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Article

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Provided in Cooperation with:
KSP Journals, Istanbul

Reference: Garces-Voisenat, Juan-Pedro Equality of opportunity in education.

Journal of
Economics and Political Economy
www.kspjournals.org
Volume 3 March 2016 Issue 1

Equality of Opportunity in Education: A Case Study of Chile and Norway

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Abstract. One of the most important determinants of the distribution of income and life opportunities is education. Increasing levels of formal schooling have contributed to raise standards of living and eradicate extreme poverty worldwide in recent decades. However, inequality in the distribution of income –which is the single most important indicator of relative access to material well-being- remains stubbornly high in most regions of the world. In this paper, I focus on two countries, Chile and Norway, which have very different educational systems, and follow the same analytical methodology of Schütz et al (2008) to detect differences in equality of opportunity between the two countries. In a slight variation, the family-background effect here is represented by a larger number of variables –including household income-, in order to pinpoint the specific characteristics that it comprises in each country. Surprisingly, I find that the family-background effect is stronger in Norway than in Chile, which would denote a potential higher inequality. However the higher achievement inequality in Chile is determined by other factors, which need urgent reform.
Keywords. Chile, Norway, education, inequality, equality of opportunity.
JEL. O15, I24, I25.

1. Introduction

Over the past few years, as poverty rates have decreased substantially in the developing world, concern about the distribution of income and life opportunities has taken precedence over the traditional goals of eradication of poverty and miserable life conditions in poor countries. While there is widespread recognition that the defeat of poverty is far from achieved, economists and social scientists have turned their eyes to the analysis of inequality and its causes, most notably since the publication of Capital in the 21st century (Piketty, 2013) and in a growing trend at least since the world financial crisis of 2008. Inequality is seen as the greatest injustice of modern times.

Piketty is not alone in denouncing inequality. Even though nobody seems to have gone as far as him in delving into the root causes of the problem –stirring worldwide controversy over his results and prescriptions-, there are several others that have also tackled the problem from different angles. Chomsky (2011) does it from an international perspective, reviving the dependency theories of the 1970s. Stiglitz (2012) and Krugman (2007) have warned about the dire consequences that inequality would be having on the very same capitalist system and even democracy, due to the concentration of economic and political power in the hands

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of a few. On a more detailed and technical perspective, Reich (2012) explains the ways in which inequality is turning markets inefficient and outlines policy prescriptions to reverse the trend.

Nonetheless, whatever might be said about the origin of the current stance in terms of inequality, most academic analysts tend to agree that one of the most important determinants of the distribution of income and life opportunities is education. If there is something that can give an edge to disadvantaged members of society is their amount of human capital, especially of the type acquired by education.

In modern societies, education is acquired primarily through formal schooling. Increasing levels of formal schooling have contributed to raise standards of living and eradicate extreme poverty worldwide in recent decades. However, inequality in the distribution of income –which is the single most important indicator of relative access to material well-being- remains stubbornly high in most regions of the world. Moreover, countries with similar levels of educational attainment –and often similar levels of average income- present dramatically different achievements in terms of equity. There are good reasons to think that a substantial part of the explanation might lie in the features of the educational system adopted by each country.

Schütz, Ursprung & Wößmann (2008) measured equality of opportunity in education for 54 countries with data on test scores and demographic characteristics provided by the TIMMS standardised international tests of cognitive achievement. They identified a "family-background effect" as the main determinant of inequality of opportunity in education. In this paper, I focus on two countries, Chile and Norway, which have a similar equality ranking in Schütz et al (2008), but very different educational systems (one largely privatized and the other one of the free-education-for-all type), and follow the same analytical methodology to detect differences in equality of opportunity between the two countries. However, the family-background effect here is represented by a larger number of variables –including household income-, in order to pinpoint the specific characteristics that it comprises in each country. The dataset was obtained from the PISA database for the international standardized tests of 2009.

