

The Determinants of the Transition in South Korea from Vocational and General High School to Higher Education, Including a Gender Comparison

Seonkyung Choi¹

¹Center for the Study of International Cooperation in Education, Hiroshima University, Hiroshima, Japan
Correspondence: Seonkyung Choi, 1-5-1 Kagamiyama, Higashi-Hiroshima, Hiroshima University, Japan

Received: April 7, 2020

Accepted: May 3, 2020

Online Published: May 12, 2020

doi:10.5430/ijhe.v9n4p1

URL: <https://doi.org/10.5430/ijhe.v9n4p1>

Abstract

This study examines the factors determining whether vocational and general high school students in South Korea subsequently graduate from university and, if so, whether from 2-year or 4-year courses, for the first time using a gender lens. High-quality official data from the Korean Education and Employment Panel (KEEP) is used in a multinomial logit model. The results show that coming from a vocational high school (compared to a general high school) is negatively correlated with going to university, especially to 4-year university. Among general high school graduates, the most important determinant of attending a 4-year rather than a 2-year university is the teacher assessment of the student's performance; father's education and income have no effect for either males or females. The results also show that vocational high school graduates' university choice is determined by a combination of individual characteristics, including being male, and by having been at a vocational high school, whereas the choice between 2-year and 4-year university depends negatively on father's education for males but not for females and on father's income and the number of siblings for both genders. The income and sibling findings suggest that a possible policy implication might be to provide financial support to vocational high school graduates to enable them to attend higher education and to offset the negative effect of low paternal income.

Keywords: vocational education, higher education, school choice, youth unemployment, gender, multinomial logit model, South Korea

1. Introduction

Paik and Shim (2017) observed that those who enroll in higher education believe that it will further their careers. Even at an early stage of their university enrollment, they perceive that they will not only achieve a high level of specific education but will also gain access to career identity, concrete career preparation behavior, and appropriate control of their futures to ensure a decent career after university. These steps are important for future work and life as both an individual's role in society and their career identity are strongly linked to concrete career preparation behavior (Lee, 2013).

This perception has led both general and vocational high school graduates to enter university, resulting in South Korea having one of the relatively highest university enrollment rates in the world (Keum, 2002; Eom, 2007). In addition, the perception that vocational high school graduates are undervalued in Korean society is also making vocational high school graduates enroll in university, even though their initial purpose in attending vocational high school was to enter the labor market right after graduation (Kim, 2007). Vocational high school graduates' rates of university enrollment have gradually increased from 44.9% in 2001 to 71.1% in 2010 (Korean Education Development Institute statistics: KEDI, 2018). This new paradigm is briefly summarized in six main explanations of why vocational high school graduates go to university, according to previous studies (Yang, 2003; Hong, 2003; Lee, 2005; Hong, 2005): 1) those who entered vocational high school because their middle school performance was not good enough to get into general high school are still motivated to go to university rather than just to acquire the skills to obtain a job right after high school graduation as is the expectation for students at vocational schools; 2) those doing well at vocational high schools can have grades as good as those at general high schools, even though the vocational students could not compete with the general ones when both groups were at middle school; 3) they know

that society perceives university credentials more positively than practical skills; 4) they know that the labor market requires ever higher levels of education as credentialism grows in South Korea while the already very high average level of education continues to increase; 5) some can get into university because of a system of admitting students into colleges upon the special recommendations of high school principals; and 6) Korea has reestablished a screening system for university admissions for vocational high school students because of the country’s declining birth rate.

It is necessary to find out what factors accurately determine the decision of vocational high school graduates to enter university, rather to enter the labor market directly, on high school graduation. Such information will also help to provide advice to vocational high school graduates who plan to go on to higher education; to inform higher education institutions about vocational high school graduates’ preferences; and to enable higher education institutions strategically to share precise information with vocational high school students and graduates.

This study examines the factors determining whether vocational high school students in South Korea subsequently graduated from university and, if so, whether from 2-year or 4-year courses. There have been few empirical studies of this question, using high quality official data. This study uses data from the Korean Education and Employment Panel (KEEP). It confirms the results obtained by the most rigorous other study that used a different data source, the Korea Children and Youth Panel Survey (KCYPs), that the principal determinants are parental education and family income (Yoo, 2018). It goes beyond Yoo, however, to also determine the impact of the number of siblings and, crucially, to disaggregate the results by gender.

2. College Entrance of Vocational High School Students in Korea

Although vocational education’s main purpose is to enable the school-to-work transition based on training skilled workers, many Korean vocational high school graduates in fact go on to higher education rather than enter the labor market. This peaked in 2009 and has since moderated. Even so, there is still a high rate of enrollment rate in university among vocational high school graduates today (Figure 1).

