whole country, and teacher's salaries have tripled.

Also, the democratic government formally admitted existence of inequality in Chile's education system and focused its efforts on compensatory actions addressed at giving more resources to the places and people with low evidence of capital or educational achievement. Based on the differentiation established in the educational system through subsidies and focalized programs, the government hoped to develop more equality in educational results.

President Patricio Alwyn, who was democratically elected, introduced the first such education policy in 1990 when he took office. P-900 was a program implemented in elementary schools in all Chilean states between 1990 and 2002. P-900 began in March of 1990 as a mechanism that provided technical support and educational materials to the 900 lowest-performing (the bottom tenth) elementary schools on the SIMCE. Its focus was to improve the learning of children who attended public elementary schools in impoverished and rural areas throughout the thirteen regions of Chile. Its objective was to improve test scores of first through fourth graders in reading, writing, and mathematics. Therefore, P-900 delivered specialized educational materials, developed continuing education programs for teachers, and provided additional support for children with learning problems. The goal was that these schools would surpass regional SIMCE averages before the program ended and would then continue to autonomously improve without the program (Garcia-Huidobro 1999).

Until 1997 the program only included primary education (first through fourth grades), but since 1998, it has begun working with intermediate education (fifth through eighth grades) as well. Moreover, since 2001, it added poor elementary schools that had obtained SIMCE scores within the bottom 10th percentile – in other words, the worst schools at the national level. Also, the program incorporated schools slightly above the national bottom deciles as long as they were in the bottom 10th percentile of their regional average and had characteristics of poor administrative management that would not guarantee that they could support themselves.

Therefore, the program initially applied to 909 schools, and with the changes implemented in 1998 and 2001, increased its coverage to 1,450 schools. The P-900 evaluation shows that between 1990 and 2003, two out of every three schools in the program improved, but the remaining one-third showed no change (Garcia-Huidobro 2005).

Data and Measurement.

The SIMCE is a national test taken once a year by all students according to their specific grade level. It is given alternately in elementary school, middle school and high school depending on the year. SIMCE's fourth-grade test measures language and communication skills, mathematics, and overall comprehension of the social and cultural environment in which students live.

Its main objective is to develop an index that will be useful to orient actions and improve programs that seek to enhance the quality of education. The evaluation system is the same for all schools, and its administration is external of independent schools. SIMCE's scores illustrate the performance of schools in different areas (math, reading, and natural comprehension) and the total of students according to:

Each school in comparison with previous years and with other schools.

Each grade level within the same school.

The Ministry of Education (MINEDUC) publishes on its web site each year all of the SIMCE scores. That the information is only available in MINEDUC's web site since 1996 is important because SIMCE utilized a different index in the period from 1990 to 1995, and thus, it is not possible to compare the results between both periods. Therefore, I will use the data in the period from 1996 to 2005 because the information is available, and it is possible to compare the school's performance in this period. Moreover, I am focusing on each school's average math and reading scores because comprehensive SIMCE data are only available for 2002 and 2005.

The data will be analyzed with Theil's T-Statistic, an alternative measure of inequality based on the work of Henry Theil (1967, 1972). He proposed an entropy-based measure of inequality derived from the theory of information. Theil's T-Statistic has many interesting properties and virtues, but one of the most important is that it can be broken down into groups unlike other measurements of inequality, such as the Gini coefficient. If information on the underlying observations includes their membership in groups (which may be race, gender, age, or educational achievement categories, among others), then one can divide the Theil measure of inequality into a component that occurs within each group and components that occur between the groups. The sum of these two components will equal Theil's T as a whole (Galbraith and Berner 2001).

The formula is:

$$\text{Theil's T-Statistic} = \sum_{i=1}^m \frac{p_i}{P} * \frac{y_i}{\mu} * \ln\left(\frac{y_i}{\mu}\right)$$

Sector Analysis

During the military regime (1973-1990), sweeping market-oriented reforms transformed the economy and social welfare system. A major reform of the Chilean educational system was launched in 1981 as part of this transformation (Cox and Lemaire 1999). The reform had two main components: (1) the decentralization of education and (2) the creation of a universal educational voucher system. In the next section, I will explain the scope of these two reforms on the transformation of the Chilean educational system, and I will briefly present in which socioeconomic sector each school (public, private-voucher and private-paid) belongs based upon

the educational reform developed during the military regime. Each one of these sectors is incorporated in the “between group” components of Theil’s T-Statistic.

a) Geographic level (regions)

One component of this reform was the decentralization of public schools. Before the reform, the Ministry of Education centrally controlled all public schools and was responsible for all aspects of their operation, such as paying teachers, maintaining facilities, and designing curriculum. With the reform, school control was transferred to approximately 300 municipalities (Gauri 1998).

Chile is divided into 13 regions, each of which is governed by an Intendente. Every region is further divided into provinces with a *Gobernador Provincial* (provincial government). Each province is then divided into communes which are governed by municipalities, each with its own mayor and democratically elected council. In brief, there are 51 provinces and 346 *comunas* (communes) administrated by 345 municipalities.

This paper does not analyze the contribution of each municipality to educational inequality overall. Instead, I explore regional contribution because each municipality is inside a region, and thus, depends on the regional education department. Moreover, each region possesses particular characteristics (income level, schooling rates, population, etc.) that permit the study of independent components within the larger context of overall educational inequality.

