A Social Ladder or a Glass Floor? The Role of Higher Education in Intergenerational Social Mobility: Empirical Evidence from South Korea

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Though various measures of mobility rate for colleges, e.g., bottom-to-top mobility rate, status maintenance rate, and middle-class mobility rate, have been introduced, they have rarely been reviewed together to see the whole picture of intergenerational mobility, particularly in non-Western societies. This paper fills this gap and characterises mobility rates for 17 different college tiers in South Korea using the Graduates Occupational Mobility Survey for 37,552 graduates from 2007 to 2010. It documents two main results. First, mobility rates are higher for males than for females in all three measures, indicating colleges in South Korea are less effective as a social ladder for females. Second, many selective colleges are more likely to play a role as a glass floor than a social ladder due to their lower low-income access, and 'selective public' colleges are the engines of upward social mobility for students from the bottom three quintiles. Though people believe education is the single greatest hope to achieve upward social mobility, these findings cast doubt on the idea that college attendance alone can promote social mobility. This paper does not necessarily identify causal relationships that can be manipulated to improve mobility rates; however, it documents various patterns of interest to policymakers.

Keywords: intergenerational social mobility; higher education; bottom-to-top mobility rate; status maintenance rate; middle-class mobility rate

Introduction

Higher education has been often viewed as a social ladder, and people in South Korea have shown a strong passion for education and invest heavily in children's education to provide them with opportunities to achieve a better socioeconomic status. However, inequality in access to colleges could limit colleges' ability to encourage intergenerational mobility or even make colleges the

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central mechanism to reproduce social inequalities (Chetty et al., 2017). Much literature has indeed shown that colleges do not necessarily play a role as a social ladder, helping students from poorer family backgrounds have a better socioeconomic status than their parents (e.g., McKnight, 2015; Bukodi & Goldthorpe, 2018). Rather, colleges could play a role as a glass floor, protecting students with modest skills and ability but from richer family backgrounds from slipping down (Reeves & Howard, 2013).

Since Raj Chetty and his team published a paper, titled 'Mobility Report Card', in 2017, many scholars, particularly in Western societies, have used the concept of mobility rates to empirically show which colleges contribute the most to intergenerational social mobility (e.g., Britton et al., 2019). Such attempts have risen to great prominence since they not only examine the role of education in mediating the influences of social origins on the social destination as has been reviewed by an impressive body of literature (e.g., Blau & Duncan, 1967; Blanden & Macmillan, 2014; Gregg et al., 2017) but show the actual social mobility outcomes for individual colleges, taking into account both *access* and *success* rates of those from the most disadvantaged family background. The 'bottom-to-top' mobility rate is defined as the fraction of students who come from the bottom quintile of the income distribution and end up in the top quintile (Chetty et al., 2017). Besides the bottom-to-top mobility rate, various forms of mobility rates—e.g., middle-class mobility and status maintenance rates—have recently been introduced to examine the role of individual colleges in intergenerational social mobility.

Despite the prominence of mobility rates in the field, little research has empirically examined the mobility rates for colleges in non-Western societies, motivating further research in non-Western contexts. Unlike the United States or the United Kingdom where the information on the outcomes of graduates, e.g., wages and career paths, from individual higher education institutions is mostly available to the public to help them make decisions on their college attendance, such information has rarely been provided to the public in South Korea due to its potential adverse effects on the stratified higher education system. In this paper therefore, with the information available[†], I follow the existing literature estimating various types of mobility rates for colleges, bring them together

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[†] The data that support the findings of this study are available on request from the Korean Research Institute for Vocational Education and Training (KRIVET). Some parts of the data, e.g., college name, are not publicly available due to their containing information that could compromise the privacy of research participants and institutions.

as a comprehensive range of empirical evidence to build a picture of intergenerational social mobility, and examine if colleges indeed play a role as a social ladder in society as has been believed. Social mobility is often used to refer to the ability of individuals from disadvantaged backgrounds to move up in the world, akin to the notion of equality of opportunity (Crawford et al., 2011). In this paper, following the focus on relative mobility in more advanced economies, I defined 'social mobility' as relative income mobility, measuring the life chances of children given their parents' position in the income distribution in childhood (Blanden & Macmillan, 2014).