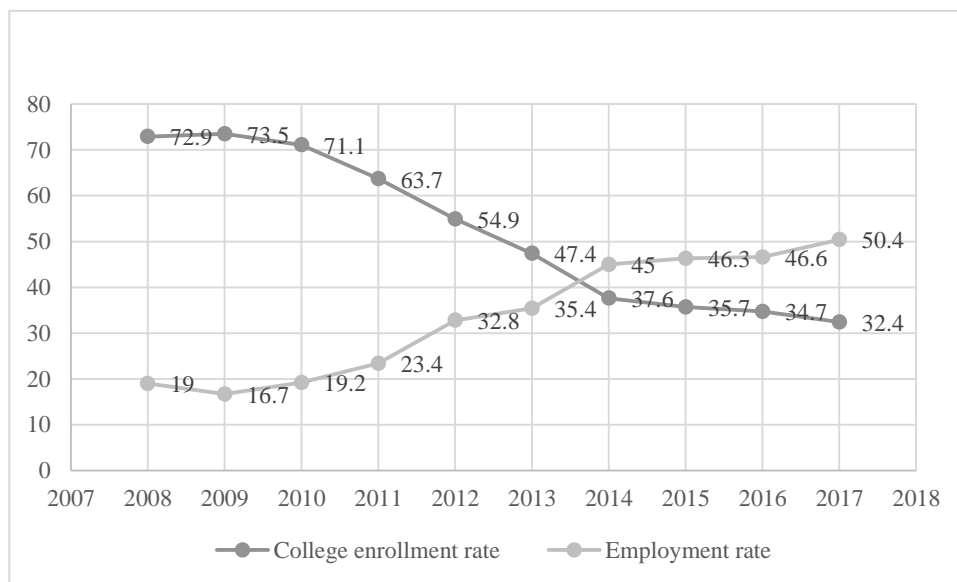


Figure 1. Career path of Vocational high school graduates

Source: Created by Author based on Korean Education Development Institute statistics (KEDI, 2018)

Note: Totals do not add to 100 because some young people are not in employment or education, including those who did not gain admission to university but are again preparing to do so.

For this reason, the vocational high schools have for two decades been recognized as educational institutions with two characteristics: both practical skills development and college entrance preparation, the latter like general high schools (Ahn & Lee, 2009). This duality is viewed negatively in Korea, even though it fits well with Becker’s (1964) well-known theory of human capital: an individual invests in education with the expectation that the investment will provide a benefit in the form of higher earnings. It is very helpful that vocational high schools support the possibility

of their students attending university; but it is also challenging in terms of human resource management of the skilled work force in South Korea.

There are very few systematic data analyses of higher education opportunities among vocational high school students in South Korea using Korean Education and Employment Panel Data (Kim & Shin, 2010; Chae, 2006; Choi, 2008). Most of these previous studies focus on family background and personal characteristics as factors influencing college planning by vocational high school graduates. Specifically, Kim and Shin (2010) found that female vocational high school graduates who have biological parents and high family income have a high probability of enrolling in higher education, though their study did not compare females with males. Chae (2006) also reported that household incomes have a great influence on college entrance for vocational high school graduates, and college enrollment is significantly higher if both parents are alive or have high educational backgrounds. In addition, vocational high school students with excellent academic achievements are more likely to choose college than to enter the labor force for employment, while work experience during school lowers this possibility. However, Chae did not look at gender differences. Such differences were explored by Choi (2008) who showed the importance of family background, especially the family's financial situation, for college attendance among vocational high school graduates. In addition, male students were more likely to go to college than female students. Males and females with experience of private tutoring were also more likely to go to college than those without private tutoring. In addition, while career conversations with parents increased the likelihood of going to college, the level of parental education did not have a significant effect. Despite this study's remarkable consistency with previous research, its findings are not able to predict what will happen after vocational high school graduation, as it uses survey data from when the responders were in the 3rd grade of high school.

Generally speaking, vocational high school students have less strong family backgrounds and weaker academic achievements than general high school students, according to previous studies of South Korea. Although a number of vocational high school graduates have entered college, previous research has shown that vocational high school graduates are disadvantaged in terms of the academic knowledge needed to enter college compared to general high school graduates. Moreover, those with weak school performance at middle and high school show limited aptitude for and interest in choosing to go to university (Kim & Phang, 2005; Kim & Byun, 2006; Chae, 2006). Byun and Kim (2012) established that vocational high school graduates are more likely to enter college, especially 4-year university courses, when their backgrounds include high parental educational attainment and also high spending on private tutoring (using 1st ~ 7th wave of Korean Education and Employment Panel (KEEP) data from the Korea Research Institute for Vocational Education and Training).

Most studies of the career decisions of vocational high school graduates have focused only on qualitative analysis of small local surveys of family and individual characteristics; and even the few data-based analyses ignored to examine the gender issue. Despite extensive research on the career decisions of vocational high school graduates using various methods and data, there is no study that uses appropriate data and analysis to compare differences between male and female students.

