Uneven Distribution of Novice Teachers in the Chilean Primary School System

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Abstract: This study examines the allocation of novice primary teachers in Chilean schools, looking at their characteristics and at the attributes of the schools at which they are hired after having completed their initial teacher training. The study reveals that in Chile, more qualified novice teachers are more prone to get jobs in socio-economically advantaged schools or in schools with better academic outcomes. In contrast, in disadvantaged schools, it is more likely to find novice teachers with poor results on their exit exams and who come from socioeconomic backgrounds similar to those of the school populations. These findings provide new data to inform Chilean policies. Hence, achieving a more equitable distribution of highly qualified teachers is a challenge for Chile if the aim is to reduce the achievement gap between schools attended by pupils of higher and lower socioeconomic status. Furthermore, these findings might shed some light on the current debate surrounding teacher education policies. A new law will mandate that novice teachers pass the exit exam that until now they have taken voluntarily in order to be hired in any publicly funded school. This study provides support and evidence to inform the debate that will follow in parliament, since we found that novice teachers performing at a very low level—perhaps below the minimum that will be required—have a high probability of ending up working in schools in more

disadvantaged areas. On a more general scale, this research also provides a simple but complete methodology that can be used to study issues of teacher distribution elsewhere.
Keywords: teacher market; teacher policy; teacher placement, initial teacher training; primary schools; stratification; segmentation; Chile.

Distribución inequitativa de profesores novicios en el sistema escolar chileno
Resumen: Este estudio examina la distribución de profesores de primaria recién graduados en las escuelas chilenas, considerando tanto sus características como los atributos de las escuelas en las que han sido contratados después de haber completado su formación inicial. El estudio revela que en Chile, los profesores novicios más calificados son más propensos a conseguir trabajo en escuelas socio-económicamente aventajadas o en las escuelas con mejores resultados académicos. En cambio, en las escuelas cuyos alumnos provienen de estratos socioeconómicos más bajos, es más probable encontrar profesores novicios con pobres resultados en sus exámenes finales y que provienen de entornos socioeconómicos similares a los de las poblaciones escolares. Estos hallazgos aportan nuevos datos para informar las políticas chilenas. El logro de una distribución más equitativa de los maestros altamente calificados es un desafío para Chile si el objetivo es reducir la brecha en el rendimiento entre las escuelas que asisten alumnos de estatus socioeconómico alto y bajo. Además, estos hallazgos podrían arrojar algo de luz sobre el debate actual en torno a las políticas de formación del profesorado. Una nueva ley presentada por el gobierno, mandata que los profesores novicios deben aprobar el examen de egreso de su formación inicial, que hasta ahora ha sido voluntario, para que se autorice su contratación en escuelas que reciben financiamiento público. Este estudio proporciona evidencia y apoyo para informar el debate que seguirá en el Parlamento, ya que se encontró que los profesores novicios con bajos niveles de desempeño en su examen final tienen una alta probabilidad de acabar trabajando en las escuelas de zonas más desfavorecidas. En una escala más general, esta investigación también proporciona un método sencillo, pero completo, que se puede utilizar para estudiar el mercado laboral de docentes y la distribución de profesores en los sistemas escolares en otros países.
Palabras clave: mercado laboral de profesores; políticas docentes; distribución de profesores; formación inicial docente; escuelas primarias; estratificación; segmentación; Chile.

Alocação desigual de professores primários iniciantes nas escolas chilenas
Este estudo examina a alocação de professores primários iniciantes nas escolas chilenas, depois de concluir sua formação universitária como professor. O estudo revela que no Chile, os professores iniciantes mais qualificados são mais propensos a conseguir emprego em escolas sócio-economicamente favorecidas ou em escolas com melhores resultados académicos. Em contraste, nas escolas desfavorecidas, é mais provável encontrar professores principiantes com maus resultados em suas provas finais e que vieram de contextos socioeconômicos semelhantes aos das populações escolares. Estes resultados fornecem nova informação para as discussões e decisões políticas chilenas. Portanto, alcançar uma distribuição mais equitativa de professores altamente qualificados é um desafio para o Chile, principalmente considerando se o objetivo é a redução da diferença do desempenho escolar entre as escolas frequentadas por alunos de maior e menor nível socioeconômico. Além disso, esses resultados podem trazer alguma luz sobre o debate atual em torno das políticas de formação de professores. A nova lei exige que os professores iniciantes passem em uma prova depois de formados para obter autorização para trabalhar em uma escola pública. Este estudo fornece evidências para apoiar e informar o debate que continuará no Parlamento baseando nestes resultados no qual os professores iniciantes abaixo do desempenho mínimo têm uma elevada probabilidade de acabar trabalhando em escolas das áreas desfavorecidas.

Numa escala mais geral, esta investigação também fornece uma metodologia simples, mais completa, que pode ser usada para estudar os problemas da distribuição de professor em outros lugares.
Palavras-chave: mercado de professor; política professor; colocação de professores, a formação inicial de professores; escolas primárias; estratificação; segmentação; Chile.

Introduction[1]

Recent policies in Chile have focused on teachers and initial teacher training, moving from a free market scenario with no public regulation of institutions and programs to policies that have increased public influence on tertiary education (Cox, Meckes, & Bascopé, 2010). Hence, several measures have been taken: a scholarship has been established for candidates with high entrance scores who apply to initial teacher training, accreditation of initial teacher training programs became compulsory in 2006, a national exit exam has been put in place, and very recently, the government has proposed a new law establishing that passing this exam will be mandatory for any novice teacher who wishes to be hired by schools that receive public funding. At the same time, a complementary law that establishes a salary increase for teaching graduates who perform at the top 30% on this exam is being discussed in the Chilean Parliament. However, the distribution of these novice teachers and the need for specific incentives to attract them to schools with socially disadvantaged students has not been a matter that has drawn much attention.

So far, in Chile research in this area is very scarce, and consequently, this debate has not been based on empirical evidence. This paper represents a first step towards a clearer understanding of these issues in this country. It analyzes the distribution of elementary school teachers hired 18 months after their graduation in different subsidized schools throughout the country. The goal of this study was to observe if the allocation of these new teachers varied according to their characteristics and those of the schools at which they were hired, or if novice teachers were uniformly distributed in state-subsidized schools, regardless of their individual qualities and qualifications.[2] In particular, our interest was to study the distribution of novice teachers according to the qualifications they obtained in their exit exams, hence, equity in the distribution of well prepared teachers.