Trends of Social Mobility in South Korea

The majority of people in South Korea have a pessimistic view of the possible upward social mobility that their children can achieve. For instance, pessimistic expectations among household heads in their 30s on their children's upward social mobility, 51.5 per cent, outweighed optimistic views, 35.9 per cent, in 2013 (Kim, 2014). Despite the pessimistic views on social mobility, empirical evidence reveals a rather different picture, and South Korea has experienced an average level of relative income mobility among OECD countries (OECD, 2018; Chung et al., 2020).

In order to understand the gap between the public's general perception of social mobility—i.e., beliefs about the likelihood of moving up and down the socioeconomic ladder—and the actual social mobility index, a review of the concepts of absolute and relative mobilities is merited. In contrast to the concept of relative mobility, which indicates the relative chances of individuals from different socioeconomic backgrounds moving up and down the income or social ladder, absolute mobility simply considers whether adults tend to have higher incomes than their parents did at the same age with similar work experiences (Reeves & Venator, 2014; Eliot Major & Machin, 2020).

The perception of worsening social mobility is no doubt associated with trends in absolute mobility (Kye & Hwang, 2016). The possibility of absolute mobility has fallen due to the changes in the industrial structure allowing the rate of increase in white-collar and professional jobs (Chung et al., 2020). A college degree is less promising as a route to high earnings due to the rapid expansion of higher education. Further, a large college wage premium tends to be earned only by graduates from a few selective universities in the capital city, *Seoul*, and parental income is highly correlated

with the choice of college. In the given situation therefore, younger people have a much more pessimistic expectation of their children's upward social mobility compared with older generations that experienced high absolute social mobility (Kim, 2014).

Although the current trend of relative social mobility in South Korea is not as bad as the public fear, there still exists a strong positive relationship between parental income and children's earnings (e.g., Jang, 1999; Nam, 2008; Yeo, 2008; An & Jeon, 2008; Choi & Min, 2015). It is important to note that such income persistence has gradually increased at the top and bottom of the income distribution in South Korea, along with Austria, Spain, the Netherlands, and the United States, which is likely to worsen intergenerational social mobility (Corak, 2013; OECD, 2018).

Conceptual Frameworks

Research on the role of higher education in intergenerational social mobility dates back to the early 1960s within both economics and sociology (Duncan & Hodge, 1963; Atkinson & Jenkins, 1984). Models suggested by Blau and Duncan (1967) and Becker and Tomes (1986) place education as the principal mechanism, i.e., human capital theory, through which either advantage or disadvantage is passed from one generation to the next (Blanden & Macmillan, 2014). Human capitalists suggest that the greater family income allows parents to invest more in their children's education, and as a result, children from richer families, on average, acquire higher educational attainment, leading to higher earnings in the labour market (Becker, 1964; Becker & Tomes, 1986). It is therefore obvious that the education system, particularly higher education, plays a pivotal role in either improving or worsening intergenerational social mobility. Higher education will be the meritocratic route for the most able students to become the highest income earners in the labour market if and only if access and the returns to higher education are equal regardless of individuals' family background (Blanden & Macmillan, 2014).

Since Blau and Duncan (1967) focused upon the extent to which inherited status determines the social fate of individuals, a sizeable literature in the field has examined the relationship between social origins, education, and social destinations (e.g., Ishida et al., 1995; Breen & Goldthorpe, 2001). Unfortunately, however, it still remains unclear whether a secular or cross-national tendency is present for the association between family background and individuals' educational

attainment to weaken and/or the relationship between individuals' education and the labour market outcome to strengthen, which indicates a more meritocratic and mobile society (Goldthorpe, 2014). Hence, it becomes significant to review the actual social mobility rates for individual institutions to provide valuable information for both policymakers and students. The aim of this paper is therefore to examine if colleges provide individuals with the equality of opportunities to move up the earnings distribution regardless of their family backgrounds and to stimulate the policy debate in this area, particularly in non-Western contexts, namely South Korea.

Existing literature

This work will contribute to significant literature that has suggested a major impact of higher education on intergenerational social mobility. I focus on the South Korean graduate labour market, though findings are also relevant to the large literature in the Western contexts, which has examined the mobility rates for individual colleges (e.g., Chetty et al., 2017; Britton et al., 2019).