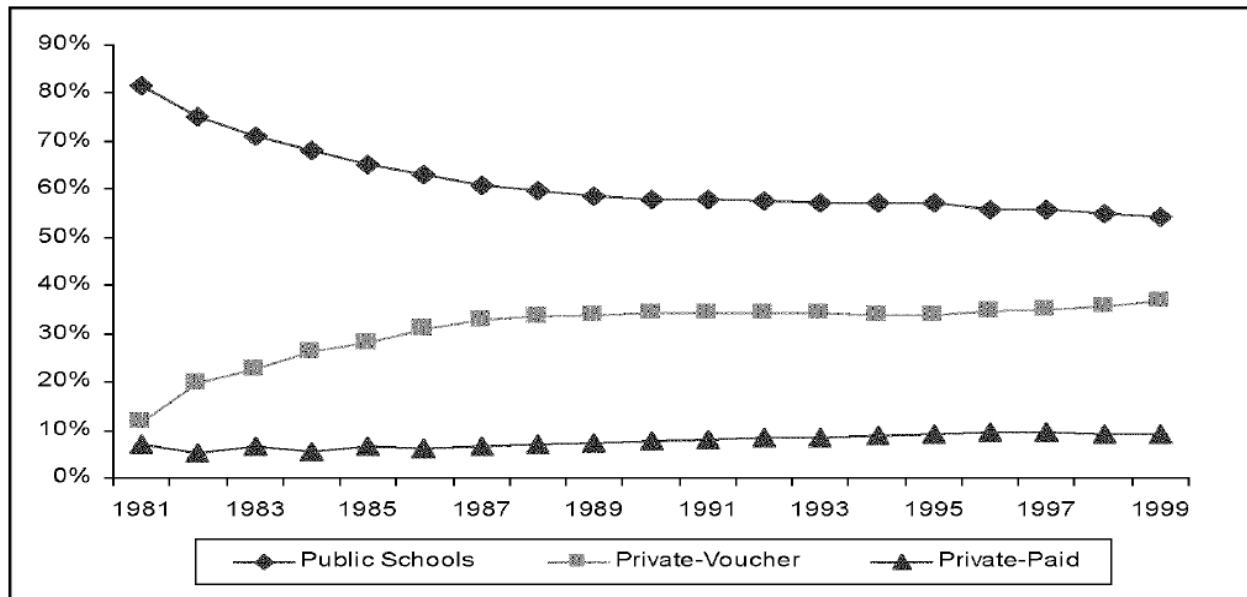
b) School type

Another key component of the privatization reform was the introduction of a “universal educational voucher system.” Within this system, a subsidy is paid to public and private schools on the basis of student enrollment, and parents/legal guardians are free to choose which school they would like their children to attend (Torche 2003). Very importantly, the Chilean voucher system differs significantly from the U.S. voucher system: the Chilean government does not give

a tuition certificate to the family but, rather, pays the subsidy directly to the school that the student chooses. Thus, the Chilean voucher model is known as a “funds follow the student” system (Mizala and Romaguera 2000), where the government pays each school a specific amount of resources for each student that successfully attends classes. For example, if a student is absent three days during the month, this money is discounted from the monthly payment. According to the free market reforms implemented during the eighties in Chile, private schools can decide to increase their tuition regarding their own interests and priorities. Therefore, vouchers only cover a certain percentage of the tuition, and parents need to pay extra money to register their children in these schools. Moreover, the schools can select their students through selection tests, and according to their own criteria. The government does not intervene with the prices of private-voucher school tuition or with the process of selection.

Vouchers allowed a new private sector to be incorporated in supplying public education. This new sector came to be known as “private-voucher schools.” Some of these schools that emerged after the privatization reform were managed by religious and non-profit organizations, but the majority of them were run by private agents that capitalized on education as a profitable business (Hsieh and Urquiola 2003). In 1981, almost 80 percent of Chilean students attended public schools, and 12 percent attended private vouchers. However, after 18 years of privatization reform/implementation, public school enrollment decreased to 55 percent of Chilean students, and 40 percent attended private vouchers.

Figure 1: Primary and Secondary Enrollment from 1981 to 1999.



Source: Ministry of Education Chile (2000).

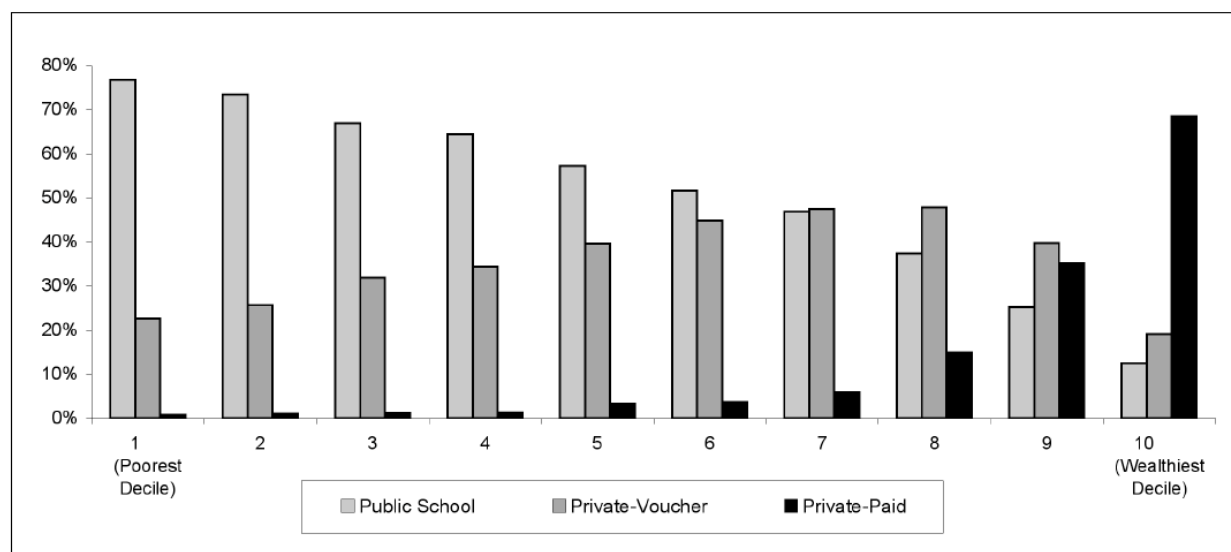
c) School's socioeconomic status (SES)