This paper offers the first descriptive approach to the topic in Chile, and the information produced may inform policies aimed at reducing inequalities in pupils' access to quality education in this country from a different perspective, namely the equity in opportunities to have access to qualified teachers. Equity in access to quality education has been an issue that over the last few years has triggered massive student riots in Chile. Secondary school students led the first of these revolts in 2006, while university students headed the second in 2011. In 2006, students demanded an end to for-profit schools, to inequality in education, and a more active role of the state in protecting and fostering public education. As a consequence of the first riot, the president appointed a multidisciplinary advisory committee to discuss the problem. The students demands gained widespread public support, and many of the recommendations included in the final report of this Committee (Consejo Asesor Presidencial para la Calidad de la Educación, 2006) were taken into account and motivated the implementation of new policies. However, the political response fell

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[1] This study was funded by CIE 01 Conicyt, Chile.
[2] While the subsidized sector does not cover the entire universe of primary educational enrollment, it does cover a large majority (93%). It is worth noting that it is not possible to generalize our findings to the non-subsidized private sector (which represents 7% of school enrollment). It is the interest of the authors to focus on this sector because the policies now being discussed in the parliament affect only these schools, while the private non-subsidized sector is left unregulated.

short of the demands and did not respond to all of them. (Bellei & Valenzuela, 2010; García-Huidobro, 2011; Gerter & Ramos, 2008). Consequently, the social unrest persisted prompting a new massive student riot in 2011 insisting in the demand for equity in the access to quality education.

Recent studies have shown that there is less mobility and less retirement among teachers in the most disadvantaged schools, and that in the few cases where teachers leave these schools, it is more likely that they will move to schools of the same administration type and with similar socioeconomic conditions (Cabezas, Gallegos, Santelices, & Zarhi, 2011; Valenzuela & Sevilla, 2012). These findings confirm the need for studies on the patterns of novice teachers' first job placements; if novice teachers with poor initial qualifications tend to begin their working careers in the most disadvantaged schools—where highly qualified teachers would be most needed—it is very likely that they will either stay at these same schools or move to similar (disadvantaged) schools. Therefore, a study describing first-job allocation in state-subsidized schools in Chile was imperative, especially now that after years of an extremely unregulated initial teacher training system, two relevant laws are being discussed in parliament. One proposes that the national exit exam of teacher graduates—which until now has been voluntary—should become mandatory, and must be passed in order to be hired in any state-subsidized school. It further establishes that the results obtained by each initial teacher training institution must be published. The other law institutes a salary incentive to retain novice teachers who perform within the top 30% in the exit exam and enter a state-subsidized school. Thus, obtaining data about the current allocation of these high performing teacher graduates during their first years of work is crucial if we are to have enough information about what kind of schools will benefit from this measure.

Methodologically, this research relies on multivariate empirical models that combine novice teachers' characteristics as independent variables and different classifications of the schools at which they were hired 18 months after graduation as dependent variables. In brief, these models identify the most relevant characteristics of novice teachers in relation to different attributes of the schools where they were hired.

This study also contributes to the international evidence regarding first-job allocation in the teacher market, using simple quantitative models, which had not yet been used in this area of research, to describe the distribution of newly graduated teachers in the Chilean subsidized educational system. It is worth noting that the methodology specified does not seek causality or the determinants of teacher allocation, but rather gives a fully detailed picture of first-job recruitment in different types of schools in the subsidized primary teacher market.

The paper proceeds as follows: the first section reviews national and international literature regarding recruitment, job placement, and retention of teachers. In what follows, a brief description of the Chilean educational system is presented, including an evaluation of the current status of initial teacher training programs, as well as a description of the Chilean primary school system. The next two sections describe the empirical models used, the estimations calculated and the data and variables considered. Finally, the paper presents the main research results and the conclusions, along with some of the policy implications of the study.

Teacher Hiring and Distribution in the Educational System: Evidence from Chilean and International Research

It is logical to think that a teacher ought to know what he or she is going to teach in order to do so effectively. Unfortunately, international evidence is not clear about how much content knowledge teachers need to master, nor do we know the most relevant issues that make teachers

more effective (Cochran-Smith, 2001; National Research Council, 2010; Wilson & Floden, 2003; Wilson, Floden, & Ferrini-Mundy, 2001) . However, there is important evidence about the positive relationship between teachers' subject knowledge and their students' learning outcomes. There is empirical support in Chile (Bravo, Falck, González, Manzi, & Peirano, 2008; León, Manzi, & Paredes, 2009) and internationally (Monk, 1994; Hanushek & Rivkin, 2004; Kukla-Acevedo, 2009) for this claim. Consequently, if we consider the impact on students' learning, the distribution of well-prepared teachers within an educational system is crucial in the examination of issues of equity in access to quality education.

In the US, the distribution of highly qualified teachers has become a contentious issue due to the No Child Left Behind Act (NCLB) and its provisions, which state that all teachers in core academic areas must be highly qualified according to state requirements. Several studies have looked at how teachers with different characteristics and qualifications were distributed across districts, states, and even nationwide (Betts, Rueben, & Danenberg, 2000; Clotfelter, Ladd, & Vigdor, 2006; DeAngelis, Presley, & White, 2005; Lankford, Loeb, & Wyckoff, 2002; Lu, Shen, & Poppink, 2007; Owen, 1972; Wayne, 2002). In general, results show that advantaged schools, in terms of pupils' academic performance and socioeconomic conditions, tend to employ more highly qualified teachers than disadvantaged schools. The qualification of teachers has been measured in various ways, including scores on certification exams, credentials, or experience. For example, research has shown that less qualified teachers (i.e., those who failed their certification exams) tend to work in schools with higher concentrations of minority, low-income, and low-performing students (Boyd, Lankford, Loeb, & Wyckoff, 2004; Lankford et al., 2002).

Other studies have attempted to measure the consequences of NCLB by looking at the proportion of highly qualified teachers before and after the act, and these have found a reduction in the inequality of the distribution of highly qualified teachers (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2008; DeAngelis, White, & Presley, 2010). Even so, the impact of such policies on student achievement is still a subject of debate (Hanushek & Rivkin, 2010); according to the abovementioned studies, NCLB has clearly increased equality in the distribution of teacher knowledge.

The factors that may affect teacher hiring and distribution in different schools have been thoroughly studied. Economists have proposed a model of hedonic prices (Antos & Rosen, 1975), which assumes that teachers have specific preferences for salary and working conditions, whereas employers differentiate based on the salary they can offer and on their preferences for specific teacher attributes. Bacolod (2007), who conducted research in Georgia, USA, showed that working conditions were more important than salaries for novice teachers when they chose where to work. In addition, there have been studies on how the characteristics of schools (e.g., infrastructure, access to opportunities for professional development) determine the retention or turnover of a group of teachers after they are hired (Loeb et al., 2005; Stinebrickner, 1998). Likewise, Boyd, Lankford, Loeb, and Wyckoff (2006) proposed a model in which the geographical position of the school in relation to the teacher's residence has an impact, since teachers prefer schools located close to their homes.