Until the 1990s, higher education played a pivotal role in promoting social mobility as suggested in Blau and Duncan's model (Blau & Duncan, 1967; Kim, 2014). However, since the 2000s, a sceptical view on the role of higher education in intergenerational social mobility has emerged globally, and a strong positive relationship between parental socioeconomic status and children's education has been highlighted (Reeves & Howard, 2013; McKnight, 2015). With this sceptical view on the role of higher education in social mobility, the concept of mobility rates was first introduced in the United States in 2017. Chetty et al. (2017), for instance, have revealed that rates of upward mobility differ substantially across colleges due to the heterogeneity in low-income access. Overall, only 1.7 out of 100 graduates in the United States, on average, came from a household at the bottom quintile and reached the top quintile in the earnings distribution (Chetty et al., 2017). In the United Kingdom, not only the best institutions but the best courses encouraging social mobility have been examined, and it is clear that some subjects, e.g., medicine and economics, are more likely than others to provide a pathway for poorer students to achieve very high earnings (Britton et al., 2019).

Though mobility rates for individual colleges and subjects have widely been examined in the Western contexts, such empirical analyses have rarely been conducted in South Korea mainly due

to data limitations and confidentiality issues. A few studies have recently tried to estimate the mobility rates for colleges in South Korea (e.g., Lee & Choi, 2020); however, they used wage information a year after college graduation, which is arguably too soon to determine the long-run impact of a college degree. In economics and sociology, it is often argued that wage information should be collected at an older age (at least age 35) to provide a more stable and robust analysis (Goldthorpe, 1980). Further, the previous study focused primarily on the bottom-to-top mobility and status maintenance rates for students from the bottom and the top quintile income families (e.g., Lee & Choi, 2020). Those measures are important, but they are not the whole story. It is also very important to consider the prospects for students from a broader range of income distribution (Reber & Sinclair, 2020). This paper fills this gap by presenting evidence on three different mobility rates for colleges in South Korea as well as identifying the statistical significance of the mobility rates with various control factors.

Methodology

Data

The Graduate Occupational Mobility Survey (GOMS) is the largest short-term panel survey of a representative sample of South Korean college graduates. It uses graduates of two-year or four-year colleges as its population, and the first wave of data was collected in 2005 with 25,000 subjects, approximately five per cent of the corresponding population. Among 13 different waves of the survey from 2005 to 2017, the ones targeting college graduates of 2007, 2008, 2009, and 2010 provide the most meaningful earnings information since they included two sets of earnings data, a year and three years after graduation. The dataset comprises anonymised individual-level data on individuals' higher education experiences and labour market outcomes, as mainly measured by earnings. It also provides information on family background, including parental income, which is a central focus of the analysis.

Sample

In this particular study, the surveys targeting college graduates of 2007, 2008, 2009, and 2010 were used. The sample was restricted to those who entered college no earlier than 1994 and earned at least the legal minimum wage in the corresponding years. Graduates who entered college before 1994 were considered as outliers or measurement errors and excluded from the analysis. Hence,

the usable sample is 37,552 individuals who provided valid earnings information three years after graduation. The targeted individuals were age 29 or 30 when the second wage information was collected, and it might be argued that this stage of life is still relatively early to assess the career path of individuals. Given the data limitations however, using the wage information three years after graduation is still an improvement on previous works.

Main variables

Parental income and graduates' earnings

The GOMS contains a measure of parental income in the banded form at the time students entered college. It does not include high-quality administrative data on parental income. Instead, respondents were asked to recall retrospectively the information. A continuous parental income measure was generated by fitting the deflated median values for each band based on the college entrance year and using national consumer price indices. The natural log of parental income measure is used.

The earnings information for college graduates of 2007, 2008, 2009, and 2010 was used to take into account more stable earnings data three years after graduation at age 29 or 30. Those four waves of the GOMS data were combined and deflated using national consumer price indices. The graduates' earnings measure is also logged, and individuals with earnings less than the legal minimum wage in the corresponding years were excluded from the sample. This is because those below this threshold and hence excluded from the sample are likely to be part-time workers or unemployed, and the data were not sufficiently rich to incorporate the reasons why individuals had a part-time job in their late 20s, e.g., further study or unemployed. As such, conclusions drawn from this analysis may represent an overestimation of the success rates for each college group. If the results demonstrate some mobility outcomes for each college group, then the situation for the groups with lower mobility outcomes is likely to be much worse than the one estimated here.