3. Data

The data were collected and maintained by the Korea Research Institute for Vocational Education and Training (KRIVET) using 11 years of Korean Education and Employment Panel (KEEP) tracing data. This study pooled the data in the 1st, 4th and 11th waves, and consists of 610 data samples who attended general (145 males and 306 females – the disparity mainly because males are required to do military service at age 20) and vocational (79 males and 80 females) high schools in the South Korea education system. There are 2 cohorts of the data showing individual status of 3rd-year middle and high school students at the start of the survey in the 1st wave (most are 15 and 18 years old if they do not repeat or accelerate academically, respectively). This data used only the 3rd-year middle school cohort to avoid the selection bias of only selecting high school students who are going to college. The 4th wave data shows their academic grade in the 3rd-year of high school, after 3-year data tracing for 3-year middle school students. The 11th wave data displays them at age 25, including information on their highest educational attainment, current job status, salary, and so on.

Table 1 reports the summary statistics, including the definition of independent and dependent variables for university choice analysis. The multinomial logit model (MLM) of this study measures higher education choice of outcome variable as one of three “degree” variables: zero denotes an individual did not enroll in 2-year or 4-year university but just completed high school; 1 indicates an individual completed 2-year university; and 2 completed 4-year university. Independent variables are essentially based on individual, household and regional information. The individual variables are as follows: “Gender” quantified as male = 1 and female = 0; “High school background”

specified as vocational high school graduates = 1 and general high school graduates = 0; “Teacher's assessment” implied student’s school performance on a capacity from 1 to 5 in the 3rd year of high school.

Table 1. Summary Independent Variables at University Choice

<i>Variable</i>	<i>Definition of variables</i>	<i>Obs.</i>	<i>Mean</i>	<i>Min</i>	<i>Max</i>
Degree (1)	Dependent variable (base outcome): high school graduates	610	0.22	0	1
Degree (2)	2-year university graduates	610	0.34	0	1
Degree (3)	4-year university graduates	610	0.44	0	1
Gender	if = 1/0, male / female	610	0.37	0	1
High school background	if = 1/0, Vocational / General high school	610	0.26	0	1
Teacher's assessment 1	Teacher's assessment at lower secondary education (lowest)	610	0.07	0	1
Teacher's assessment 2	Teacher's assessment at lower secondary education	610	0.24	0	1
Teacher's assessment 3	Teacher's assessment at lower secondary education	610	0.36	0	1
Teacher's assessment 4	Teacher's assessment at lower secondary education	610	0.21	0	1
Teacher's assessment 5	Teacher's assessment at lower secondary education (highest)	610	0.10	0	1
Father income	Father's monthly income (KR ₩10,000)	610	242.86	50	1200
Father lnW	Log of father's monthly income	610	5.37	3.91	7.09
Father's educational attainment 1	The father's educational attainment is less than upper secondary	610	0.54	0	1
Father's educational attainment 2	The father's educational attainment is upper secondary (base outcome)	610	0.23	0	1
Father's educational attainment 3	The father's educational attainment is more than upper secondary	610	0.23	0	1
Private tutoring	Private tutoring cost at lower secondary education in 2004 (KR ₩10,000)	610	24.08	1	200
Ln PT	Log of private tutoring cost at lower secondary level	610	0.71	0	5.29
Siblings	The number of siblings	610	1.04	1	2
Region (1: City)	Individual lives in Seoul at high school (base outcome): metropolitan cities	610	0.13	0	1
Region (2: Province)	Individual lives in near and relatively smaller than Seoul at high school: province-level divisions	610	0.30	0	1
Region (3: Town)	Individual lives in far from and smaller than Seoul at high school: municipal-level divisions	610	0.30	0	1
Region (4: Village)	Individual lives in farthest from and much smaller than Seoul at high school: sub municipal-level divisions	610	0.26	0	1

Source: Created by Author based on Korean Education & Employment Panel, Korea Research Institute for Vocational Education & Training (KRIVET)

Though the GPA would be a more precise measure of school achievement, KEEP had GPA data for only around 50% of students in its sample, hence this study uses teacher assessments instead of GPA. Household variables are: “Father lnW” represented a log of father’s monthly income generated by father’s monthly income in “Father income” variable.

“Father’s educational attainment” classified in three groups: less than upper secondary, upper secondary, more than upper secondary. “Private tutoring”, “Ln PT” and “Siblings” indicate the monthly cost of private tutoring, its log and number of siblings respectively. The “region” variable is categorized from region 1 to 4: where 1 is Seoul, the capital city of Korea; 2 is the region nearest to Seoul; 3 is a bit further from Seoul; and 4 is the furthest from Seoul. As Korea’s famous universities are almost all concentrated in Seoul, the region variable can be helpful in interpreting university choice.

4. Method

School choice has frequently been used to identify labor market outcomes as a result of education investment (Goldhaber, 1996; Hastings, et. al., 2005). Typically, choice is analyzed using binary models with only two objectives for discrete choices. The MLM estimation as well as the mixed logit model and the conditional logit (CL) model imply the well-known and independence from irrelevant alternatives (IIA) assumption (McFadden, 1974). IIA means, all else being equal, that an individual’s choice between two alternative outcomes is not affected by what other probabilities are available. The choice probability for individual characteristics i in terms of alternative j is independent from the error term in estimating Y_{ij} . For estimating the determinants of university choice, this study is employed the typical MLM estimation of school choice based on previous studies (Hosmer & Lameshow, 2000; Ogawa & Iimura, 2010).