There are some questions which beg for an answer: Are education systems worldwide simply perpetuating the statu quo in terms of distribution of resources? Will making education more egalitarian reduce inequality overall and increase equality of opportunity for the most disadvantaged people in society? And how do we make education more egalitarian? The cases of Chile and Norway shed some light into answering these questions. The answers, unfortunately, seem not to be so clear-cut. But the elements of analysis that this case study provides could lead to policy prescriptions that help to level the field in the game of opportunities. This is particularly important at a moment when the Chilean government is proposing sweeping reforms that would practically reverse the private-minded education system implemented since 1981, in which the State plays only a subsidiary role as a provider of education.

2. The Chilean and Norwegian education systems

In Norway, education is completely socialized. The State sees it as its duty to provide free education for all citizens at all its levels. On the other end, citizens conceive education as a social right, as is well illustrated by Klingstedt (2001). Given the enormous amounts of resources that are destined to the education budget, quality is almost assured. For example, a school student can expect to receive around 20% of GDP per capita in any given year. Since public education is

free, guaranteed and of good quality, there is little space for private initiative in education to prosper. The very few private schools that exist have religious or special-education purposes.

School education is divided into kindergarten, primary (grades 1-7), lower secondary (8-10) and upper secondary (11-13). Kindergarten, primary and lower secondary are managed by the municipalities, with full funding from the State. Upper secondary is run by the counties, with State funding as well. One of the characteristic features of the Norwegian system that has been highlighted by the experts is that tracking of students occurs at a rather late stage, only in upper secondary school.

There is no selection in primary and lower secondary Norwegian education, but rather a declared purpose of giving a high level of basic education to all citizens aged 6-16.

By contrast, in Chile most of the primary and secondary education is provided by the private sector. The State has a subsidiary role, mainly as a guarantor that children in school age will have access to some type of education. There are basically three types of schools: fee-paying private (about 10% of the education supply), subsidized private (55% and growing) and municipal (35% and declining). Both the subsidized private and the municipal ones receive a voucher per student from the State.

The subsidized private schools receive a subsidy because in principle they should be mostly free for the students. However, due to circumstances (among others, the low amount of the voucher-subsidy), in most of these schools the parents have agreed to participate with some form of co-payment to enhance the education of their children. This has stirred much controversy in recent years, especially due to the fact that some private providers have been obtaining “profits” in the management of the schools.

The Chilean municipal schools are managed by municipal corporations in a totally decentralized way. They are not accountable to the Ministry of Education; only to the mayor of the municipality. This has increased competition between them, trying to capture the greatest possible amount of students, which provides them with more voucher-subsidies from the State. As a consequence, the quality in many of these public schools has grown, but at the same time municipal budgets have been eroded, as the municipalities feel obliged to reinforce the quality of their schools by adding financial resources to their funding, to complement the always scarce resources of the subsidies.

Finally, the fee-paying private schools thrive. They represent only around 10% of the total education supplied in the system, but they can charge high fees to a relatively captive clientele, as parents from the upper Chilean class would not send their children anywhere else. They normally have state-of-the-art facilities and ample opportunities for the students to develop extra-curricular activities.

Most analysts of the Chilean system agree that the system cannot last much longer without some kind of reform. But the proposals differ radically, ranging from a semi-socialization of the system (allowing private schools to function, but banning profits and selection, and centralizing the management of the municipal schools in the Ministry of Education, as it was before 1981) to a greater liberalization that increases the State subsidies for private and municipal management.

Many in Chile see the segregated educational system as the main cause of the high level of income inequality in the country, with a Gini coefficient stubbornly above 50% for most of its recent history. By contrast, Norway has a Gini of only 25%.

3. Literature on educational inequality

The family background effect has always been present in determining life opportunities, and it gets reflected primarily on the type of education that people receive. So education acts sometime as a reinforcing mechanism of inequality, by locking in people into their social of economic status. As early as 1968, the eminent sociologist James Coleman pondered about this issue (Coleman, 1968), and concluded that it is extremely difficult to integrate everyone into the same learning environment. However, he maintained hope in the capacity of the teachers to integrate the students inside the classroom by understanding their family origin.