College groups

Calculating mobility rates for each and every college is not possible due to the sensitivity of disclosing colleges' performance data. For the analysis therefore, I followed as closely as possible the groupings used by Lee and Choi (2020). Colleges were first divided into eight different groups

based upon college prestige and type. Those groups were divided further into 17 different groups by location. It should be noted that Lee and Choi (2020) did not provide any individual college names in each college group. Despite the same college grouping method, the colleges within each college group may therefore slightly differ, making direct comparisons between this analysis and Lee and Choi (2020) difficult.

Analytical Approach

A two-stage quantitative approach to analysis was used in this study. Stage 1 involves descriptively examined three different mobility rates for 17 college groups. The second stage of the analysis puts emphasis on establishing the statistical significance of the success rates measured for the bottom-to-top mobility rate as well as gender differences in the influences of family economic status on graduates' wages.

Figure 1. Three different concepts of mobility rates
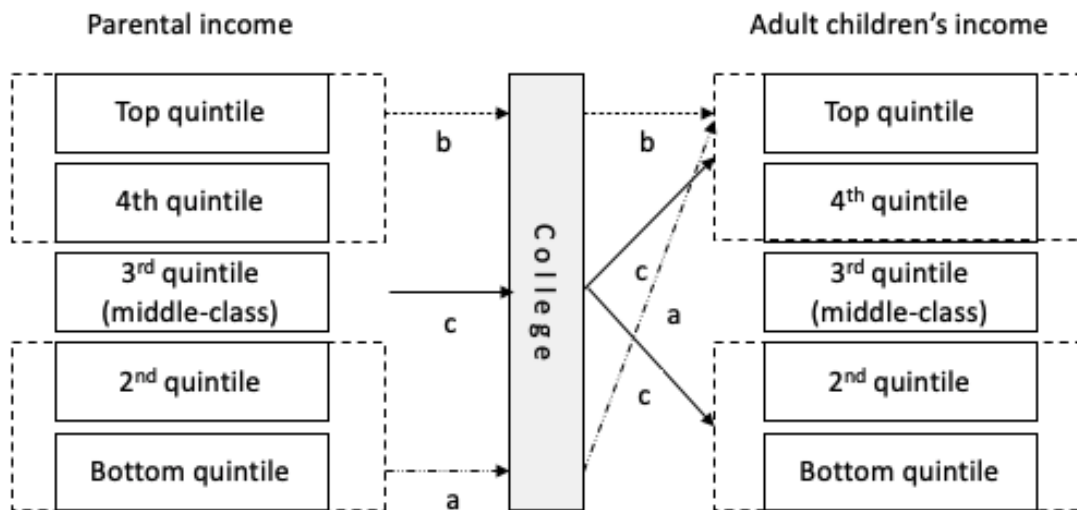
Note: (a) represents the concept of bottom-to-top mobility rate, (b) indicates the concept of status maintenance rate, and (c) shows the concept of middle-class mobility rate used in the analysis.

In Stage 1, I estimated three different mobility rates for colleges as suggested by the limited range of literature in the field—i.e., bottom-to-top mobility, status maintenance, and middle-class mobility rates (see Figure 1). Since the GOMS does not provide data from birth but provides rich information on college graduates across different cohorts, I estimated all mobility measures using a linear probability model and conditioned on birth year, age at graduation and gender as previous

studies suggested (e.g., Lee & Choi, 2020).

$$y_i = \beta_0 + \sum_{k=1}^{17} \beta_k (College\ group_k)_i + f(Age_i, Female_i) + g(Birth\ Year_i) + \varepsilon_i \quad (1)$$

From the equation above, $College\ group_k$ represents 17 college group categories in which an individual attended and β_k indicates a vector of regression coefficients for each college group. $f(Age_i, Female_i)$ is a function of age and gender including the interaction effect, and $g(Birth\ Year_i)$ is a birth year used as a categorical variable. The outcome variable y_i represents whether or not the individual is in the top quintile of the earnings distribution (or the top 40 per cent), or the bottom quintile (or the bottom 40 per cent). All three mobility rates are estimated based on this model, and the movements of those from the bottom and top 40 per cent is also examined to capture the whole picture of intergenerational social mobility.