Since in this study we are not seeking the causes of teacher first-job recruitment in Chile, we considered all the available information about schools and all characteristics of new graduates. In the following section, the importance of examining the factors considered will become clear, based on recent evidence about teacher recruitment, mobility, and retirement in the Chilean context.

Recruitment, Mobility, and Retirement of Teachers in Chile

Recruitment and mobility in the teacher market is a phenomenon that has been studied in Chile only recently. Two recent studies consider this issue: Cabezas, Gallego, Santelices, and Zarhi

(2011) and Valenzuela and Sevilla (2012). We cite these studies here because their findings highlight the relevance of our own research question, which focuses on the first job of novice teachers. Cabezas et al. (2011) based their study on a 2005–2009 longitudinal teacher survey and found that, in general, when a teacher moves to another school, he or she is more likely to move to a school of the same socioeconomic level or administration type, while only a very small proportion of teacher mobility occurs between schools of different administration types or socioeconomic levels. In a complementary study based on data from a large panel of teachers between 1999 and 2009, Valenzuela and Sevilla (2012) found less mobility and retirement in public, socioeconomically disadvantaged and in low-performing schools. In other words, teachers who enter these types of schools are less likely to leave the first school they chose. The limited mobility observed makes the study of first-job placement patterns even more important.

Regarding the first placement of novice teachers in Chile, a handful of studies have shed light on teachers' job placement according to the initial teacher training programs in which they studied and the type of initial teacher training they received. Ruffinelli and Guerrero (2009) identified consistent associations between the initial teacher training institution and the subsequent place of employment.[3] Most novice teachers were hired by schools of the same administration type (public or private subsidized) as the secondary schools from which they had graduated. Likewise, this study showed that most novice teachers who work in the public sector came from universities with little or no selectivity. The authors believ that this reproduces the social stratification and the academic achievement gap within the Chilean educational system, since new teachers tend to work in schools serving a student population in a setting similar to that of their own educational backgrounds. On the other hand, Ortúzar, Flores, Milesi, and Cox (2009) found that teachers with weaker initial training (long-distance studies or classes held on weekends or over vacation periods) had a higher probability of working in economically and academically disadvantaged schools, as measured by SIMCE, the Chilean national school test. These studies have focused on the association between novice teachers' placement and the institutions at which they studied or the type of programs they attended. However, the impact of their level of preparedness in terms of subject knowledge, as measured by their exit exams, on their first job placement had not been examined before this study.

In this light, this study is meant to move beyond what has already been empirically researched in Chile (Ruffinelli, 2009; Ortúzar, 2009) by analyzing the effects of the characteristics of novice teachers on their placement within the school system. Based on multivariate models, the present study provides a descriptive view of some of the most salient attributes of new teachers who are hired in different Chilean schools. It is descriptive, since it does not go into great detail regarding the specific school-related factors that could cause a concentration of certain types of teachers; rather, it describes the main characteristics of new graduates who start working in different types of schools, while also considering the fact that teacher mobility and retirement is different in different kinds of schools.

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[3] This article synthesizes the findings of a study that is discussed in detail in Ruffinelli (2009).

The Chilean Context

Description of the Primary School System

In 1981, Chile introduced a nationwide voucher program for primary and secondary schools. Within the context of open school choice, the amount of this voucher attached to each student varies according to his or her socioeconomic background. Except for vulnerable students, this government subsidy may be supplemented by a family contribution, in the case of private subsidized schools that have this requirement.

In Chile, there are three different types of school, based on their financing mechanisms and administration: "public schools," managed by the municipalities, which receive a government subsidy through a voucher and constitute 46% of primary school enrollment in Chile; "government-subsidized private schools" which constitute 47% of primary school enrollment in Chile; and "private paid schools," which do not receive government subsidies and educate 7% of the nation's primary schools students.[4] Hence, the sector that receives government subsidies (public and private-subsidized) covers 93% of national enrollment. This study is focused on the government-subsidized sector only, not just because it is larger, but also because it is the sector that will be regulated by law regarding the recruitment of newly graduate teachers.

Information from two data sets regarding school performance is considered in this study. On the one hand, Schools' results on the Sistema Nacional de Evaluación de la Calidad de la Educación (National Assessment of Students' Learning Outcomes, SIMCE). SIMCE is the national census-based test taken by nearly all students, that measures learning achievement in language arts, mathematics, social studies, and science in the 4th, 8th, and 10th grades, based on the national curriculum. Along with the tests, students, teachers, and parents are surveyed to collect information regarding the socio-demographic characteristics of the students and the schools. Thus, there are data about each school in the country regarding the students' socioeconomic backgrounds and their performance in national tests. On the other hand, the indicators of the Sistema Nacional de Evaluación del Desempeño (National System of School Performance Evaluation, SNED) were also considered. These indicators were calculated for all subsidized schools in order to identify those that would be accredited for an award that consists of a salary increase for the teaching staff of the schools in the top 25%. Schools are evaluated according to six dimensions, as measured by the Ministry of Education:

1) effectiveness of the school, measured by the learning outcomes of enrolled students;
2) school improvement, indicated by the difference between scores at two different moments;
3) school initiative, meaning the involvement of the school in projects of innovation in education and in the school's relations with other external institutions;
4) improvement of working conditions and appropriate school management, as reported by the national inspection system;
5) equal opportunities for students, which are related to access, the retention of the school population, and the integration of those with learning difficulties; and
6) the integration and participation of teachers and parents in the development of the school's educational agenda.

The monetary award is given to the group of better-evaluated schools in each of the homogeneous clusters of schools, which consider their socioeconomic characteristics and

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[4] Data obtained from the Department of Research and Development of the Ministry of Education, retrieved from http://w3app.mineduc.cl/DedPublico/Inicio

geographic location.[5] Together, the SIMCE and SNED data sets provide information that allows us to characterize the schools in the subsidized sector and to relate these schools' characteristics to those of new teachers who were recruited by them during 2010.

The monetary award is given after a comparison of schools that are homogeneous in terms of their geographic location and their socioeconomic characteristics.