There have been numerous attempts to calculate inequality of access to education. Measurements of equality in achievement (ie, quality) are harder to find. Both Thomas et al (2000) and Benaabdelaali et al. (2012) calculate Gini indexes of education, measuring equality of access, and find very hopeful trends both in developed and developing countries. The first study finds a sort of education Kuznets curve in an analysis of 85 countries from 1960 to 1990. The second one carries out a study of 146 countries in the period 1950-2010, and finds that their calculated Gini index of education falls from 0.73 in 1950 to 0.36 in 2010 for developing countries. But both studies are basically measuring access, not achievement.

The same trend is found in the school attainment data of Barro & Lee (2010). The average years of total schooling at least double for most countries in the period 1950-2010, and even triple or quadruple for some of them. In Norway they rise from 7.5 to 11.8, and in Chile from 4.7 to 9.7.

But these numbers mask a more subtle reality in the case of many countries. What quality of education are children getting in the different countries of the world? And how is that quality distributed within the different sectors of society in any given country? At least for the case of Chile, this type of analysis is not very favourable. Torche (2005) argues that there is persistent educational inequality across cohorts since 1950 in Chile, and that social stratification hasn't changed at all, regardless of the change of system in 1981. This educational stratification leads, in turn, to low occupational mobility, particularly at the top of the socioeconomic ladder. Along the same lines, Núñez & Miranda (2007) state that low educational and income mobility have led to an income distribution that is quite egalitarian for 80-90% of the population, but very unequal when the top 10% is considered. And Carvalho et al. (2013) find that Chile is the most unequal country in Latin America in terms of educational achievement, with parental education and type of school as the main determinants of this inequality. Ramos et al. (2013) have the same impression, pointing to the type of school as one of the main factors of discrimination in the labour market in Chile.

Parry (1997), while celebrating the success of the Chilean process of education privatization, already warned of its shortcomings. She argued that the liberal reforms of 1981 had introduced the right degree of decentralization for the system to work efficiently. However, she observed a regression in terms of equity, basically due to the lack of central support and regulation. Amar (2007) adds that public expenditure per student is now lower than in 1970.

Since the type of school seems to be an important element of social and economic discrimination in Chile, it is worth asking ourselves why is this the case. Drago & Paredes (2011) find that in Chile, when socioeconomic conditions are taken into account, the difference of quality between fee-paying private and public schools is very small, but there is a significant difference between municipal (public) and subsidized private schools, in favour of the latter ones. The authors

wonder what might be causing this result. Garces (2009) arrives to the same conclusions in a study that measures the determinants of academic achievement of 10th grade students in national standardized tests. He explains the results by differences of the schools in terms of decentralization, accountability and resources. The astounding low performance of fee-paying private schools is explained by stratification. Going to one of those schools is like belonging to an exclusive club. It provides a strong signal in the labour market.

Mizala & Romaguera (2002) address the problem of low quality of education in most Chilean schools by pointing to the lack of incentives. It would be necessary to provide incentives to teachers and schools based on their results, rather than just a fixed subsidy per student recruited.

Finally, going deeper into the problem of inequality of opportunity posed by unequal achievement, Schütz et al. (2008) carry out a study of 54 countries using results of the TIMMS tests. Basically, they try to estimate the family-background effect (FBE) on academic achievement. For that purpose, they use a measure of "books at home" to represent the socioeconomic level of the household. The higher influence of "books at home" would be a reflection of higher inequality of opportunity in education.

4. Measuring relative education inequality in Chile and Norway

In what follows, we attempt a very simple exercise using data from the PISA test results of 2009, administered by the OECD. These are standardized tests in mathematics, science and reading applied to 10th grade students (15-16 years old) in different countries. They are administered to some 500 thousand students from 70 countries around the world, not all members of the OECD. In 2009, the country average scores ranged from 325 to 577, with an OECD average of 497. Norway had an average score of 500, while Chile obtained 439.

Following Schütz et al (2008), I propose the following basic linear regression:

$$T_{isj} = \alpha_j + \beta_j FBE_{isj} + \gamma_{1j} A_{isj} + \gamma_{2j} G_{isj} + \gamma_{3j} PS_{isj} + \varepsilon_{isj} \quad (1)$$

T: test scores
FBE: family background effect
A: age of student
G: gender of student
PS: dummy for attendance to pre-primary school
i: student, s: school, j: country (1,2)

For FBE I use alternative variables (books at home, parental education, household income, study implements at home).