The estimation equation can be denoted:

$$Y^*_{ij} = \alpha_i + \beta_{1j}individual_i + \beta_{2j}household_i + \beta_{3j}region_i + \varepsilon_{ij}$$

In the equation, Y^* refers to

- $Y_i = 0$, the base outcome of degree variable, if the individual is not enrolled in 2-year or 4-year university and is a high school graduate.
- $Y_i = 1$, if the individual is enrolled or was enrolled in 2-year university.
- $Y_i = 2$, if the individual is enrolled or was enrolled in 4-year university.

Similarly, in the equation, the dependent variables:

- *individual* term denotes information about the individual, including gender, high school background, teacher’s assessment on a scale from 1 to 5;
- *household* term variables indicate the individual’s household information, including father’s monthly income and educational attainment, the monthly cost of private tutoring per person, the number of siblings;
- *region* is the place where individual currently lives in 4 different size standards of areas;
- ε is an error term.

5. Results

This study starts with multinomial logit estimates of the determinants of the transition from secondary to tertiary education for all students together completing general and vocational high school, considering gender differences. This shows how the likelihoods of 2-year and 4-year university enrollments are affected by individual characteristics, family background, and regional factors.

Table 2 reports university choice analysis for all students, from both general and vocational high schools. Principally, the combination of individual characteristics and high school background determines higher education choices. Having a vocational high school background has a strongly negative and statistically significant effect on the probability of higher education enrollment, especially in 4-year university. A low level of father’s education has a negative effect on higher education choice, for both males and females, but this is not statistically significant. The only statistically significant result (10%) for low father’s education is for males who decide not to go to 2-year university. The father’s high income has a positive effect for both men and women but is not statistically significant except for going to 4-year university. The number of siblings has a negative effect on higher education choice, for both males and females and for all students together. The effect is stronger for males, but this is not statistically significant. There is no major regional effect, except, remarkably, that coming from region 3 (the second farthest distance from Seoul) has a negative effect for all and for both genders, but this is also not statistically significant.

Table 2. School Choice from High School to University

<i>Variables</i>	<i>All</i>		<i>Male</i>		<i>Female</i>	
	<i>2-year</i>	<i>4-year</i>	<i>2-year</i>	<i>4-year</i>	<i>2-year</i>	<i>4-year</i>
High school background	-0.172 (0.270)	-1.164*** (0.321)	0.0660 (0.409)	-1.735*** (0.627)	-0.483 (0.411)	-1.100** (0.445)
Teacher's assessment 2	0.107 (0.369)	0.465 (0.561)	-0.0492 (0.490)	-0.905 (1.055)	0.0491 (0.692)	0.650 (0.829)
Teacher's assessment 3	0.204 (0.393)	1.354** (0.562)	0.168 (0.534)	1.091 (0.900)	-0.0800 (0.740)	1.173 (0.867)
Teacher's assessment 4	0.858* (0.488)	2.179*** (0.627)	0.222 (0.703)	0.413 (1.014)	1.018 (0.882)	2.673*** (0.982)
Teacher's assessment 5	0.283 (0.819)	3.253*** (0.814)	-0.648 (1.379)	2.015* (1.203)	0.395 (1.340)	3.415** (1.343)
Father's educational attainment 1	-0.354 (0.276)	-0.305 (0.297)	-0.765* (0.400)	-0.600 (0.497)	0.0802 (0.430)	0.102 (0.440)
Father's educational attainment 3	-0.609* (0.311)	-0.0818 (0.301)	-0.484 (0.441)	0.0565 (0.506)	-0.562 (0.507)	0.0156 (0.485)
Father income	0.302 (0.262)	0.514* (0.282)	0.455 (0.440)	0.620 (0.504)	0.253 (0.364)	0.539 (0.359)
Private tutoring	0.00130 (0.185)	0.121 (0.208)	0.0260 (0.256)	0.0171 (0.331)	0.146 (0.290)	0.344 (0.313)
Siblings	-0.506 (0.482)	-0.556 (0.526)	-0.581 (0.665)	-0.839 (0.884)	-0.189 (0.972)	-0.0189 (0.975)
Region_2	-0.0637 (0.382)	0.575 (0.407)	0.519 (0.537)	0.839 (0.648)	-0.813 (0.724)	0.0404 (0.730)
Region_3	-0.348 (0.365)	-0.192 (0.399)	-0.365 (0.496)	-0.359 (0.629)	-0.645 (0.702)	-0.450 (0.716)
Region_4	0.0163 (0.402)	0.546 (0.430)	0.692 (0.536)	0.825 (0.650)	-1.072 (0.710)	-0.320 (0.729)
Constant	-0.485 (1.560)	-3.119* (1.698)	-1.947 (2.591)	-3.317 (2.899)	0.282 (2.397)	-3.416 (2.478)
Observations	610	610	224	224	386	386

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

Note: the base outcome of categorical variables is Teacher's assessment 1 in lowest achievement in 5 level

assessment, Father's educational attainment 2 means having high school degree from 1: lower than high school to 3: higher than high school, and Region_1 means the metropolitan cities among 4 regions respectively.