Chile is one of the most unequal countries in Latin America and presented Gini coefficients of 0.58 in 1900 and 0.57 in 2000 (United Nations 2006). However, Chile presents some particularities: for example, the ratio between the wealthiest and the second wealthiest decile is *twice* as large in Chile as in the United States and England and is one of the largest in Latin America, signifying high elite concentration. In contrast, the ratio between the second poorest and the poorest deciles in Chile is *half* that of the United States and England, indicating that bottom income distribution inequality is much lower in Chile than in these industrialized nations (Szekely and Hilgert 1999).

Historically, the richest group has been educated in private schools receiving no government funding, the lower-middle and middle-income sectors in private-voucher schools, and the poorest sector in public schools. In fact, public schools (elementary schools) are responsible for educating 75.3 percent of students in the poorest quintile and 63.7 percent of the population in the next quintile (Chilean Ministry of Planning 1998). For a visual representation of this data, the next graph presents the distribution of types of schools attended by income

decile in 1990. Clearly, the different income deciles attend different types of school, as explained above.

Figure 2: Types of Schools Attended by Income Decile: Chile 1990.



Source: Torche's calculations based on the 1990 CASEN survey (Chilean Ministry of Planning).

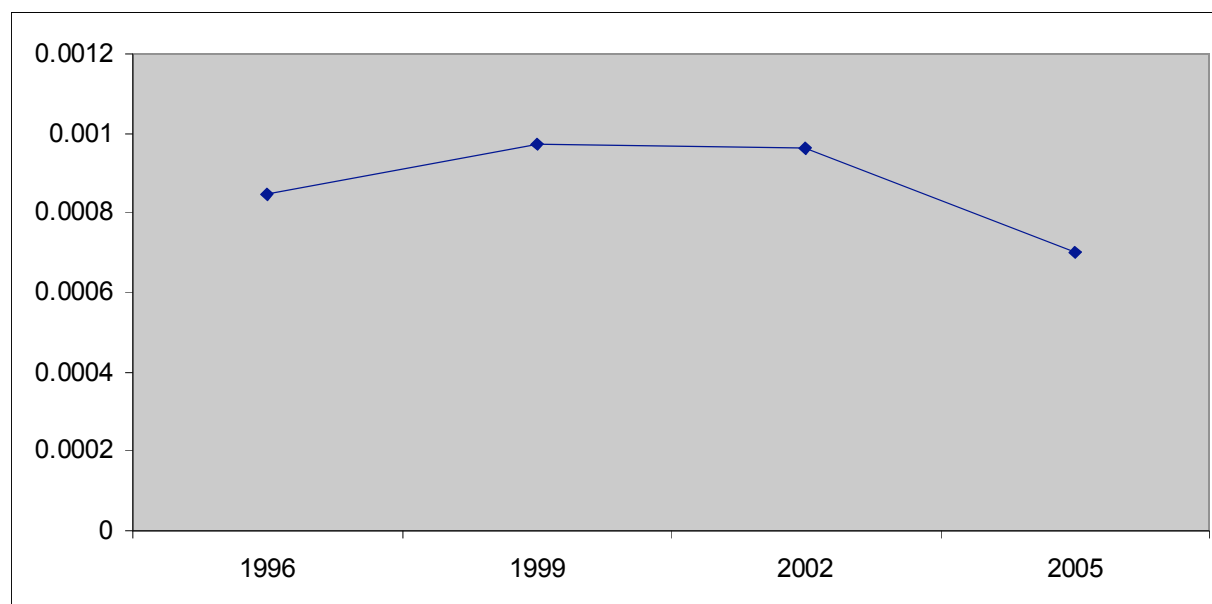
In this paper, I use the five categories of SES established by SIMCE, which classifies which socioeconomic group of students attends which schools. The categories are the following: low, medium-low, medium, medium-high, and high socioeconomic status. Initially, I was going to use data from 1996 to 2005 to analyze the contribution of each sector to national inequality in Chile. However, there are some discrepancies in the data from the period of 1996 to 1999 and 2002 and 2005 that might establish some mistakes in the final results. Therefore, I decided to analyze the most recent period from 2002 to 2005, in which the data does not illustrate incongruity or questionable results.

Results

Figure 3 shows the changes of educational inequality in Chile from 1996 to 2005 in the 4th-grade using all 1,074,181 students' performances on the SIMCE test. The total Theil's T-

Statistic shows that from 1999 to 2002, qualitative inequality increased from 1996 levels; but also, educational inequality decreased during 2005 compared with the three prior periods.

Figure 3: Theil Total.