Initial Teacher Training in Chile

In the 1980s, Chile stimulated the participation of private institutions in tertiary education, and a large number of new institutions and programs were established. Subsequently, traditional universities were joined by many new private universities and institutes of higher education. Currently, Chilean higher education is mainly financed with private funds; in fact, 85% of higher education spending comes from students and their families, the highest proportion of all OECD countries.[6]

The increase in enrollment and in the number of programs in the first decade of the 21st century surpassed the prior decade, and the growth of initial teacher training programs was particularly striking when compared to that of other degree programs.[7] The sharp increase in initial teacher training programs of primary teachers between 2000 and 2008 was mainly due to an increase in enrollment and in the number of programs in the private sector. Table 1 shows that total enrollment in these private universities grew by 812%, and the number of programs offered grew by 735%, a rate that is clearly ahead of the growth observed in traditional universities.

This explosive growth was at the expense of the academic selectivity of students. Every year, Chile administers a national university entrance exam (PSU) as part of the application process for institutions of higher education. However, it is not mandatory to use this test as a requirement for admissions; in fact, universities with lower entrance standards may not require it. Universities that educate primary teachers can be classified according to their degree of selectivity of the applicants, based on the average PSU scores of their student bodies.[8] If we divide institutions according to those that admit students with an initial score of 550 or above on average and those that admit students with scores below 550,[9] we see that the growth in enrollment, as well as in the number of programs that prepare teachers, was higher in less selective institutions, as shown in Table 1. For example, in 2000, 43% of graduates came from selective universities, whereas in 2008, only 23% of graduates had studied at selective universities.

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[5] For more information about this evaluation, see the online SNED document available on the Ministry of Education website: http://www.mineduc.cl/usuarios/sned/doc/201108031652330.Documento_SNED.pdf
[6] This is according to 2010 data gathered by the Organization for Economic Cooperation and Development (OECD, 2010).
[7] For more information regarding higher education in Chile, see Brunner and Uribe (2007); and for specific information about teacher formation programs, see Avalos (2003).
[8] An index was created, taking into account the average scores of those who entered the teaching degree program in three different years (2005, 2007, 2008), so as to avoid bias due to short-term variability in the scores. We corroborated that the universities without PSU information in the database were those without test scores as an entrance requirement. In those cases, the selectivity index was 0.
[9] PSU scores over 550 points represent approximately the top 30% of national PSU scores; a panel of experts (Panel de expertos para una educación de calidad, 2010) determined this as the criterion for a quality school. This criterion is sufficiently selective in the case of Chile. Barber and Mourshed (2007) showed that in countries with the highest educational results, students applying for teaching degree programs come from the top 5% of high school graduates (as in Korea) to the top 30% (as in Singapore and Hong Kong).

Table 1
Growth of the Supply of Initial Training Programs for Primary Teachers from 2000 to 2008

	Traditional universities (CRUCH)	Private universities	Professional institutes	Selective institutions	Non-selective institutions	Total
Graduates						
2000	485	34	85	246	358	604
2008	2,180	1,662	284	965	3,161	4126
Variation %	349.5	4,788.2	234.1	292.3	783	583.1
1st-year enrollment						
2000	876	453	531	417	1,443	1,860
2008	1,366	3,206	1,022	874	4,720	5,594
Variation %	55.9	607.7	92.5	109.6	227.1	200.8
Total enrolled						
2000	3278	1,259	1,335	1,870	4,002	5,872
2008	8,994	11,490	2,540	3,541	19,483	23,024
Variation %	174.4	812.6	90.3	89.4	386.8	292.1
Number of Programs						
2000	19	14	11	10	34	44
2008	42	117	18	16	161	177
Variation %	121.1	735.7	63.6	60	373.5	302.3

Source: Consejo Nacional de Educación (CNEd), INDICES database.

Chile began to administer INICIA (in English, START), a voluntary exit exam for students who were graduating from primary school teaching degree programs. In 2008 and 2009, the exam assessed graduates' subject knowledge in the disciplines that they would teach, as well as general abilities, such as writing and their use of information and communication technologies. In 2008 and 2009, 40 and 41 institutions, respectively, registered their graduates to take this exam. This represents approximately 80% of the institutions that offer primary education degrees, and almost 80% of the students graduating from those degree programs were able to choose whether to take this test or not. The test measures general and specific subject knowledge in the areas of language arts, mathematics, science, and social studies. They also have to complete a questionnaire, which collects information regarding their socio-demographic characteristics. This exam has provided an assessment of the knowledge and general skills of recent teacher graduates.[10] Chilean authorities have presented a law to parliament establishing that passing this test will be mandatory for any teacher who applies to a position in a subsidized school. Furthermore, a complementary law establishes a higher salary for graduates who perform at the top 30% in the test when they start working.

Methodology

In this section, we present the econometric models used to estimate which characteristics among novice primary teachers are most strongly correlated with different types of subsidized

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[10]For more information regarding this evaluation, see Manzi (2010).

schools at which they have jobs18 months after graduating from the initial teacher training program. The process of getting a job in a specific kind of school is a complex phenomenon that depends on decisions that cannot be examined in isolation. On the one hand, it is important to consider the novice teachers' choice of school where they will seek employment. This decision depends on the characteristics of the school and its students, as well as on the working conditions it offers. On the other hand, the school's decision also needs to be taken into account. The school must choose the most suitable teachers for the institution among those who apply for the job. Schools cannot always choose teachers with the profile they would prefer, and graduates cannot always choose their ideal school. Restrictions regarding working conditions provided by schools come into play, as do the skills and qualities that the teacher is able to offer to the school.[11]

The goal of the proposed methodology is to uncover the characteristics of novice teachers' backgrounds that are most relevant to getting a job in specific types of schools. Since this analysis is descriptive in its aim, causal relationships regarding primary teachers' first-job decisions will not be addressed here. Though we might have omitted some factors that could be important in determining the first-job placement of new graduates, the estimations we present are able to show the relationship between important characteristics of new teachers and the schools at which they end up working.

All linear and nonlinear estimations proposed assume that the decisions of novice teachers, as well as those of schools, will be influenced by graduates' characteristics and by the characteristics of the institutions where they studied. Formally, we can state that the characteristics of school j where graduate i starts working (SC $_{ij}$) will be related with a vector of the graduate's characteristics (g $_i$) and a vector with characteristics of the institution from which that individual graduated (u $_i$), where F (.) could be either a linear or nonlinear function:

$$SC_{ij} = F(g_i, u_i)$$

Twelve categories were used to represent the type of school, symbolized by sub index j. We utilized the socioeconomic classification of schools used by the SIMCE assessment to report 2007 test results,[12] the scores obtained by each school in the national tests assessing the language arts and mathematics performance of 8th graders,[13] a classification of the schools according to their administration type (public/private subsidized), and the battery of indicators provided by the SNED evaluation for each school.