Bottom-to-Top mobility rate

A college's bottom-to-top mobility rate is the product of its low-income access—the fraction of students coming from a household at the bottom quintile—and its success rate—the fraction of such students who reach the top quintile of the income distribution (Chetty et al., 2017). For this analysis, I calculated the average mobility rates for 17 different college groups.

$$P(Child\ in\ Q5\ and\ Parent\ in\ Q1) = P(Parent\ in\ Q1) \times P(Child\ in\ Q5 \mid Parent\ in\ Q1) \quad (2)$$

Much literature estimating mobility rates uses an adjusted mobility rate, taking into account the share of non-graduates in the analysis. However, given that the GOMS does not provide any information on non-graduates, it is impossible to provide adjusted mobility rates. Nonetheless, this is not a major issue because adjusted and unadjusted mobility rates appeared to be highly correlated in previous studies (e.g., Chetty et al., 2017; Reber & Sinclair, 2020).

Status maintenance rate

Taking the same approach as for the bottom-to-top mobility rate, the status maintenance rate is a product of access and success rates. Unlike the bottom-to-top mobility rate, the access rate for the status maintenance rate is defined as the fraction of students who come from the top quintile families. The success rate is the share of students from the top quintile of each college group who stay in the top quintile of the earnings distribution when they grow up.

$$P(Child\ in\ Q5\ and\ Parent\ in\ Q5) = P(Parent\ in\ Q5)\ \times\ P(Child\ in\ Q5\ |\ Parent\ in\ Q5) \qquad (3)$$

Middle-class mobility rate

The movements up or down the social hierarchy of the poorest and richest students are not the whole story. Although scholars define the 'middle-class' in various ways, I have defined 'middle-class' as those exclusively in the third quintile of the income distribution as many economists have suggested (e.g., Reber & Sinclair, 2020). For the middle-class mobility rate therefore, the access rate is the share of a college's enrolment coming from the third quintile of the parental income distribution. The success rate is the share of the third quintile students at a college who move up at least one quintile net the share of students who fall at least one earnings quintile (Reber & Sinclair, 2020).

$$Middle\ class\ mobility\ rate\ = P(Parent\ in\ Q3)\ \times\ \{P(Child\ in\ Q4\ or\ Q5\ |\ Parent\ in\ Q3) - P(Child\ in\ Q1\ or\ Q2\ |\ Parent\ in\ Q3)\} \qquad (4)$$

Statistical Significance

Stage 2 includes a logistic regression model estimating the success rates for the bottom-to-top mobility rates, taking into account various control factors, namely age (to control for work experiences), father's education level, college groups, college Grade Point Average (GPA), and

discipline subjects. Within this stage, separate models for male and female graduates are established. This is undertaken to check whether the estimated models, conditioning on various control variables, show the same trend of success rates with the one found from the descriptively examined mobility rates. The logistic regression model used in this stage is represented as follows:

$$logit(P_{it}) = \log\left(\frac{P_{it}}{1-P_{it}}\right) = \beta_0 + \beta_1 x_1 + \gamma X_{it} + e_{it} \qquad (5)$$

where the binary outcome variable Y indicates 1 for the top quintile income earners, or the probability of becoming the top quintile income earners for graduates i in time t is $P_{it} = P(Y = 1)$; x_1 is a categorical variable for the family income quintiles with 1 indicating the bottom quintile and 5 representing the top quintile; and the matrix X_{it} contains graduates' age, father's education level, college groups, college GPA, and discipline subjects.

Estimation and Results

Bottom-to-Top Mobility Rate

Table 1 represents the bottom-to-top mobility rates three years after graduation. Colleges with greater low-income access tend to have lower success rates on average as have been found in various contexts, namely the United Kingdom and the United States (e.g., Chetty et al., 2017; Britton et al., 2019). This is because less selective colleges not only admit a larger number of low-income students but also lead to jobs with the lowest earnings. For instance, the most selective group, which has a lower low-income access rate than private two-year colleges, has B20/T20 (bottom 20 to top 20) success rates of 52.23 per cent, while private two-year colleges, on average, have B20/T20 success rates of 13.17 per cent. Despite this trend, there is still variation in mobility rates across colleges because the correlation between access and success rates is -0.63(and not -1).