Table 3. School Choice among General High School Graduates to University

<i>Variables</i>	<i>Male (Gen.)</i>		<i>Female (Gen.)</i>	
	<i>2year</i>	<i>4year</i>	<i>2year</i>	<i>4year</i>
Teacher's assessment 2	1.166 (1.384)	-0.453 (1.328)	2.456** (1.247)	1.374 (1.485)
Teacher's assessment 3	1.055 (1.394)	1.635 (1.156)	2.184* (1.203)	1.818 (1.453)
Teacher's assessment 4	1.380 (1.395)	1.089 (1.225)	3.632*** (1.335)	3.695** (1.559)
Teacher's assessment 5	0.328 (1.834)	2.587* (1.386)	2.500 (1.661)	3.881** (1.783)
Father's educational attainment 1	-0.733 (0.546)	-0.614 (0.561)	0.785 (0.672)	0.933 (0.656)
Father's educational attainment 3	-0.342 (0.546)	0.305 (0.556)	-0.673 (0.577)	-0.0979 (0.531)
Father income	-0.199 (0.583)	0.0308 (0.512)	0.277 (0.489)	0.466 (0.472)
Private tutoring	0.168 (0.349)	0.260 (0.395)	0.528 (0.412)	0.796* (0.427)
Siblings	-0.686 (0.971)	-0.733 (1.019)	13.59*** (1.443)	14.11*** (1.182)
Region_2	1.183* (0.716)	1.018 (0.777)	-0.498 (0.880)	0.267 (0.879)
Region_3	0.0504 (0.641)	-0.312 (0.678)	-0.211 (0.867)	-0.314 (0.876)
Region_4	0.763 (0.665)	0.843 (0.697)	-0.915 (0.905)	-0.239 (0.909)
Constant	-0.0810 (3.528)	-1.657 (3.168)	-17.35*** (3.467)	-19.37*** (3.718)
Observations	145	145	306	306

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

Note: the base outcome of categorical variables is Teacher's assessment 1 in lowest achievement in 5 level assessment, Father's educational attainment 2 means having high school degree from 1: lower than high school to 3: higher than high school, and Region_1 means the metropolitan cities among 4 regions respectively.

Table 3 shows university choice in general high school graduates that the teacher's assessment is most important determinant of university choice for general high school graduates. The higher the teacher's assessment, the more likely the student will go to 4-year university. Among females, those with assessment levels below 4 are more likely go to 2-year university, and those with levels of 4 and above are more likely go to the 4-year university, these results being substantially and statistically significant. While the male group is also more likely go to 4-year university, the

probability is not statistically significant, except for the very weak effect of assessment level 5. In terms of household characteristics, unexpectedly, father's education and income do not affect the decision about type of higher education among general high school graduates, both male and female. Private tutoring has a positive effect on university choice, but it is statistically not significant except for the 4-year university choice of females. The number of siblings has a positively important effect on female university enrolment in both 2-year and 4-year university, but the effect is negative and not statistically significant for males. As regards regional effects, the only significant (5%) effect is that the male group is more likely to go to 2-year university in the 2nd biggest city.

Table 4. School Choice among Vocational High School Graduates to University

<i>Variables</i>	<i>Male (Voc.)</i>		<i>Female (Voc.)</i>	
	<i>2year</i>	<i>4year</i>	<i>2year</i>	<i>4year</i>
Teacher's assessment 2	-0.459 (0.658)	0.00865 (1.632)	-0.853 (0.876)	0.944 (1.210)
Teacher's assessment 3	0.000402 (0.794)	2.196* (1.240)	-1.406 (1.036)	1.473 (1.321)
Teacher's assessment 4	-18.04*** (1.240)	-18.20*** (1.517)	-1.585 (1.408)	1.740 (1.879)
Teacher's assessment 5				
Father's educational attainment 1	-0.749 (0.588)	-0.788 (1.547)	-0.894 (0.692)	-0.797 (0.861)
Father's educational attainment 3	-0.686 (0.894)	-16.02*** (1.287)	-0.693 (1.157)	0.519 (0.961)
Father income	1.525** (0.737)	3.637* (2.204)	0.0986 (0.713)	1.655* (0.872)
Private tutoring	-0.149 (0.464)	-1.155 (0.710)	-0.163 (0.410)	-0.604 (0.546)
Siblings	-0.888 (0.797)	-14.62*** (1.193)	-0.249 (1.158)	-14.96*** (1.065)
Region_2	-0.619 (1.129)	16.02*** (1.614)	-1.924* (1.109)	0.0658 (1.474)
Region_3	-1.562 (1.186)	14.29*** (1.566)	-2.229** (1.108)	-0.0647 (1.398)
Region_4	0.00391 (1.185)	14.56*** (1.889)	-1.910* (1.071)	-0.764 (1.491)
Constant	-5.412 (4.024)	-19.23 (12.33)	3.866 (4.076)	7.140* (4.228)
Observations	79	79	80	80

Robust standard errors in parentheses

***p<0.01, **p<0.05, *p<0.1

Note: the base outcome of categorical variables is Teacher's assessment 1 in lowest achievement in 5 level assessment, Father's educational attainment 2 means having high school degree from 1: lower than high school to 3: higher than high school, and Region_1 means the metropolitan cities among 4 regions respectively.