A logit model was used in the case of discrete variables that were used to describe schools (socioeconomic level, administration type, and if the school was granted the SNED award), and a linear regression model was used with continuous dependent variables, such as the school's average SIMCE test results and all of the six indicators considered by the SNED evaluation.

In the case of discrete dependent variables, nonlinear probability models were used to estimate the probability of getting a job in different kinds of schools. Logit models were used for the

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[11] For other methodological approaches to this phenomenon, see Ballou (1996) and Boyd et al. (2006).

[12] For information regarding the creation of socioeconomic indicators, see Metodología de construcción de grupos socioeconómicos en SIMCE 2007 8° Básico [Methodology for creation of socioeconomic groups in SIMCE 2007 8th grade], retrieved from http://www.simce.cl/fileadmin/Documentos_y_archivos_SIMCE/Documentos_tecnicos_investigadores/Metodologia_GSE_2007_8basico.pdf

[13] We use 8th graders' data because a lot of missing data was generated using 4th graders' scores, since there was not information available for all schools in the sample. This is not a big problem, since there is a high correlation between 4th- and 8th-grade scores in the schools. Furthermore, the SNED estimator of effectiveness combines information from both grades, and this is presented in the results as well.

binary outcome variables, and an ordered logit model was used for the variable that indicated the socioeconomic level of the school population, which had three possible outcomes. In the logit models, the results are expressed in Relative Risk Ratios (RRR), so coefficients larger than 1 indicate that an increase in the independent variable has a positive effect on the probability of success; likewise, coefficients lower than 1 indicate the contrary. In the case of ordered logit models, the coefficients calculated were directly displayed in the results, since the sign of the coefficient indicates the effect of the independent variable on the dependent variable.[14] To estimate the magnitude of effect, we present the estimated probabilities of getting a job in different types of schools for teachers with certain characteristics and then compare these probabilities between groups of teachers.

For continuous dependent variables, such as schools' average scores on the national exam SIMCE and all of the indicators included in the SNED evaluation, classic coefficients β were presented in a linear regression. Since the values of the independent variables are very different, the results were presented as changes in the corresponding dependent variable in response to changes of one standard deviation for the independent variables; then, we measured the magnitude of the impact expressed in standard deviations of the dependent variable of interest.

In summary, twelve equations were estimated, as shown in Table 2, using a set of the novice teachers' characteristics as independent variables, which are specified in the next section and summarized in Table 3.

The proposed estimations' aim was to detect if there are significant differences between the profiles of novice teachers who have been hired by different types of schools within the subsidized sector (public and private subsidized schools) eighteen months after having completed their initial university education.

Table 2
Summary of Estimations

Dependent variable	Type of variable	Model used
Hired by a subsidized school	Discrete	Logit (hired =1)
School's socioeconomic level	Discrete	Ordered logit (low=1, med.=2, high=3)
School's administrative type	Discrete	Logit (private school=1)
Selected for the SNED grant	Discrete	Logit (selected=1)
School's avg. language arts SIMCE score	Continuous	Linear regression
School's avg. math SIMCE score	Continuous	Linear regression
School Effectiveness	Continuous	Linear regression
School improvement	Continuous	Linear regression
Initiative of the school	Continuous	Linear regression
Improvement of work conditions	Continuous	Linear regression
Equal opportunities for pupils	Continuous	Linear regression
Integration and participation	Continuous	Linear regression

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[14] For more information about these models, see Cameron and Trivedi (2005, Chs. 14–15).

Data and Variables

The data used to conduct this study were divided into four groups: 1) description of initial teacher training programs in Chile; 2) description of subsidized primary schools; 3) description of novice teachers who graduated from primary teacher training programs in 2008; and 4) allocation of teachers in public and private subsidized schools.

The data sources are the following: 1) data from institutions and degree programs for the initial training of primary teachers (the INDICES databases, generated by the National Council of Education, known by the Spanish acronym CNED);[15] 2) results of the 2007 SIMCE test for 8th graders, with classification of schools throughout the country according to the socioeconomic level of their students and school administration type (SIMCE, 2007);[16] 3) scores obtained by graduates of initial teacher training programs in the subject knowledge test and socio-demographic information collected in the 2008 INICIA test; and 4) information regarding schools where novice teachers were hired in the public and private subsidized sectors. This information was obtained from a database managed by the Ministry of Education that identifies every teaching degree graduate working within the subsidized sector in Chile, including characteristics of every school, based on the SNED indicators.[17]

The sample of graduates analyzed (with complete information about their performance on the exit exam and data on their placement in schools within the subsidized sector) includes 1,927 cases, representing 48% of those graduating from their primary initial teacher training in the entire country in 2008.[18] The data for graduates who took the exit exam (INICIA) in 2008 were contrasted with data from teachers who were actually working in the subsidized sector in April 2010. Of those students that took the INICIA exam, 737 (38%) were working in the subsidized sector 18 months later, and 1,190 (62%) were not.

Tables 3 and 4 summarize the variables considered for estimations obtained from the abovementioned sources. Table 3 shows a series of characteristics of novice teachers that may be related with their placement in different types of schools: their knowledge of the disciplines that they will have to teach (as measured by the INICIA exit exam), their socioeconomic backgrounds (the educational level of their parents and the administration type of the school where the graduate studied), age, and gender. Table 3 also shows a set of characteristics of the teacher training programs where they studied: duration in semesters, total enrollment, whether it was a daytime or an evening program, and the selectivity of the initial teacher program they attended.[19] The table separates teachers who were working in the subsidized sector from those who were not.

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[15] Available at http://www.cned.cl/public/Secciones/SeccionIndicesEstadisticas/indices_estadisticas.aspx

[16] SIMCE indicators (test scores and socioeconomic level) are a proxy of the schools characteristics, these indicators can change from one year to another or be different for different levels. However, comparing with other years and levels, the results were not significantly different in most of the cases. Taking this into account, we preferred to use the 8th-graders' data as indicators for the school at which the newly graduates were hired a year before they graduated. Results and socioeconomic classification data are available at http://www.simce.cl/.

[17] It is worth noting that the tests and surveys used for this study include a written consent that permits the use of these data for academic research purposes or publication of aggregate data. The databases of teacher training institutions are census-based and include all primary teacher training centers and programs. The SIMCE test is also a census test taken by students at nearly every school in the country.