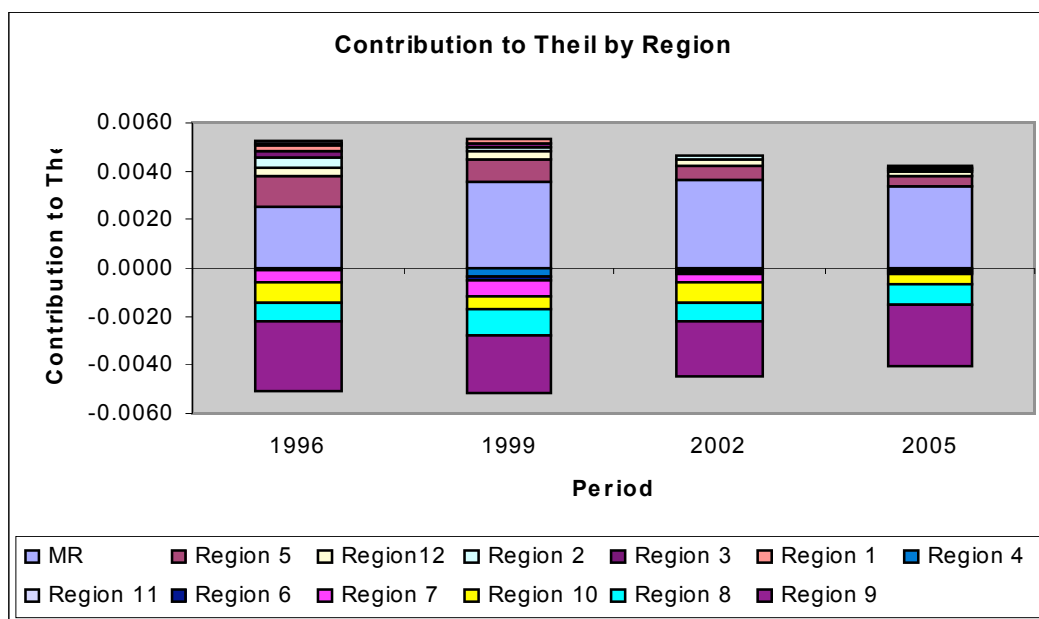
Source: Author's calculations based upon the SIMCE test (Chilean Ministry of Education 2007).

How can we understand these changes? I argue that the reduction we observe, particularly in the period of 2005, is linked to the increase in income level from 1990 to 2005 during the Chilean economic boom. I develop this argument in the next sections.

a) Contribution by geographic level.

This section evaluates changes in educational inequality in Chile from 1996 to 2005. The “between groups” component of Theil’s T-Statistic is used to calculate the contribution of each region to overall educational inequality. This method is useful for achieving a complete analysis of the relative changes in educational inequality by region and to highlight the winners and losers of the Chilean economic boom.

Figure 4: Contribution to National Educational Inequality by Region.



Source: Author's calculations based upon the SIMCE test (Chilean Ministry of Education 2007).

Figure 4 shows us that Chile's southern region has a negative contribution to overall national educational inequality, as do other regions. In fact, regions seven, eight, nine, and ten have all contributed negatively during this period as well. Historically, these regions have been principally linked with agriculture and livestock, and the economic reforms introduced during the military regime had a large impact on their poverty rates. According to *The National Characterization Socio-Economic Survey* (CASEN), the 2003 proportion of the poor population in regions seven, eight, nine, and ten was 25.4 percent. In the northern (regions one, two, three, four, and five) and metropolitan (Santiago) regions, the rate is lower, at only 18.1 percent.

Household income has a strong impact on student achievement. In fact, according to the Chilean Ministry of Education, family income level and highest schooling level obtained by parents are the most important household variables to explain differences in student achievement in school. Therefore, that the poorest regions obtain the lowest scores on the SIMCE test makes sense; in other words, that these areas will have a negative contribution to national inequality is a logical assumption.

In this sense, the case of region nine is interesting because not only is it one of the most unequal and most persistent negative contributor from 1996 to 2005, but also, it has the highest concentration of the indigenous population and is the poorest region in Chile. Nonetheless, the performance of this region has not experienced significant change at any time from 1996 to 2005, despite the democratic period directing Ministry of Education resources toward creating and pioneering a bilingual education system to cater to indigenous students who begin school speaking their native language, rather than Spanish. These education policies that sought to reduce inequality, however, have not made the impact expected.

On the other hand, the Metropolitan (where the capital city of Santiago de Chile is located) and fifth regions present a systematically positive contribution to inequality during this period. Both regions are localized in the same area and represent the most important industrial sectors in Chile. In fact, the main private industries and state institutions, such as universities, enterprises, services, hospitals, national congress and government institutions, are concentrated in these regions. Furthermore, 40.2 percent of the population, 13.2 percent of which are poor or indigent, is concentrated in the metropolitan region, and 10.2 percent of the population, 19.3 percent of which are poor or indigent, are concentrated in the fifth region. In contrast, only 5.7 percent of the population, 29.7 percent of which are poor or indigent, are concentrated in the ninth region (Chilean Ministry of Planning 2003).