Table 4 estimates the determinants of higher education attendance among vocational high school graduates, comparing gender differences. Interestingly, those males who have the highest teacher assessment (level 4) are not likely to go to university unlike general high school graduates, a strong and statistically significant effect. Moreover, those males with a lower teacher's assessment (level 3) are more likely to go to 4-year university, a statistically significant result. Females tend to go to 4-year university rather than 2-year university regardless of their school performance, but this is not statistically significant. While a low level of father's education is associated with not going to university for both males and females, this is not statistically significant; unexpectedly, however, a high level of father's education is strongly negatively associated with 4-year university choice for males. Among females, there seems no correlation between father's education and university choice. Father's monthly income is positively correlated with 2-year and 4-year university choice, at statistically significant levels for both males and females, with the exception of 2-year university choice by females. The number of siblings negatively affects individuals in their choice of higher education, especially at 4-year university, for both males and females, with a significance level of 5%. The regions that are smaller than metropolitan cities are strongly associated with 4-year university choice for males, and negatively associated with 2-year university choice of females.

6. Discussion and Conclusion

In the past, the education of Koreans was accompanied by dramatic economic growth and explosive educational demand, leading to remarkable educational expansion. This resulted in educational and social inequality, stemming from the differences between general and vocational education at the high school level, and between 2-year and 4-year universities at the higher education level (Chang, 2000; Phang & Kim, 2002; 2003; Park, 2004).

Previous studies have mainly highlighted the links between university attendance and family background, and academic achievement. According to these studies, vocational high school students are more likely to go to 2-year university than 4-year university in South Korea, and if students enter 4-year university from vocational high school, they are more likely to have had a higher level of achievement in middle school and a privileged family background. Furthermore, students who are motivated to learn skills linked to their targeted occupation and so enter vocational high school, are less likely to make a schooling decision to enter higher education than students who are not motivated and have no target for their future occupation (Chae, 2009; Byun & Kim, 2012; Kim, 2013).

This study examines the factors determining whether vocational high school students in South Korea subsequently graduated from university and, if so, whether from 2-year or 4-year courses. The results show the multinomial logit model estimates separately, focusing on the determinants of higher education choice among general and vocational high school graduates, including gender differences. Tables 3 and 4 therefore show an overlap with the dependent variables in Table 2, except for high school background as an independent variable which is for both general and vocational high school graduates. As noted in previous studies, the proportion of general high school students entering university is usually more than 70% (Ku & Kim, 2015), and these are those who come from relatively better family backgrounds, financially and socially (Kim & Phang, 2005; Kim & Byun, 2006; Chae, 2006). However, this study's findings slightly differ from previous studies in that those who graduated from general high school with superior academic performance prefer to go to 4-year university, but father's income did not affect this choice between 2 and 4-year university, even though it might be expected that having to pay tuition fees compared to income might have affected the choice. Moreover, unexpectedly, privileged family backgrounds such as father's higher education also did not affect the decision to enter 4-year university (Table 3). But, for vocational high school graduates, higher academic achievement and father's monthly income did have a major effect, a quite different finding from previous studies. It is connected to the result that the number of siblings strongly negatively affects going to 4-year university, as that would increase the financial burden on the family. Thus, vocational high school graduates' university choice is not solely influenced by school achievement or parental educational attainment but also by father's income and, related, the number of siblings (Table 4). This could also explain previous findings that vocational high school graduates' financially weak situations result in them choosing 2-year university rather than 4-year university. Therefore, the most important determinant for vocational high school graduates to enter 4-year university is the family's financial condition. There are also regional effects of vocational high school on university attendance. In terms of gender differences, males seem keen to enter 4-year universities with lower reputations as that is relatively not as difficult as entering universities in the major metropolitan cities.

These findings support the conclusion that persistent low economic growth caused the high youth unemployment rate, increasing demand for high skilled workers with high levels of education as well as creating a big wage gap between high school graduates and university graduates. This then resulted in South Korean vocational high school graduates deciding to pursue higher education (Byun & Kim, 2012).

The major higher education policy implication for vocational high school graduates might be to provide financial support to vocational high school graduates, such as tuition fee waivers, scholarships and other opportunities. Social adjustment may also be needed, including on the demand side of labor market, where employers need to evaluate applicants based on their ability to do the work, rather than evaluating them according to the highest level of their diploma. This might help to improve the vocational high school enrollment rate and at the same time to reduce labor shortages in small and medium sized enterprises.

Lastly, this study was limited to unbalanced data observation numbers between genders among general high school graduates and in the total number of samples between general and vocational high school. It is technically difficult to adjust the data balance as males have a duty of two years national military service at age 20 years - and males are thus mostly going to military service right after finishing their first year at university. Analysis using appropriate data balance should certainly be considered for further study.