[18] This is according to data from INDICES 2008 of the Consejo Nacional de Educación (National Council of Education, CNED)

[19] The selectivity of the graduate's teaching program was considered to be an indicator of another set of characteristics, since in Chile selectivity is associated with prestige and years of experience of the teaching

As can be seen in Table 3, teachers who were working in the subsidized sector and those who were not present similar variations regarding INICIA test results and the selectiveness of the institutions at which they had studied. Most of the graduates who began working in the subsidized sector in April 2010 had studied in Private Subsidized (PS) schools, and 61% of these had parents with no postsecondary degrees.

Table 4 shows the descriptive statistics for the dependent variables. Here, we see a summary of the distribution of the entire sample of novice teachers hired by the different types of schools in the country. Thus, it shows descriptions of the schools that hired new graduates, classified according to their national test results, the socioeconomic background of their students, the school's administration type, and their characteristics as shown by the SNED indices.

Table 3
Characteristics of the Graduates and the Programs in Which They Study (Independent Variables)

	Graduates hired in the subsidized sector in April 2010 (N=737)				**Graduates out of the subsidized sector in April 2010 (N=1190)**			
Continuous	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
Score on INICIA test (% of correct answers)	0.46	0.14	0.05	0.87	0.46	0.15	0.08	0.98
Graduate's age	24.9	4.65	21	56	25.8	5.5	21	57
Selectivity of the university graduate attended	405.5	163.8	0	604.1	381.2	171.41	0	604.1
Duration of the training program (semesters)	8.71	0.82	8	10	8.8	0.8	8	10
Total enrollment of the training program	365.1	332.93	16	1654	350.3	302.2	16	1654
Discrete	**Freq.**	**%**	**Min**	**Max**	**Freq.**	**%**	**Min**	**Max**
Daytime or evening program								
Evening part time program	116	15.7	0	1	281	23.6	0	1
Full time diurnal program	621	84.3	0	1	909	76.4	0	1
Administration type of graduate's school of origin								
Public school of origin	321	43.5	0	1	572	48.1	0	1
Private subsidized school of origin	377	51.2	0	1	518	43.5	0	1
Private paid school of origin	39	5.3	0	1	100	8.4	0	1
Graduate's gender								
Female	635	86.2	0	1	1024	86.1	0	1
Male	102	13.8	0	1	166	13.9	0	1
Parents' education								
Parents with higher education	142	38.2	0	1	471	39.6	0	1
Parents without higher education	231	61.8	0	1	719	60.4	0	1

N=1927 (total observations)

programs. The selectivity index is derived from the average admission scores for those individuals who completed teaching programs for primary education and graduated in 2005, 2007, and 2008 (no data were available for 2006).

Table 4
Variables used to describe schools where graduates were hired

Dependent Variables

Continuous	Mean	Std. Dev.	Min	Max
School's avg. score on national SIMCE language arts test	258.7	24.3	181	317
School's avg. score on national SIMCE mathematics test	243.7	28.2	166	321
SNED school index	59.1	6.8	38.3	77.5
School effectiveness index	45.0	13.6	13.6	86.3
School improvement index	43.6	6.9	14.2	83.3
Initiative of the school index	74.5	25.1	0.00	100.0
Improvement of work conditions index	95.0	14.4	22.2	100.0
Equal opportunities index	68.4	24.9	0	100
Integration and participation index	93.1	3.8	72.3	98.9
Discrete	Freq.	%	Min	Max
Selected for the SNED award				
Not selected	485	65.8	0	1
Selected	252	34.2	0	1
Administration type of school where hired				
Public school	208	28.2	0	1
Subsidized private school	529	71.8	0	1
Socioeconomic level of the school where hired				
Low socioeconomic level	268	36.3	0	1
Med. socioeconomic level	296	40.2	0	1
High socioeconomic level	173	23.5	0	1

N=737 (total observations)

Results

The main results of the study are summarized in Table 5 and Table 6. First, in order to have a general picture of the characteristics of teachers hired by the Chilean subsidized sector 18 months after graduation, compared to teachers who were not hired, we ran a regression. Column (a) in Table 5 shows the results of a logit model and shows which characteristics of the graduates are related to getting a job in the subsidized sector.

Table 5
Estimation Results

VARIABLES	Logit		Ordered logit	Linear estimation	
	(a)	(b)	(c)	(d)	(e)
	Hired=1	Private=1	Socioeconomic type	Lang SIMCE	Mat SIMCE
Score on the final INICIA exam(% correct responses)	1.103	4.944**	1.581***	18.74***	28.08***
	(0.401)	(3.468)	(0.562)	(7.185)	(8.283)
Age	0.991	1.026	0.0187	0.318	0.467*
	(0.0113)	(0.0234)	(0.0188)	(0.232)	(0.267)
Gender (male=1)	1.048	0.860	-0.574***	-3.818	-6.717**
	(0.156)	(0.225)	(0.222)	(2.798)	(3.220)
Graduate studied in public school	1.689**	0.890	-0.506	-2.070	-4.331
	(0.380)	(0.402)	(0.359)	(4.412)	(5.077)
Graduate studied in private subsidized school	2.078***	1.585	-0.253	1.281	0.155
	(0.456)	(0.721)	(0.355)	(4.357)	(5.015)
Graduate's parents without higher education	1.067	0.617**	-0.322**	-4.622**	-5.123**
	(0.117)	(0.125)	(0.159)	(2.030)	(2.337)
Selectivity of the graduate's institution	1.001**	1.000	6.78e-05	0.0139**	0.0145*
	(0.000353)	(0.000662)	(0.000520)	(0.00660)	(0.00760)
Graduate studied in a full time diurnal program	1.445**	1.675*	0.885***	5.903*	7.821**
	(0.220)	(0.518)	(0.262)	(3.248)	(3.738)
Total enrollment in the graduate's program	1.000	1.001***	0.000832***	0.00781**	0.0114***
	(0.000173)	(0.000379)	(0.000261)	(0.00324)	(0.00373)
Length of the graduate's program	0.856**	1.201	0.0414	0.464	-0.601
	(0.0585)	(0.143)	(0.0963)	(1.235)	(1.421)
Constant	0.828	0.0623*		228.1***	213.3***
	(0.617)	(0.0898)		(14.85)	(17.09)
Cut 1			1.424		
			(1.170)		
Cut 2			3.275***		
			(1.176)		
Observations	1,538	737	737	737	737
R-squared				0.067	0.089

SE in parentheses
***$p<0.01$. **$p<0.05$. *$p<0.1$

The INICIA scores of teachers already working by 2010 were not significantly different from those of teachers who had not yet been hired. This means that highly qualified teachers could either be hired by subsidized schools, by private paid schools, or not be working in schools at all a year after graduation. A second finding is that graduates who came from more selective or full-time diurnal programs have a greater probability of getting a job in the subsidized sector, and this probability declines as program enrollment rises. Also, novice teachers who studied in private paid schools were found to have a lower probability of getting a job in the subsidized sector when compared with graduates coming from public and private subsidized schools.