Table 1. Bottom-to-top mobility rates

Tier	Access (%)		Success Rate (%)		Mobility Rate (%)	
	B20	B40	T20 from B20	T40 from B40	B20/T20	B40/T40
1. Most selective	9.37	20.95	52.23	73.64	4.89	15.43
2. Highly selective, private	9.95	22.86	33.52	58.02	3.34	13.26
3. Selective, private (Seoul)	10.80	25.75	31.88	54.83	3.44	14.12
4. Selective, private (Outside of Seoul)	12.25	30.18	23.57	42.54	2.89	12.84
5. Selective, public	20.16	41.38	23.63	43.93	4.76	18.18
6. Non-selective, public	24.80	49.32	17.54	34.98	4.35	17.25
7. Non-selective, private (Seoul)	12.56	29.77	20.41	39.3	2.56	11.70
8. Non-selective, private (Gyeonggi, Incheon, Gangwon)	14.92	32.32	27.43	43.00	4.09	13.90
9. Non-selective, private (Chungcheong)	15.47	35.10	17.11	33.41	2.65	11.73
10. Non-selective, private (Gyeongsang)	15.66	36.10	17.25	31.97	2.70	11.54
11. Non-selective, private (Jeolla)	21.70	43.40	18.12	29.85	3.93	12.95
12. Private, two-year (Seoul)	26.96	48.10	8.94	25.07	2.41	12.06
13. Private, two-year (Gyeonggi, Incheon, Gangwon)	30.05	51.88	12.06	26.62	3.62	13.81
14. Private, two-year (Chungcheong)	38.97	60.33	14.27	28.15	5.56	16.98
15.Private, two-year (Gyeongsang)	35.50	59.17	14.26	29.51	5.06	17.46
16.Private, two-year (Jeolla)	47.67	68.21	16.33	28.91	7.78	19.72
17. Public, two-year	28.93	61.91	20.31	39.17	5.88	24.25

Note: Table 1 indicates the bottom-to-top mobility rates three years after college graduation without a gender split.

Table 2. Bottom-to-top mobility rates by gender

Tier	Males						Females					
	Access (%)		Success Rate (%)		Mobility Rate (%)		Access (%)		Success Rate (%)		Mobility Rate (%)	
	B20	B40	T20 from B20	T40 from B40	B20/T20	B40/T40	B20	B40	T20 from B20	T40 from B40	B20/T20	B40/T40
1. Most selective	10.19	19.92	54.99	79.42	5.60	15.82	7.33	23.54	40.45	56.79	2.96	13.37
2. Highly selective, private	11.34	21.47	38.35	66.68	4.35	14.32	7.78	25.30	22.79	44.13	1.77	11.16
3. Selective, private (Seoul)	12.29	23.78	36.78	63.73	4.52	15.15	8.97	28.16	20.64	43.81	1.85	12.34
4. Selective, private (Outside of Seoul)	13.73	28.79	28.91	51.96	3.97	14.96	10.00	32.29	11.95	29.56	1.20	9.54
5. Selective, public	21.21	40.50	28.13	52.13	5.97	21.11	18.01	43.19	11.07	27.99	1.99	12.09
6. Non-selective, public	25.90	48.58	23.71	44.93	6.14	21.83	22.92	50.58	5.95	19.75	1.36	9.99
7. Non-selective, private (Seoul)	14.52	27.31	28.20	53.71	4.09	14.67	11.16	31.54	11.05	28.72	1.23	9.06
8. Non-selective, private (Gyeonggi, Incheon)	16.13	31.21	32.40	51.72	5.23	16.14	12.57	34.47	15.33	27.72	1.93	9.56
9. Non-selective, private (Chungcheong)	16.66	34.20	22.42	43.42	3.74	14.85	13.41	36.66	6.39	19.25	0.86	7.06
10. Non-selective, private (Gyeongsang)	16.98	34.86	23.26	43.60	3.95	15.20	13.64	38.00	5.98	18.60	0.82	7.07
11. Non-selective, private (Jeolla)	22.21	42.39	23.18	40.41	5.15	17.13	20.92	44.96	9.50	15.76	1.99	7.09
12. Private, two-year (Seoul)	25.95	49.30	17.51	36.29	4.54	17.89	27.83	47.07	1.16	13.94	0.32	6.56
13. Private, two-year (Gyeonggi, Incheon)	28.42	52.79	18.59	35.57	5.28	18.78	32.54	50.48	4.18	13.24	1.36	6.68
14. Private, two-year (Chungcheong)	36.73	61.28	20.90	37.16	7.68	22.77	42.32	58.91	7.04	14.81	2.98	8.72
15. Private, two-year (Gyeongsang)	33.02	59.38	21.04	39.09	6.95	23.21	39.03	58.87	6.55	16.24	2.56	9.56
16. Private, two-year (Jeolla)	45.01	68.03	25.06	40.13	11.28	27.30	50.8	68.42	7.47	15.57	3.79	10.65
17. Public, two-year	29.27	62.62	22.61	43.35	6.62	27.15	28.17	60.27	12.55	25.81	3.54	15.56

