

Nature or Nurture: Private Tutoring and Education Inequality*

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Abstract

In 1980s, Korea changed the policy on private tutoring quite dramatically: it was almost completely prohibited in 1980 but liberalized later in 1989. We use such a dramatic policy change to examine the impact of private education on the number of students who entered prominent universities such as Seoul National University and Yonsei University. We find from the empirical analysis that since the legalization of private tutoring in 1989, the number of such students has increased significantly in wealthier regions like *Gangnam* or the Capital area, compared with less wealthy regions. This finding indicates that wealthy households have benefitted from the liberalization of private tutoring disproportionately more, as only those households could afford costly private investment in education like private tutoring.

KRF Classification : B030400, B030500

Keywords : Private Tutoring, Education Inequality,
Intergenerational Mobility, Korea

* The authors thank two anonymous referees of this journal for their insightful comments and suggestions. We are also grateful to seminar participants in various institutions and conferences for their helpful discussions.

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I. Introduction

Many people believe that education should improve intergenerational mobility or alleviate the transmission of socio-economic inequalities across generations. If people with different family backgrounds have an equal opportunity of education, socio-economic status of parents would have less impact on that of their children. The literature on the intergenerational mobility, however, found that there is a significantly positive correlation in earnings between parents and children (Solon 1999, 2002, and d'Addio 2007). Moreover, education inequality can strengthen the intergenerational transmission of socio-economic inequalities, as children of wealthier parents tend to have more opportunities for higher and better education.

The policy changes regarding private tutoring in Korea—strict prohibition beginning 1980, followed by the legalization in 1989—provide a good laboratory to analyze the effects of economic inequality on education attainment. We find that since private tutoring was allowed in 1989, the shares of wealthy regions in students entering two prominent universities in Korea, i.e., Seoul National University (SNU) and Yonsei University, have increased disproportionately compared to less wealthy regions. This result suggests that the wealth of parents has a significant impact on education attainment of their offspring. It also implies that the transmission of economic inequalities could be at least in part due to investment in education rather than inherited intellectual abilities. The finding also has a policy implication that government can encourage intergenerational mobility by increasing public investment in education so that inequality in education investment may be reduced.

The findings and policy implications of this paper are consistent

with the previous findings in the literature. For example, Solon (2004) suggests that government can increase intergenerational mobility by having progressive public investment in education. In addition, d'Addio (2007) documents the role of education in inequalities across countries. In most countries, education inequality seems to reduce intergenerational mobility, and thus policies that alleviate education inequality can lessen the intergenerational transmission of economic disadvantages.

II. Background

Until 1970s, private tutoring had been legal in Korea. In 1980, however, the Korean government that newly took administrative power began to strictly prohibit private tutoring as well as most of private education in the secondary level. This policy had been in effect for nine years and the violation of the regulation could lead to a severe penalty including imprisonment. Therefore, most households did not get their children privately tutored. Since 1989, however, the regulation has been dramatically relaxed. The ban on private tutoring was removed in 1989 and a series of policy changes has liberalized the private tutoring and most forms of private education in the secondary level. Such policy changes would bring about differential responses in terms of investment in education, which in turn could widen the gap in education attainment between the wealthy students and middle- or low-wealth students. Therefore, taking a closer look at the relative performance of students with different economic backgrounds before and after the lift of the ban allows us to answer questions about the inequality in education.

III. Data and Empirical Results

III.1. Data

We collected data on the number of entrants into two top universities in Korea, SNU and Yonsei, by region, using information in graduation records. The dataset covers students who entered those universities during the period from 1980 to 2001, from 29 regions of Korea.¹⁾ The full list of regions in our dataset is provided in Appendix, along with the average number of entrants to the top universities per 10000 population for each region. We also make use of region-specific socio-economic variables such as population and the average property tax, available from government statistics. Table 1 reports the summary statistics for the variables used for our analysis.

【Table 1】 Summary Statistics

	Obs.	Mean	Std. Dev.	Min	Max
Number of students entering					
Seoul National University	520	91.4	93.0	1	587
Yonsei University	636	126.2	131.1	5	1003
Top two universities	520	221.6	194.9	17	1262
Total number of University entrants					
Seoul National University	521	2638.9	973.5	885	4175
Yonsei University	637	3652.4	1059.9	1294	5285
Top two universities	521	6399.5	1405.2	3464	8661
Population (thousand persons)	635	1502.6	1503.9	122.5	9544.5
Average real property tax per head (Year 2000 constant prices)	635	17627.5	13127.7	2785	90084

1) The data for Yonsei University is available for the whole sample period from 1980 to 2001, while that for Seoul National University is only from 1980 to 1997.