Additionally, we have added other variables to reflect characteristics of the schools which may affect the student's performance.

The regressions use panel data with individual observations corresponding to one student. The students are grouped in the different schools in which the test is given. There are separate regressions for Chile and Norway, in order to compare the coefficients between them.

The explanation of the different variables in the regressions is as follows:

- Test scores: PISA 2009, OCDE, average of reading, maths and science, max 723, min 179, mean 469

- Books at home (books), 6 cats: 0-10 (1), 11-25 (2), 26-100 (3), 101-200(4), 201-500(5), 500+(6)
- Age: in years, with two decimals (15-17)
- Gender: 1 for male, 0 for female
- Pre-primary education (pre-prim): 1 yes, 0 no
- Parental education (par-ed) (average of both parents), 5 cats: ISCED 3A (1), ISCED 3B-3C (2), ISCED 2 (3), ISCED 1 (4), ISCED 1 not complete (5). Notice that the categories ascend as the level of education decreases.
- Study implements at home (at-home): availability of desk, own room, quiet place, computer, internet connection and printer at home. Each one of them is categorized as 1 or 0, depending on whether they are available or not. Then the average is taken to construct the variable.
- Study facilities at school (in-school): availability of library, computer, internet connection and printer at school. Each one of them is categorized as 1 or 0, depending on whether they are available or not. Then the average is taken to construct the variable.
- Annual household income (h-income): reported by parents. This is in six categories, which represent ranges of income. Categories ascend with income.
- Decentralization of schools (decent): this variable captures the level of decentralization of the schools, as reflected by whether the principal or governing board (1) take decisions, rather than the regional or national authority (0), in matters of salary increases, budget allocation and student admission. The three scores are averaged to construct the variable.

The results of the regressions are presented in Tables 1 to 3.

Table 1. *The results of the regressions*

Dep vble: test scores	Chile	Norway	Chile	Norway
Books	8.2	21.4		
	[0.000]	[0.000]		
Par-ed			-6.7	-30.4
			[0.000]	[0.000]
Age	6.9	6.1	6.5	8.5
	[0.010]	[0.123]	[0.017]	[0.042]
Gender	9.9	-7.1	8.6	-12.6
	[0.000]	[0.002]	[0.000]	[0.000]
Pre-prim	8.5	15.3	8	15.9
	[0.000]	[0.000]	[0.001]	[0.000]
cons	306	322	347	414
	[0.000]	[0.000]	[0.000]	[0.000]
obs	4736	3893	4736	3893
R^2 (adjusted)	0.15	0.18	0.13	0.09

Notes: All regressions have school fixed effects. [P-values in parentheses]
Source of data: OCDE, PISA 2009

Table 1 presents a summary of the basic regressions. Age, gender and pre-primary education are used as controls throughout the whole set of regressions. They have the expected sign and are significant for the most part. Just as a matter of curiosity, the male gender seems to obtain better results in Chile but worse results in Norway. An increase in age tends to increase test scores, but not always very significantly. And the attendance to pre-primary education always favours academic achievement in a clear significant way.

Surprisingly, the FBE effect, measured by either books or parental education, is much stronger in Norway than in Chile, and in a convincingly significant way. Which makes us wonder: If not in family background, where is the source of inequality in Chile?

Table 2. *FBE effect*

Dep vble: test scores	Chile	Norway	Chile	Norway
at-home	16.2	126.7		
	[0.000]	[0.000]		
in-school			-5.7	24.6
			[0.069]	[0.003]
Age	6.1	7.6	5.9	8.5
	[0.022]	[0.075]	[0.026]	[0.049]
Gender	8.9	-11.9	9.3	-11.7
	[0.000]	[0.000]	[0.000]	[0.000]
Pre-prim	9.1	18.3	9.8	22.3
	[0.000]	[0.000]	[0.000]	[0.000]
cons	329	258	346	338
	[0.000]	[0.000]	[0.000]	[0.000]
obs	4736	3893	4736	3893
R^2 (adjusted)	0.09	0.05	0.02	0.02

Notes: All regressions have school fixed effects. [P-values in parentheses]
Source of data: OCDE, PISA 2009

In Table 2, we try to measure the FBE in a different way. We assess the influence of study implements at home on the test scores. Here the difference in favour of Norwegian students is crushing. There seems to leave no space for doubt. The family-background effect is definitely stronger in Norway than in Chile. And that leads us to a second question: How do the Norwegian schools counter this powerful influence of the FBE to produce such incredible egalitarian results in terms of academic achievement and opportunities in the labour market?