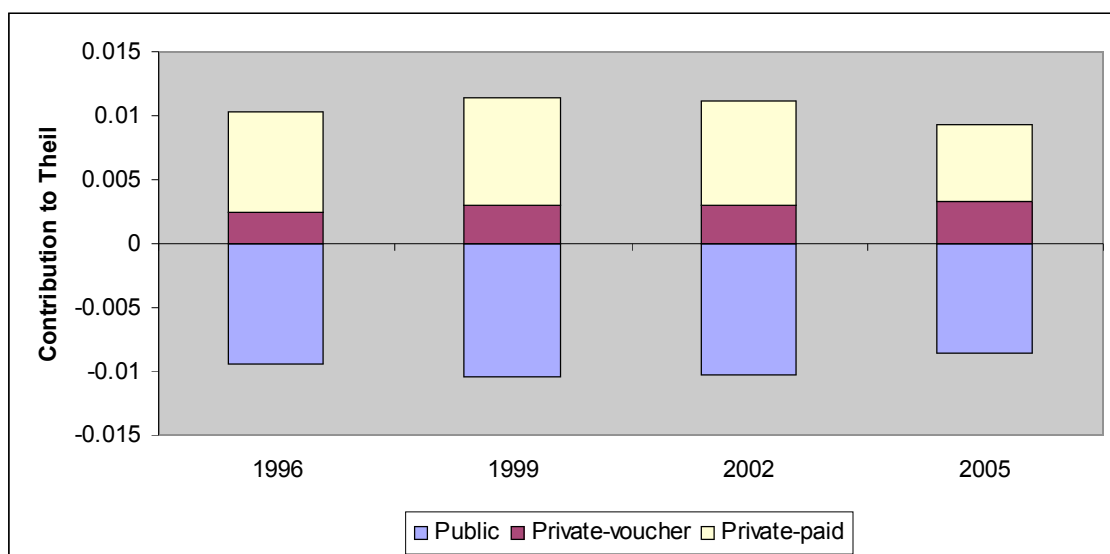
b) Contribution by school type.

In this section, I evaluate the changes in educational inequality in Chile from 1996 to 2005. “The between groups” component of Theil’s T-Statistic is used to calculate the contribution of each school type to overall educational inequality (contribution to total Theil’s T-Statistic). This section is especially important not only because it allows me to explore the impact of voucher schools on educational inequality in the Chilean case but also because I can

analyze the hypothesis of Chilean policy-makers that competition between schools and giving parents free choice reduces educational inequality. According to these military regime officials, private vouchers give the greatest educational opportunities to students from the poorest households. Even though the time period with available data to make these observations is brief (nine years), we can adequately analyze how voucher policy has been working 15 years after its implementation (it started in 1981) and establish the resulting trends.

Figure 5 shows the contribution of public, private-voucher and private-paid schools to educational inequality as measured by SIMCE test scores. In brief, public schools persistently contribute negatively during the period from 1996 to 2005, although there is a slight reduction in this trend over time. On the other hand, private-voucher schools contribute positively during this period and show a slight increase in their positive contribution to overall educational inequality. Finally, private-paid schools make the highest positive contribution to all educational inequality, which is not surprising because in almost all modern societies, private-paid schools are the most unequal. However, there is a decline in the level of this contribution if we compare the period between 1996 and 2005.

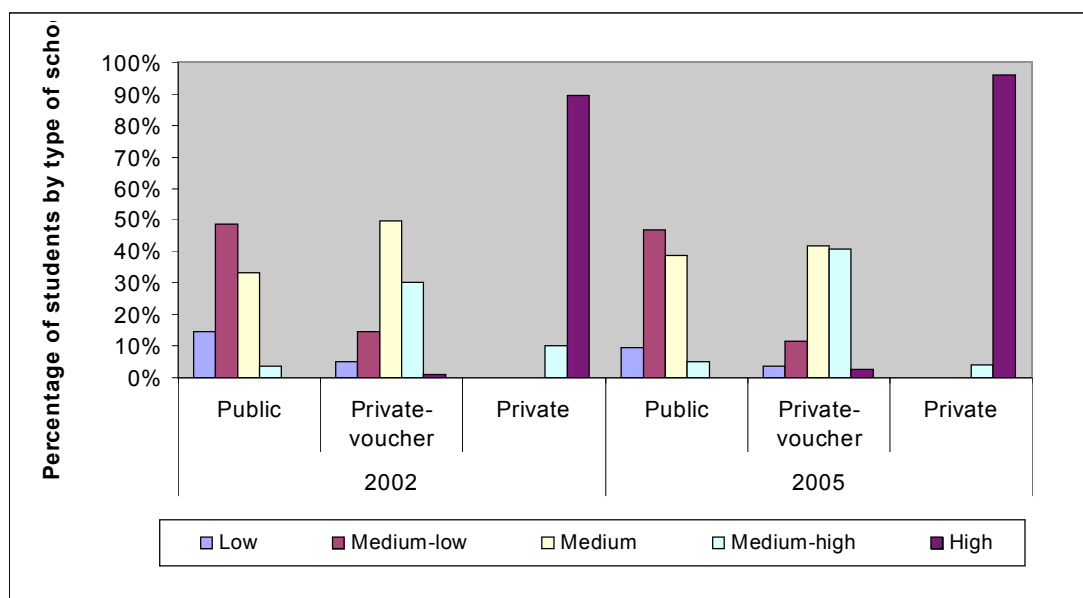
Figure 5: Contribution to Theil by School Type.



Source: Author's calculations based upon SIMCE tests (Chilean Ministry of Education 2007).

With these results in mind, Friedman's hypothesis that free choice and competition will reduce the educational gap between students does not seem to apply in the Chilean case. The positive contribution of private-voucher schools would not be totally problematic if the poorest students attended these schools because voucher schools could then be said to bring them the opportunity to access high-performing schools. Thus, the poorest students would have options that they did not have in the old system (before 1981). But what kinds of students are attending private-voucher schools? According to Figure 2, students attending voucher schools were concentrated in seventh, eighth, and ninth income deciles in the 1990s. However, during the period from 2002 to 2005 (see Figure 6), public schools enroll students from low and medium socio-economic status, private-vouchers enroll students from medium and medium-high socio-economic status, and private-paid enroll students from high socio-economic status. In conclusion, private-voucher schools not only contribute positively to national inequality, but they are also focalized in the medium and medium-high class.