III.2. Empirical Results

Table 2 displays average shares of the Capital area and *Gangnam* in entrants into the top two universities, before and after 1989, when private tutoring was allowed. The Capital area is the metropolitan area consisting of *Seoul* and its neighborhood whereas *Gangnam* is a region in *Seoul*, where the rich are concentrated. Table 2 shows clearly that both regions have seen their shares in students entering the two prestigious universities rise. The trend is particularly noticeable for *Gangnam*. While its population share rose by only 0.37% points between pre- and post-1989 periods, the share of students in the top two universities increased significantly by 2.99% points.

[Table 2] Average Shares of *Gangnam* and Capital Area in Top Two University Entrants (%)

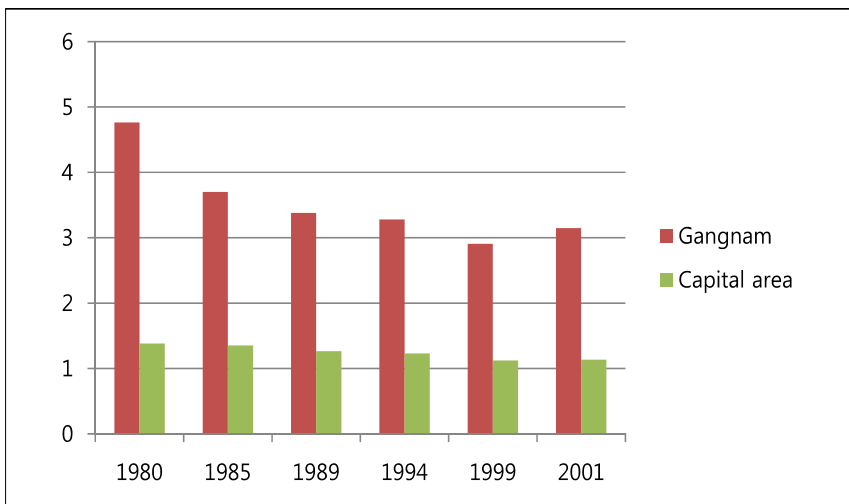
	Capital Area (A)		<i>Gangnam</i> (B)		(B)/(A)	
	Pre-1989	Post-1989	Pre-1989	Post-1989	Pre-1989	Post-1989
Population	38.16	44.88	1.71	2.08	4.48	4.63
SNU entrants	61.94	69.76	11.48	14.78	18.53	21.19
YU entrants	78.78	80.23	11.52	14.04	14.62	17.50
Entrants to the two universities	71.68	75.02	11.49	14.48	16.03	19.30

Note: 1. Capital area consists of *Seoul*, *Incheon*, and *Gyeonggi* province. *Gangnam* is a part of *Seoul*, and hence it belongs to the Capital area. 2. All values above are simple averages of respective shares over a given period. However, averages shares in the Seoul National University entrants and in total entrants for post-1989 are taken over the period from 1989 to 1997, instead of 2001, due to the lack of data availability.

Why did students from *Gangnam* or, more broadly, the Capital area perform better, especially following the legalization of private tutoring? Figure 1 gives a clue to answering this question. It displays the average real property tax per head of two regions relative to the national average. According to the figure, an average person in

Gangnam has paid about three times higher property tax than an average person in Korea. Also, the value for Capital area is little higher than the national average. The figure, therefore, clearly shows that two regions are relatively wealthy in Korea, since the amount of property tax reflects the value of real estate properties per person in the sense that property tax rates are similar across regions in Korea. In fact, *Gangnam* has always been ranked the top or the second in terms of the average property tax per head.

[Figure 1] Real Property Taxes per Person of the Capital Area and *Gangnam*



Note: National average is normalized to unity.