We have added two regressions to contrast the influence of the school on scores in the two countries. The variable "in-school" summarizes the availability of important study facilities at school. The variable has a strong significant influence in Norway but not in Chile, which suggests an inefficient use of resources in the school system in Chile.

Table 3. *Shows two types of regression*

Dep vble: test scores	Chile	Chile	Chile	Norway
	(school FE)	(school FE)	(OLS, no FE)	(OLS, no FE)
h-income	-1.8	-2.6		
	[0.002]	[0.000]		
at-home		16.9		
		[0.000]		
in-school		-6.5		
		[0.049]		
books			20.5	23.2
			[0.000]	[0.000]
decent			47	-1.3
			[0.000]	[0.803]
Age	9.3	6.7	9.2	6.5
	[0.001]	[0.018]	[0.010]	[0.113]
Gender	26.5	8.3	8.1	-8
	[0.000]	[0.000]	[0.000]	[0.001]
Pre-prim	10.9	10.4	21.4	18.4
	[0.000]	[0.000]	[0.000]	[0.000]
cons	268	332	191	307
	[0.000]	[0.000]	[0.001]	[0.000]
obs	4317	4317	4317	3780
R^2 (adjusted)	0.02	0.05	0.2	0.18

Notes: [P-values in parentheses]
Source of data: OCDE, PISA 2009

Finally, Table 3 shows two types of regression. The first two regressions try to capture the influence of household income on academic achievement in Chile (unfortunately the income question was not included in the parent questionnaire for Norway). As we can see, when reasonable controls are included, there is no advantage of well-off students. On the contrary, it seems that more affluent students perform more poorly (complacency?). The robustness of this result is tested on regression 2 by adding 2 more control variables, and the significance of the previous result is reinforced.

In conclusion, the family background effect in Chile is very weak (at least on academic achievement) and almost non-existent.

The last two regressions refer to another type of story, which is related to the type of reforms that might be needed in Chile. We include in them the usual controls plus the most significant FBE variable (books). And we introduce a variable that measures the degree of decentralization in the management of the schools. In Norway, this variable seems to be not significant at all. By contrast in Chile it is one of the most quantitatively (and statistically) significant ones in its effect on the test scores. The result tells us that a student from a decentralized school can expect to score 47 points more on the tests than their peers of centralized schools. The difference with Norway might be due idiosyncratic institutional factors, impossible to discern in this study.

5. Some final considerations by way of conclusion

The Chilean and Norwegian education results are known to produce very different results in terms of equality of opportunity before the labour market and life situations in general. This is recognized by most analysts of the subject. There is an equalizing environment in Norwegian education that somehow channels the abilities and capacities of diverse students into paths of productive professional development no matter what their family background.

As we have seen in the results presented in this study, the family background effect is very strong in Norway, and apparently stronger than in Chile. The virtues of the school system there are strong enough to counter this initial advantage of some students and equalize opportunities for all.

What can be said about this hypothetical superiority of the Norwegian school system? At least one thing: The State there devotes many more resources to students than in Chile. To give only a few examples: The expenditure per pre-primary student in Norway doubles that of Chile, and the expenditure per school student is three times higher in Norway than in Chile. The ratio of students to teaching staff is 23.4 in Chile, while only 10.2 in Norway.

Reforms are clearly needed in Chile, especially to level the field for more disadvantaged students. With a general increase in academic achievement, more disadvantaged students would be able to threaten the privileged situation of the more affluent ones, whose advantage is based only on social stratification and not on achievement. They will become more competitive.

In summary, this problem of inequality is basically a problem of quality.

Chile would not do well in scrapping completely the educational system in place. Some things are working well; for example the decentralized nature of the system. But the country needs to inject many more resources into the system, perhaps increasing the amounts of the subsidies both to private and municipal schools.

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