Figure 6: Socioeconomic Status of Students Attending Different School Types.



Source: Author's calculations based upon SIMCE test scores (Chilean Ministry of Education 2007).

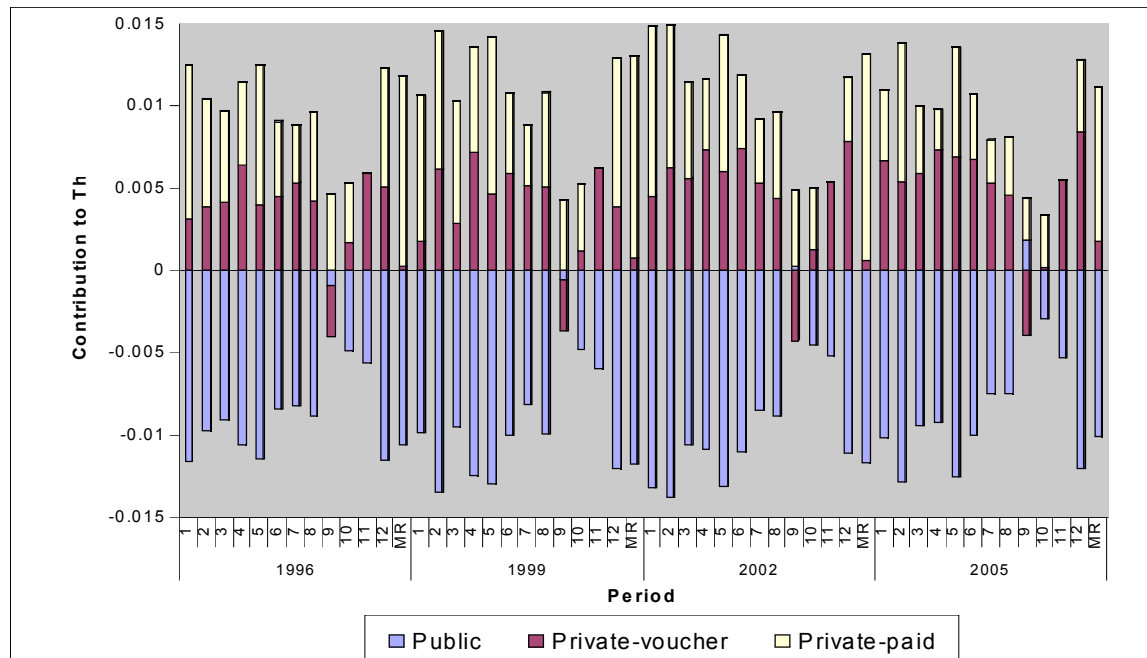
There is a simple explanation for these differences. When the privatization reforms were implemented during the military regime, the private-voucher schools were created and regulated using free market rules. Therefore, private-voucher schools received the government vouchers but also had the freedom to increase tuition cost according to their own priorities. Thus, the majority of voucher schools increased their tuition, and the parents from medium and medium-high classes were able to pay the additional money required, whereas the poorest parents did not have this choice. Hence, first, the poorest students continued to attend public schools and private-vouchers that did not increase their tuition. Second, private-vouchers that increased their tuition are attended by medium and medium-high class students, thus reproducing the social capital of this SES group (medium- and high-performing). Third, private-paid schools continued educating the elite. Therefore, the privatization reform permits the increasing segmentation of the Chilean education system according to the families' socio-economic status and reproduces the achievement of these social classes (low-, medium- and high-performing) that are analyzed in the next section.

How can we understand the reduced contribution of public and private-paid schools to educational inequality and the increasingly positive contribution of private-vouchers between 2002 and 2005? Since the nineties (the democratic governments), Chile has experienced systematic economic growth. For example, real GDP increased from US\$ 5,948 in 1990 to US\$ 15,160 in 2004 (Center for International Comparisons at the University of Pennsylvania 2007). Higher GDP has impacted poverty rates in the democratic period: 38.6 percent lived in poverty in 1990, and less than half of that number, 18.8 percent, lived in poverty in 2003 (Ministry of Planning 2003).

In general terms, during the democratic period, the poor population was significantly reduced. Therefore, more people moved into medium-low, medium, and medium-high classes in Chile. My argument is that the medium and medium-high classes are bigger now than in the past (the amount of families in this socioeconomic class) and that this has had an impact because more families can pay the additional percentage of tuition at private-voucher schools. Moreover, the medium-high class has preferred to send their children to private-vouchers because the tuition of private-paid schools has been increasing as well during the economic boom. For example, in 2002, 30 percent of all students from the medium-high group attended private-vouchers, but in 2005, that rate has risen to 40.5 percent, with an additional 2.2 percent of the students from the richest group (see Figure 6). On the other hand, public schools experienced reduced number of students from low and medium-low levels between 2002 and 2005. For example, the percentage of students from low SES was 14.3 percent in 2002 and 9.7 percent in 2005, and the students from medium-low SES decreased from 49 percent in 2002 to 46.7 percent in 2005. Thus, public schools reduced the percentage of students from lower SES, increased their performance on the SIMCE test and reduced their negative contribution to national inequality. On the other hand, the private-voucher schools increased the percentage of students from medium and medium-high SES, improved their performance on SIMCE scores, and positively contributed to national inequality as well.

Additionally, if we analyze the school's SES by regions, we can see that private-vouchers and private-paid schools have a systematically positive contribution to Theil in all regions and in all time periods. However, there is one exception: the ninth region, which is the poorest in Chile and has the highest indigenous population. In this region, private-vouchers have shown persistent negative contribution to Theil from 1996 and 2005, whereas from 2002 to 2005, public schools actually positively contributed to Theil.