Considering that wealthy households have been concentrated in *Gangnam* or, more broadly, in the Capital area, we attribute the improved performance in education compared with other regions to the increased educational investment such as private tutoring. In other words, even if the government allows private tutoring, it would be affordable only to relatively rich households, since private tutoring is quite costly. As a result, relatively wealthy families would benefit disproportionately more from the expanded education

opportunity thanks to the legalization of private tutoring. If this hypothesis is indeed the case, it might have important implications on education inequality and the debate on “Nature or Nurture,” as considered later.

Table 3 reports the main empirical results that would test the hypothesis in the previous paragraph. In the empirical analysis, we estimate the difference-in-difference models by the OLS. We begin with a couple of findings robust to specification in Table 3. First, the tutoring dummy itself is insignificant regardless of the specification and the dependent variable. This means that average families living outside the Capital area have not benefitted from the liberalization of the private tutoring, as it might not be affordable, which seems to confirm our hypothesis in the previous paragraph. Second, the coefficient on the average real property tax per head is quite significant and quantitatively large. This result suggests that wealth has a very strong positive impact on the number of entrants to the top universities, as expected.

With regard to the Capital area, columns (1) through (3) of Table 3 report the result that the coefficient on the Capital area dummy is significantly positive regardless of the dependent variable. This implies that the Capital area had sent more students to the top two universities even before the private tutoring was allowed. This finding is consistent with the observation from Table 2 that the Capital area has the much higher shares in students entering the top two universities compared to its population shares over all sample periods. The interaction term with the tutoring dummy is, however, only weakly significant. This is plausible because the Capital area overall is not as affluent as *Gangnam*. Relatively poor households in the region would not have gained much from private tutoring, which in turn could weaken the effect of the private tutoring on richer regions of the Capital area, like *Gangnam*.

[Table 3] Regression Results

	Dependent variable: The number of entrants to universities					
	(1)	(2)	(3)	(4)	(5)	(6)
	Seoul National Univ.	Yonsei Univ.	Overall	Seoul National Univ.	Yonsei Univ.	Overall
Log (average real property tax per head)	52.67 (7.63)***	69.22 (9.09)***	119.39 (15.19)***	15.61 (7.22)**	36.90 (10.22)***	49.39 (14.66)***
Capital area dummy (A)	37.07 (11.78)***	148.78 (15.05)***	185.48 (23.47)***			
Gangnam dummy (B)				193.38 (23.43)***	234.93 (36.34)***	431.42 (47.59)***
Tutoring dummy (C)	-9.00 (11.12)	-14.19 (13.70)	-28.06 (23.82)	5.53 (5.88)	2.28 (8.63)	-6.12 (14.25)
Interaction term (A)*(C)	33.53 (13.74)**	32.10 (16.81)*	59.85 (27.37)**			
Interaction term (B)*(C)				110.64 (30.96)***	162.50 (44.68)***	339.83 (62.89)***
Observations	518	634	518	518	634	518
R-squared	0.377	0.448	0.437	0.527	0.412	0.555

Note: 1. Standard errors are in parentheses. 2. *, **, and ***, respectively, indicate 10%, 5%, and 1% significance. 3. All specifications include population and total number of university entrants as control variables but coefficients on those variables are not reported.

However, focusing on *Gangnam*, we can see disproportionate gains of a richer region from private tutoring more clearly. In columns (4) through (6) of Table 3, both *Gangnam* dummy and its interaction term with the tutoring dummy have significantly positive coefficients. It suggests that *Gangnam*, the wealthiest region in Korea, had performed well even under the regulation on private tutoring. Moreover, such an advantage has become even stronger upon the legalization of private tutoring, because households in the region were wealthy enough to afford private tutoring as well as other forms of private education.

It is also noteworthy that dummies associated with *Gangnam* or the Capital area are significantly positive despite the fact that the average real property tax is included in the regressions. This indicates that those wealthy regions must have benefitted from the legalization of private tutoring not only through the wealth channel, captured by the average real property tax, but also through other channels, such as income effect, peer effect, or the concentration of families with greater educational aspirations. While we do not try to disentangle those channels, we think it is an interesting direction for future research.

The findings of the empirical analysis have a few interesting implications. First, inequalities in income or wealth can aggravate inequalities in education performance. As wealthier families can invest more in education, their children are likely to have more education opportunities and thus, quite possibly, perform better. Then, since entering top universities can be a stepping-stone to higher income over the life cycles, offspring from wealthier families can inherit the socio-economic advantages of their parents. In this sense, the legalization of private tutoring seems to have helped the intergenerational transmission of the inequalities by eliminating constraints on education investment of the wealthy.