Recruitment in Public versus Private Subsidized Schools

In column (b) of Table 5, the results of the logit estimation that compares recruitment in public versus private subsidized schools are presented. First, for private subsidized schools, there was a higher tendency to hire novice teachers with parents who had attended higher education and graduates with higher scores on their exit exams (INICIA). In fact, if the new teacher's parents have attended higher education, the predicted probability of starting off working at a private subsidized school is 80%; this probability is lower (68%) when the graduate's parents did not attend higher education. In terms of the graduates' qualifications on the INCIA exam, graduates with scores above the mean were 10 percentage points more likely to start working in private subsidized schools. The results also show that those graduates who come from full-time diurnal programs or programs with large enrollments have a higher probability of getting jobs in private subsidized schools.

Recruitment in Schools of Different Socioeconomic Status

Column (c) of Table 5 shows the results of the ordered logit model estimated, with the socioeconomic level of the school population as the dependent variable. Likewise, as the teachers' exit exam scores rise, there is an increase in the probability of getting a job in a school with a population of higher socioeconomic status. This probability is lower if the graduate's parents have no higher education; this is also the case if the graduate is a woman. The results also show that those graduates who come from full-time diurnal programs or programs with large enrollments have a higher probability of getting jobs in schools with higher socioeconomic levels.

In order to compare the magnitudes of the effects, we present the most relevant predicted probabilities of the model. For example, the probability of getting a job in a school with low socioeconomic population was 10.2 percentage points higher for graduates with scores below the national mean of the INICIA test than those with scores above the mean. In the same way, the probability of getting a job in a socioeconomically advantaged school was 8.6 percentage points lower for graduates with scores below the national mean. At the same time, graduates from part time evening programs had a predicted probability of 50% of starting to work in a school with a population of lower socioeconomic status, while this probability was only 34% for graduates who studied in full-time daytime programs.

Recruitment in Schools with Different student Learning Outcomes, as Measured by the National Test (SIMCE)

Table 5 shows that novice teachers from more selective institutions and those with higher scores in their exit exams (INICIA) tend to be placed in schools with higher results in the national test (SIMCE), both in language arts (column d) and in mathematics (column e). Also those graduates who came from full-time diurnal programs or programs with a large enrollment tend to be placed in schools with better results in both test.

Considering the magnitude of effects, we can state that graduates whose parents do not have higher education degrees will be employed by schools with an average of 5.1 points less on the

mathematics test and 4.6 points less in language arts, which is equivalent to 0.2 standard deviations from the national scores in both tests. On the other hand, in correspondence with an increase of one standard deviation on the graduate's INCIA exam scores, the average score of the school where the graduate will work increases by 2.8 points on the language arts test and 4.2 on the mathematics test, equivalent to 0.1 and 0.15 standard deviations from the average respective test scores of the schools in the sample.[20] Also graduates from full-time daily programs were hired at schools with an average of 5.9 and 7.8 points more than those from part-time evening programs, equivalent to 0.24 and 0.3 standard deviations from the language arts and mathematics test respectively.

Recruitment in Schools According to Different Quality Indicators: Using the SNED Indicators

Table 6 presents the estimations using the SNED indices as dependent variables. The six indices mentioned above were used, as well as a binary variable with a value of 1 if the school was selected for the award given to the schools that obtained a better evaluation.
Except for the indicator of school effectiveness (considered as learning outcomes of the school measured by SIMCE in different grades and for different years), graduate characteristics we controlled for are not related to the SNED quality indicators of the schools at which they start working. The relationship with the school's learning outcomes is consistent with the estimations already presented in columns (d) and (e) of Table 5. The magnitude is also similar; a one-standard-deviation increase in the INICIA score is related with a 0.16-standard-deviations effect in the effectiveness index of the schools in the sample.

No other SNED indicators show any relationship between the new graduates' characteristics and the school at which they got a job. When referring to graduates' program characteristics, we can only say that schools with improved working conditions (as reported by the national inspection system) are more likely to hire graduates from full-time diurnal, shorter-length, and higher-enrollment programs.

Summary of Results

Without a doubt, these results reveal a pattern of distribution of novice teachers in the Chilean educational system: novice teachers with better preparation in terms of subject knowledge and those who come from families with higher levels of education tend to be attracted to and hired by socioeconomically advantaged schools, which obtain better academic results, and generally by private subsidized schools, rather than by public schools. Conversely, novice teachers with a weaker knowledge base or who come from families without higher education are more likely to be placed in socially disadvantaged schools that exhibit lower results on national tests, and generally in public schools, rather than in private subsidized schools. This pattern reveals an uneven distribution of novice teachers according to their subject knowledge, which might negatively affect the availability of equal quality educational opportunities for students from different social backgrounds.

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[20] It is worth noting that the relationship between school and teacher performance does not have the problem of being endogenous, which tends to occur in similar estimations. This is because the school's SIMCE results are taken prior to the teacher being hired, so there should not be a problem of dual causality.

Table 6

Estimation Results (Continuation)