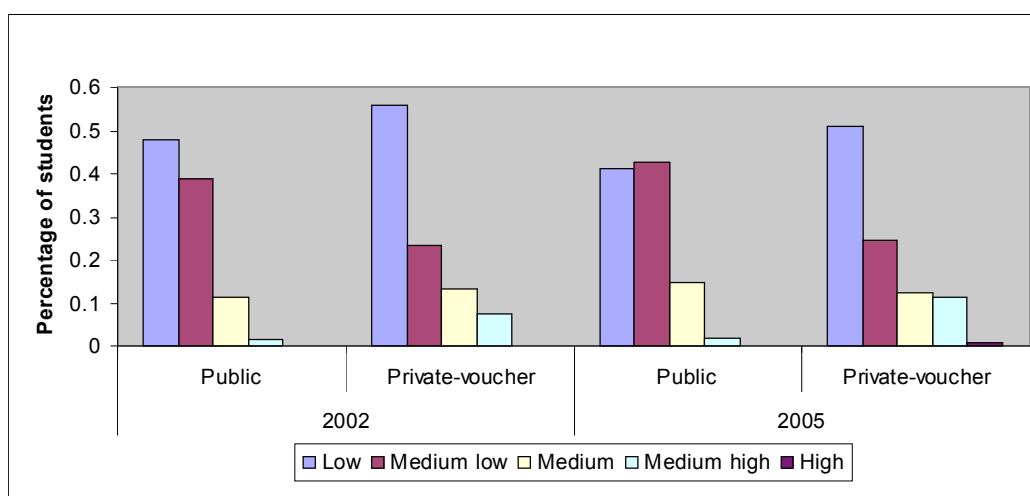
Figure 7: Theil by School Type and Region.



Source: Author's calculations based upon the SIMCE test (Chilean Ministry of Education 2007).

This is interesting because one of the arguments for implementing privatization reform in Chile was that private-vouchers would give educational opportunities to the poorest students, but in the poorest region with the poorest students, the private system does not work either. Why? My hypothesis is that, while in other regions the middle class has taken advantage of the Chilean economic boom, in the ninth region, the income level continues to be low, almost at the same levels as before the boom. Therefore, voucher schools that increased their tuition are not available to most students because the majority of families cannot pay the additional amount, which seems to prove that the private-voucher strategy only works if families have additional money to pay the extra tuition at the best private-vouchers. As a result, the bad outcomes (scores) previously common at public schools were transferred to private-vouchers in Region 9. In fact, in 2005, 51 percent of the poorest students attended private-vouchers, and only 41 percent attended public schools.

Figure 8: Socioeconomic Status of Students Attending Different School Types in the Ninth Region

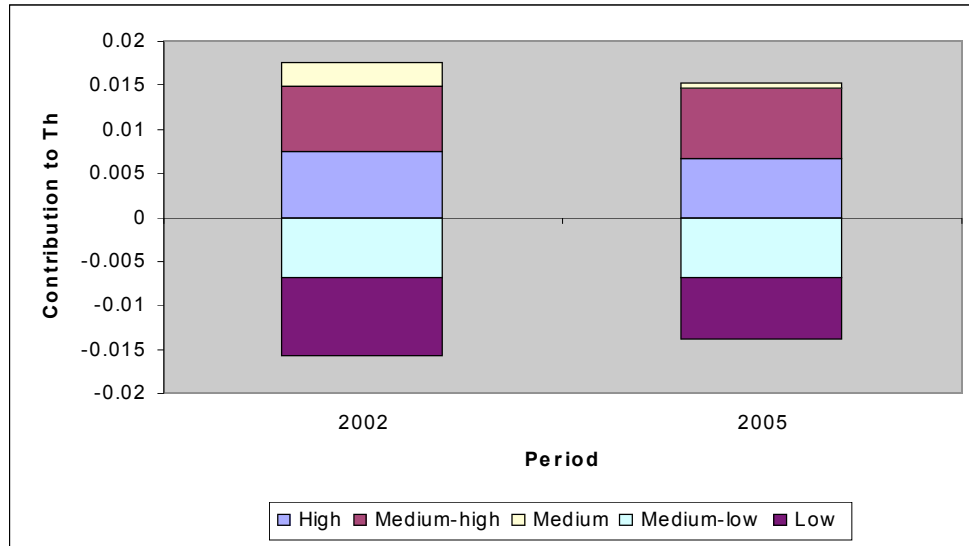


Source: Author's calculations based upon the SIMCE test (Chilean Ministry of Education 2007).

c) Contribution to Theil by school's socio-economic level.

This section evaluates the changes in educational inequality in Chile from 2002 to 2005. The “between groups” component of Theil's T-Statistic is used to calculate the contribution of SES of school to overall educational inequality. Figure 9 shows that the low and medium-low levels contribute negatively to national inequality, and the medium, medium-high, and high levels contribute positively. Furthermore, the low level reduces its negative contribution in 2005, just as the high and medium levels reduce their positive contribution in the same period. However, the medium-high level increases its positive contribution to national inequality

Figure 9: Contribution to Theil by school's SES.



Source: Author's calculations based upon SIMCE test scores (Chilean Ministry of Education 2007).