Acknowledgements

This paper draws on my Ph.D. dissertation at Kobe University. I am sincerely grateful to my academic advisor, Prof. Keiichi Ogawa, for his all support during my doctoral course. I also thank Profs. Masahiro Chikada and Kazufumi Yugami for their infinite patience and guidance as I completed my dissertation. I would also like to thank the Kobe-Sugahara Scholarship Foundation for financial support to complete my doctorate.

References

- Ahn, S. Y. & Lee, K. S. (2009). The Factors Associated with Youths' Career Decision Making at the Secondary Education Level and Its Effect. *Journal of Future Oriented Youth Society*, 6(4), 81-99. Retrieved from <http://digital.kyobobook.co.kr/digital/article/articleDetail.ink?selectedLargeCategory=006&barcode=4050025287937>
- Becker, G. (1964). *Human Capital*. Chicago: The University of Chicago Press.
- Byoun, S. Y. (2017). An Exploration on Characteristics and Student Engagement Types of College Students Graduating from Vocational High Schools. *Korean Journal of Educational Administration*, 35(4), 145-172. Retrieved from http://www.keas.or.kr/0070/upload/journal_data/07.%20%EB%B3%80%EC%88%98%EC%97%B0.pdf
- Byun, S. Y. & Kim, K. K. (2012). Determinants of College Attendance among Vocational High School Graduates. *The Journal of Korean Education*, 39(2), 79-107. Retrieved from https://www.researchgate.net/publication/283423554_jeonmungo_jol-eobsaeng_daehag_jinhag_gyeoljeong-yoin_Determinants_of_college_attendance_among_vocational_high_school_graduates_in_South_Korea
- Chae, C. K. & Chung, J. H. (2009). *Pre-Employment Vocational Education and Training in Korea*. World Bank, Working Paper No. 0921. Retrieved from <http://documents.worldbank.org/curated/en/644501468045004776/Pre-employment-vocational-education-and-training-in-Korea>
- Chae, C. K. (2006). *Career choice of vocational high school graduates*. Proceedings of the 2nd Korean Education and Employment Panel conference, 447-461, Seoul: Korea Research Institute for Vocational Education & Training (KRIVET).
- Chae, C. K. (2006). *Career Decision of Vocational Highschool Graduates*. Proceedings of the 2nd Academic Competition of Korea research Institute for Vocational Education & Training, Seoul: Korea Research Institute for Vocational Education & Training (KRIVET).
- Chang, S. S. (2000). Inequality of Educational Opportunity in Korea - The Effects of Family Background on Educational Attainment. *Korean Journal of Sociology*, 34, 671-708. Retrieved from <http://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE00900961>
- Choi, D. (2008). College plans of vocational high school graduates. *Proceedings of the 4th Korean Education and Employment Panel conference*, 89-111, Seoul: Korea Research Institute for Vocational Education & Training (KRIVET).
- Choi, D. S. (2008). *Higher Education Decision of Vocational Highschool Graduates*. Proceedings of the 4th Academic Competition of Korea research Institute for Vocational Education & Training, Seoul: Korea Research Institute for Vocational Education & Training (KRIVET).
- Eom, D. W. (2007). The Determinants of Promotion Inside a Korean Large Firm - An empirical study of personnel