Our findings also provide a lesson on the debate about “Nature or Nurture.” The positive correlation in earnings between a parent and a child occurs due to the inheritance of intellectual abilities and/or larger education investment of the parent for the child. Our empirical results seem to lend support to the “Nurture” hypothesis. Otherwise, *Gangnam* would not have significantly increased its share in entrants into the top universities after private tutoring was allowed. In other words, significantly positive signs of the coefficient on the interaction term between *Gangnam* and tutoring dummies indicate the role of education investment in reducing the intergenerational mobility.

IV. Conclusion

Using the data on the number of entrants to the two prestigious universities in Korea, we showed that *Gangnam*, the wealthiest region in Korea, has benefitted significantly from the legalization of private tutoring. Wealthier households could exploit the expanded opportunities enabled by private tutoring as well as other kinds of investment in education. Therefore, the inequalities in income and wealth, combined with private tutoring, turn out to have widened inequalities in education performance, measured by the number of students entering the top universities.

Received: March 11, 2015. Revised: April 18, 2015. Accepted: May 2, 2015.

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Appendix. List of regions and region groups

In the following table, we report all regions in the sample, which consist of 17 regions of Seoul and 12 provinces and cities, along with the ratio of entrants to SNU and Yonsei to population.

(Unit: per 10000 persons)

region	entrants /population	region group	region	entrants /population	region group
Gangnam-Seocho, Seoul	9.07	G, C	Jongro, Seoul	3.61	C
Gangdong-Songpa, Seoul	3.01	C	Jung, Seoul	1.81	C
Gangseo-Yangcheon, Seoul	2.82	C	Gyeonggi	1.05	C
Gwanak, Seoul	5.81	C	Incheon	0.88	C
Guro-Geumcheon, Seoul	1.49	C	Gangwon	1.18	
Dobong-Nowon-Gangbuk, Seoul	1.69	C	Gyeongnam-Ulsan	0.54	
Dongdaemun-Jungrang, Seoul	1.37	C	Gyeongbuk	0.39	
Dongjak, Seoul	3.68	C	Daegu	0.67	
Mapo, Seoul	4.35	C	Busan	0.72	
Seodaemun, Seoul	7.98	C	Jeonnam-Gwangju	0.52	
Sungdong-Gwangjin, Seoul	2.19	C	Jeonbuk	0.53	
Sungbuk, Seoul	2.09	C	Jeju	0.91	
Youngdeungpo, Seoul	3.26	C	Chungnam-Daejun	0.48	
Yongsan, Seoul	3.07	C	Chungbuk	0.57	
Eunpyung, Seoul	3.60	C			

Note: 1. Entrants/population refers to the ratio of the entrants to SNU and Yonsei to population. Both the number of entrants and population are averages over the sample period for each region. 2. In the region group, G and C, respectively, stand for *Gangnam* and Capital area.

타고나는 것인가 교육되는 것인가? 과외와 교육 불평등*

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논문초록

우리나라는 1980년대에 과외에 관한 정책을 급격히 바꾸었다. 즉 1980년에 과외를 거의 완전히 금지했지만 1989년에 다시 자유화했다. 이 논문에서는 이러한 정책 변화를 활용하여 사교육이 서울대와 연세대와 같은 명문대학 입학생 수에 미치는 영향을 분석한다. 실증분석의 결과, 1989년에 과외가 합법화된 이후 서울대와 연세대 합격자 수가 상대적으로 부유한 지역(강남, 수도권)에서 크게 늘었음을 알 수 있다. 이러한 결과는 부유한 가구가 과외와 같은 사교육을 경제적으로 감당할 수 있기 때문에 덜 부유한 가구에 비해 과외 자유화로부터 더 큰 이익을 얻었음을 시사한다.

주제분류 : B030400, B030500

핵심 주제어 : 과외, 교육 불평등, 세대간 이동성, 한국

* 저자들은 이 학술지의 익명의 심사자 두 분의 논평과 제안에 대해 감사 드린다. 더불어 여러 기관과 학회에서 이 논문에 대해 토론해 주신 세미나 참석자들에게도 감사를 드린다.

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