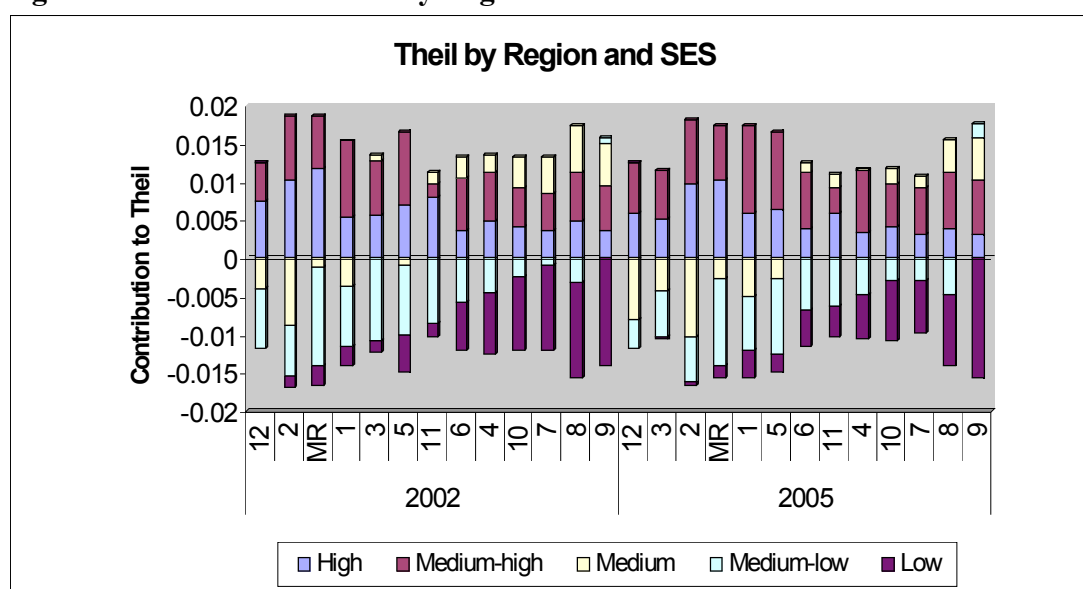
In the context of the Chilean economic boom, this is fully understandable keeping in mind that the majority of students from medium and medium-high classes attended private-voucher schools. During the Chilean economic boom, the percentage of students from the medium-high class increased in private-voucher schools during 2005 (this type of school increased their positive contribution to national inequality from 1996 to 2005). For example, the percentage of students from the medium-high class in private-voucher schools was 30 percent in 2002, and the proportion increased to 40.1 percent in 2005. Furthermore, the percentage of private-voucher school students from medium SES decreased between 2002 and 2005. In fact, the percentage of students in this group changed from 50 percent during 2002 to 42 percent in 2005 because some of this group increased their income and thus moved into the medium-high class.

On the other hand, the majority of students from low and medium-low classes studied in public schools. Therefore, the public school decreased the percentage of the student from low class from 14.3 percent in 2002 to 9.7 in 2005. Moreover, the proportion of students from the medium-low class decreased from 49 percent in 2002 to 46.7 percent in 2005. In brief, the

proportion of the poorest students has decreased overall, and the performance of public schools has increased as well because, like the Ministry of Education argues, the income of families has a direct impact on the performance of students.

Finally, Figure 10 shows us the link between region and SES of families. In general terms, the high and medium-high socioeconomic levels make positive contributions to regional inequality. The medium group has different behavior than the other groups: on the one hand, it contributes negatively to regional educational inequality in the richer regions (twelfth, second, metropolitan, first, third, and fifth); and, on the other had, it contributes positively to regional educational inequality in the poorer regions (localized in the South).

Figure 10: Theil's T-Statistic by Region and SES



Source: Author's calculations based upon SIMCE test scores (Chilean Ministry of Education 2007).

Finally, in all regions, the low and medium-low socioeconomic statuses make negative contribution to regional inequality, with the one exception of the ninth region. In this region, the medium-low class positively contributes to regional inequality. This finding can be explained because the majority of this group (42 percent in 2005) is educated in the public system, which obtained higher SIMCE scores than private-vouchers.

Conclusions.

The main argument for the implementation of voucher systems in Chile was that private-voucher schools could end the state monopoly of education, and thus, the following introduction of free competition and free choice would make possible the reduction of educational inequality between students and especially create greater educational opportunity for the poorest students. However, this paper shows that in the Chilean case, private-voucher schools have not only not reduced educational inequality, but also that they have increased segmentation of the educational system according to SES of students. Thus, the low and medium-low classes attend public schools, medium and medium-high classes study in private-vouchers, and the elite are educated in private-paid schools. The main explanation for this segmentation is that according to the free market reforms implemented during the eighties in Chile, private-schools can decide to increase their tuition according to their own interests and priorities. Therefore, vouchers only cover a certain percentage of the tuition, and parents need to pay extra money to register their children in these schools. Parents from medium and medium-high classes were able to pay the additional money required, whereas the poorest parents did not have this choice. Thus, the privatization reform has most benefited medium and medium-high classes. This is the opposite of what the military regime argued would happen if the system were put into place.

Several lessons can be drawn from the Chilean case. First, the educational financing system (voucher) needs to distinguish between different kinds of students; for example, the poorest ones need to receive more money (in the form of vouchers) from the state than middle class students. The main objective would be to offer an incentive for high-performing schools to accept and enroll low-income students because they will then obtain more money per pupil. Second, it is necessary not only to pay more for each poor student but also to create a quota

system in which private schools must admit and enroll a set percentage of poor students in order to avoid segmentation of the education system, as has occurred in Chile. Finally, it is necessary to add a strong accountability system where both private and public schools are responsible for student outcomes.

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