- data around IMF financial crisis. *Quarterly Journal of Labor Policy*, 7(1), 173-201. Retrieved from <http://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE01562107>
- Goldhaber, D. (1996). Public and Private High Schools: Is School Choice an Answer to the Productivity Problem? *Economics of Education Review*, 15(2), 93-109. [https://doi.org/10.1016/0272-7757\(95\)00042-9](https://doi.org/10.1016/0272-7757(95)00042-9)
- Hastings, P. D. (2005). Coping strategies in mothers and fathers of preschool and school-age children with autism. *The International Journal of Research and Practice*, 9(4), 377-391. <https://doi.org/10.1177/1362361305056078>
- Hong, G. T. (2003). *A Study on Selecting Vocational Courses of the Industrial High school Students* (Master thesis, Chonbuk National University, Jeollabuk-do, South Korea). Retrieved from <http://www.ndsl.kr/ndsl/search/detail/article/articleSearchResultDetail.do?cn=DIKO0008998508>
- Hong, J. G. (2005). *The Current State and Its Improvement of Career Guidance in Vocational High Schools* (Master thesis, Incheon National University, Incheon, South Korea). Retrieved from http://www.riss.kr.oca.korea.ac.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=f387fc72f92185abffe0bdc3ef48d419
- Hosmer, D. & Lemeshow, S. (2000). *Applied Logistic Regression*. 2nd ed. New York: Wiley-Interscience.
- Keum, J. H. (2002). Promotion and Wage in the Internal Labor Market: Sexual Differences. *Korea Journal of Population Studies*, 25(1), 181-211. Retrieved from https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE00756912&language=ko_KR
- Kim, A. K. & Shin, D. J. (2010). *Choosing higher education or employment of young women adults-Korean technical high school graduates*. Proceedings of the 5th Korean Education and Employment Panel conference, 141-158, Seoul: Korea Research Institute for Vocational Education & Training (KRIVET).
- Kim, K. H. & Phang, H. N. (2005). Social class and gender differentials in Korean and Japanese higher education: A comparative study. *Korean Journal of Sociology*, 39(5), 119-151. Retrieved from <http://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE00895583>
- Kim, K. K. & Byun, S. Y. (2006). Determinants of children's educational transition in Korea. *Korean Journal of Sociology of Education*, 16(4), 1-27. Retrieved from <http://scholar.dkyobobook.co.kr/searchDetail.laf?barcode=4050026582781>
- Kim, S. G. (2007). A Study on the Reasons for College Entrance of Vocational High School Students and Cognition of Entrance Strategies for Colleges: With Interview of Technical High School Students. *The Journal of Humanities*, 34(2), 27-53. Retrieved from <https://www.kci.go.kr/kciportal/ci/sereArticleSearch/ciSereArtiView.kci?sereArticleSearchBean.artiId=ART001205950>
- Kim, S. N. (2013). A Study on the Relationship between Education and Subject Mismatch and Labor Market Outcomes of Workers graduated from Vocational High School. *The Journal of Vocational Education Research*, 32(4), 93-111. <https://www.happycampus.com/paper-doc/12312499/>
- Korean Education Development Institute. (2018). *Statistical Yearbook of Education 2018*. Retrieved from <https://kess.kedi.re.kr/publ/view?survSeq=2018&publSeq=2&menuSeq=3894&itemCode=02&language=en>
- Ku, I. H. & Kim, J. E. (2015). Gap in College Entrance: Role of Family Income. *Social Welfare Policy*, 42(3), 27-49. Retrieved from <http://kiss.kstudy.com/thesis/thesis-view.asp?key=3355408>
- Lee, J. H. (2013). The Relationship of Career Identity and Career Preparation Behavior of University Students: The Mediating Effects of Self-determination and Career Maturity. *Journal of Learner-Centered Curriculum and Instruction*, 13(3), 133-154. Retrieved from <http://scholar.dkyobobook.co.kr/searchDetail.laf?barcode=4010026145906>
- Lee, S. S. (2005). *A study On the College Entrance Guidance Devices for Commercial High Schools According to the Changed College Entrance Test System* (Master thesis, Chonnam National University, Gwangju, South Korea). Retrieved from http://www.riss.kr.oca.korea.ac.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=c2b47106240121e0ffe0bdc3ef48d419
- McFadden, D. L. (1974). *Conditional Logit Analysis of Qualitative Choice Behavior*. *Frontiers in Econometrics*, ed. P. Zarembka, 105-142. New York: Academic Press.

- Ogawa, K. & Iimura, K. (2010). Determinants of Access and Equity in Tertiary Education: The Case of Indonesia. *Excellence in Higher Education*, 1(1), 3-22. ISSN 2153-9669, Retrieved from <http://ehe.pitt.edu/ojs/index.php/ehe/article/view/12/6>
- Paik, S. & Shim, W. J. (2017). Vocational Students' Career Maturity and the Factors Associated with Career Maturity in Comparison to those Graduating from General High Schools. *Asian Journal of Education*, 18(2), 315-338. Retrieved from <http://s-space.snu.ac.kr/handle/10371/145281>
- Park, H. J. (2004). *Educational expansion and inequality in Korea*. *Research in Sociology of Education*, 14, 33-58. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.22.8356&rep=rep1&type=pdf>
- Phang, H. N. & Kim, K. H. (2002). Opportunity and Inequality: Educational Stratification in Korea. *Korean Journal of Sociology*, 34(4), 193-222. Retrieved from <http://www.dbpia.co.kr/Article/NODE00933329>
- Phang, H. N. & Kim, K. H. (2003). Trends and Differentials in Educational Stratification in Korea. *Korean Journal of Sociology*, 37(4), 31-65. Retrieved from <https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE00890218>
- Yang, S. N. (2003). *A study on the entrance into the university and the basic ability of the technical high schools* (Master thesis, Inha University, Incheon, South Korea). Retrieved from http://www.riss.kr.oca.korea.ac.kr/search/detail/DetailView.do?p_mat_type=be54d9b8bc7cdb09&control_no=03d40a529c2fb4c9
- Yoo, J. S. (2018). The analysis of vocational high school admission and their employment factors focus on the implications of the easing of youth unemployment. *KERI Insight*, 18(10). Retrieved from http://www.keri.org/web/www/research_0201?p_p_id=EXT_BBS&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&_EXT_BBS_struts_action=%2Fext%2Fbbs%2Fview_message&_EXT_BBS_sCategory=&_EXT_BBS_sKeyType=&_EXT_BBS_sKeyword=&_EXT_BBS_curPage=1&_EXT_BBS_optKeyType1=&_EXT_BBS_optKeyType2=&_EXT_BBS_optKeyword1=&_EXT_BBS_optKeyword2=&_EXT_BBS_sLayoutId=0&_EXT_BBS_messageId=355354