VARIABLES	Linear model						Logit
	(1)	(2)	(3)	(4)	(5)	(6)	(8)
	Effectiveness	Score Improvement	Initiative	Working Improvement	Integration	Equal opportunities	SNED grant selected=1
% of correct responses on the final INICIA exam	14.70***	0.174	11.43	-3.343	9.446	-0.667	0.965
	(3.904)	(2.079)	(7.606)	(4.148)	(7.496)	(1.115)	(0.615)
Age	0.182	-0.0277	0.180	0.0651	-0.131	-0.0267	1.017
	(0.127)	(0.0677)	(0.248)	(0.135)	(0.244)	(0.0363)	(0.0210)
Gender (male=1)	-3.554**	-0.287	1.199	0.0323	-0.195	0.00878	0.745
	(1.519)	(0.809)	(2.958)	(1.613)	(2.915)	(0.434)	(0.190)
Graduate studied in public school	-1.384	-0.200	4.590	-3.601	5.915	0.561	0.948
	(2.437)	(1.298)	(4.747)	(2.589)	(4.679)	(0.696)	(0.380)
Graduate studied in private subsidized school	0.852	-0.588	3.553	-0.0545	4.692	-0.138	1.279
	(2.405)	(1.281)	(4.685)	(2.555)	(4.617)	(0.687)	(0.504)
Graduate's parents without higher education	-2.408**	-0.240	-1.026	0.103	0.248	0.536*	1.066
	(1.113)	(0.592)	(2.167)	(1.182)	(2.136)	(0.318)	(0.193)
Selectivity of the graduate's institution	0.00837**	0.00233	0.000588	-0.00535	-0.00224	0.000834	1.002***
	(0.00361)	(0.00192)	(0.00703)	(0.00383)	(0.00693)	(0.00103)	(0.000612)
Graduate studied in a full time diurnal program	3.316*	0.429	1.105	3.873**	0.918	0.0551	1.019
	(1.765)	(0.940)	(3.438)	(1.875)	(3.388)	(0.504)	(0.298)
Total enrollment in the graduate's program	0.00545***	0.000453	-0.00287	0.00595***	-0.00335	-0.00156***	1.000
	(0.00176)	(0.000939)	(0.00344)	(0.00187)	(0.00339)	(0.000504)	(0.000281)
Length of the graduate's program	0.139	-0.538	-1.446	-1.487**	-0.918	0.0690	0.801**
	(0.673)	(0.358)	(1.311)	(0.715)	(1.292)	(0.192)	(0.0884)
Constant	26.45***	47.99***	73.45***	106.3***	71.20***	93.12***	1.040
	(8.049)	(4.287)	(15.68)	(8.552)	(15.45)	(2.299)	(1.370)
Observations	601	601	601	601	601	601	601
R-squared	0.098	0.009	0.010	0.063	0.006	0.055	

Standard errors in parentheses

***$p<0.01$. **$p<0.05$. *$p<0.1$

Discussion

In the context of a great expansion of teacher training programs and enrollment in Chile, along with a decrease in their selectivity, the aim of the study presented here was to explore the relationship between novice teachers' characteristics and their recruitment in different types of primary schools within the Chilean subsidized school system, controlling for characteristics of the institution at which they get their teaching degrees. While we do not intend to suggest that disciplinary knowledge is sufficient to predict positive professional performance, we sustain that it is a necessary condition. Consequently, this study is especially focused on the distribution of novice teachers with different levels of subject knowledge upon their graduation, an issue that needed to be studied in Chile.

Our study indicates that in Chile not all government-subsidized schools are equally able to attract new teachers with the best individual academic results. Once they have graduated, teachers with better performance on the exit exam that assesses their subject knowledge are not distributed homogeneously. The absence of quality controls and incentives to the best-prepared teachers maintains the inertia of the educational system, keeping the better-prepared teachers in private, socioeconomically advantaged and higher performing schools in terms of the learning outcomes of their students. This situation becomes even more worrying if we consider the low rates of teacher mobility between schools of different socioeconomic conditions or administration types (Cabezas et al., 2011), especially if we take into account the fact that the probability of moving to another sector or leaving the profession is lower in public schools, in socioeconomically disadvantaged schools, and in schools with lower scores on the national tests (Valenzuela & Sevilla, 2012).

Admittedly, there could be other relevant factors underpinning the distribution of new graduates, for example, geographical factors or salaries, which we were not able to account for due to a lack of information available for individual schools. However, the pattern of novice teachers' allocation described in this study offers a valuable empirical foundation, whatever the causes or underlying motivations that might explain this distribution.

The Chilean government has presented two complementary laws to parliament mandating that novice teachers need to pass the national exit exam in order to be hired in any state-subsidized school (which, in effect, makes the exam compulsory) and establishing a higher salary for those who perform in the upper 30% in their exit exams if they work in the subsidized sector. Furthermore, since 2011, high school graduates with the highest scores on university entrance exams who apply to initial teacher training programs receive full tuition grants. The condition to receive this scholarship is that the beneficiary must work for three years in the subsidized school sector (excluding private paid schools).

This study may help to inform the current debate about policies regarding initial teacher training of teachers and incentives to attract those with stronger academic backgrounds. Establishing a minimum that must be attained to become a teacher seems an appropriate measure to prevent novice teachers who perform below that minimum from being hired in schools in more disadvantaged areas, where they would have a high probability of staying for a long time, as recent studies have suggested (Cabezas et al., 2011, Valenzuela & Sevilla, 2012).

However, these laws and measures might not be enough to confront the problem of inequitable distribution of teachers with better preparation. The results presented here suggest that these high-performing students will tend to choose (or be attracted by) private

subsidized primary schools that draw students from medium or high socioeconomic backgrounds and schools with better national test results. If the goal is to tackle the inertia observed in this study and to increase equity in the distribution of better-prepared teachers, it would be advisable to complement these measures with an additional condition that requires novice teachers who performed well on their entrance or exit exams to start their teaching careers in disadvantaged schools in order to receive the salary incentive. Ideally, improved working conditions meant to attract better-prepared teachers to disadvantaged schools should combine salary increases with other non-pecuniary incentives or benefits, such as opportunities for professional development, for example. This study explored other school characteristics that might be related to the allocation of novice teachers in their first job, such as the level of initiative shown by the school, their level of inclusiveness, and the level of participation of teachers and parents. However, these factors seem to have no relation with the characteristics of the teachers hired by the schools, at least according to the indices considered here.

There is a substantial body of work in the domain of patterns of distribution of the teacher force within educational systems (Betts, Rueben, & Danenberg, 2000; Clotfelter, Ladd, & Vigdor, 2006; DeAngelis, Presley, & White, 2005; Lankford, Loeb, & Wyckoff, 2002; Lu, Shen, & Poppink, 2007; Owen, 1972; Wayne, 2002). However, research focused specifically on the first job placement of novice teachers is scarcer. The pattern of allocation in teachers' first job could have consequences on the overall distribution of highly qualified teachers, the most important resource in education, especially if the rates of teacher mobility in the most disadvantaged schools are low. This investigation intends to motivate further research examining whether the pattern observed in this study is common to other educational systems and thus, to support evidence-based policies aimed at reducing the observed inequality in the distribution of teachers starting from their first job.

This research also opens the path to further investigation of the motivations and variables that employers of different types of schools, and new graduates from different initial training programs and with different qualifications take into account when they decide whom to hire or where to work. Furthermore, this study offers a simple yet complete methodological approach that could be used for future studies in other countries where equitable access to well-prepared teachers is an issue of interest.

We are aware that it is still necessary to move ahead with research regarding the allocation and distribution of teachers in the school system, replicating studies for new cohorts of graduates from initial teacher training programs. However, this study is a step forward in research regarding new teacher placement in the school system: it provides evidence regarding what is happening in a developing country such as Chile, where we found a pattern of stratification of novice teachers as a function of their academic backgrounds, socio-cultural origins, and subject knowledge base.

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