Note: Table 2 indicates the bottom-to-top mobility rates by gender three years after college graduation. Access represents the fraction of students who come from the bottom quintile (Q1) (or the bottom 40 per cent: Q1 or Q2) of the family income distribution for each college group, and the success rate indicates the fraction of such students who end up in the top quintile (Q5) (or the top 40 per cent: Q4 or Q5) of the earnings distribution. The bottom-to-top mobility rates are defined as a product of the access and success rates, indicating the fraction of student coming from Q1 of the distribution (or the bottom 40 per cent) and ending up in Q5 (or the top 40 per cent). Both access and success rates were estimated using the linear probability model and conditioned on age, birth year, and gender.

In a perfectly mobile society, the level of bottom-to-top mobility (B20/T20) would be four per cent, meaning 20 out of 100 students attending a certain university come from the bottom quintile, and four out of the 20 students end up becoming the top quintile earners. Among 17 different college groups, 'most selective', 'selective/non-selective, public', 'non-selective, private—*Gyeonggi*', 'private, two-year—*Chungcheong, Gyeongsang, Jeolla'* and 'public, two-year' colleges have bottom-to-top mobility rates greater than four per cent, indicating colleges in those groups contribute substantially to promoting upward mobility.

The bottom-to-top mobility rate for the most selective group is higher than for many other four-year universities mainly due to its relatively higher success rate—e.g., the mean success rate for the most selective university group is 52.23 per cent, nearly three times higher than that for non-selective private four-year colleges in *Chungcheong* province. The mobility rate for the most selective universities is 9.37% × 52.23% = 4.89%. That is, 4.89 out of 100 students at the most selective universities came from a family in the bottom quintile and reached the top quintile. For the bottom-to-top mobility rate (B40/T40), with the same logic, the expected rate of mobility is 16 per cent. The most selective universities show a very slightly lower-than-expected level of bottom-to-top mobility rates—15.43 per cent, indicating 15.43 out of 100 students at the most selective college group came from the first (bottom) or second quintile and reached the fourth or fifth (top) quintile. The trends of both bottom-to-top mobility rates—i.e., B20/T20 and B40/T40—are similar (r=0.848), indicating a college group with a higher B20/T20 mobility rate is likely to have a higher B40/T40 mobility rate.

It should be noted that private two-year colleges outside of *Seoul* have relatively higher bottom-to-top mobility rates, higher than the expected levels. Though much policy attention has been paid to four-year colleges, these two-year colleges indeed appear to be an engine for upward mobility. Because private two-year colleges in *Jeolla* province offer much greater low-income access than any other four-year institutions, they have a bottom-to-top (B20/T20) mobility rate of 7.78%, channelling nearly two times as many students from the bottom to the top of the income distribution as the most selective universities.

It is also worth noting that males have shown higher bottom-to-top mobility rates than females in all 17 college groups (see Table 2). For instance, 5.6 out of 100 male students at the most selective universities came from the bottom quintile and reached the top quintile of the earnings distribution.

By contrast, only 2.96 female students with the same demographic characteristics reached the top quintile. This is partly because male graduates are more likely to reach the top quintile in the earnings distribution, and several factors could explain this. First, occupational opportunities and preferences are different between males and females. More male college students prefer jobs in the field of finance, management, engineering, and information technology, which yield higher earnings (KEIS, 2008). Second, many employers, particularly larger firms, still favour males over females due to female career interruptions resulting from marriage and childbirth (Kwon, 2018). Lastly, many firms take into account males' mandatory military experiences as a career based on the *Support for Discharged Soldier Act*. Given that most firms take into account individuals' work experience or previous careers when determining wages (Kim, 2007), male graduates' military experiences, on average, allow them to start with higher earnings than females even right after college. For these reasons, more males reached the top income quintile than females—e.g., 28.33 and 11.33 per cent, respectively, three years after graduation (see Appendix A). Due to this trend, males have shown higher mobility rates than females in all three different mobility rates estimated in this analysis.

Status Maintenance Rate

The status maintenance rate represents the share of students in a college group coming from the top quintile of the income distribution and who stay in the top quintile after graduation. With the status maintenance rate, the mobility of students from the top quintile (or the top 40 per cent) can be also observed, and more detailed information on the role of higher education in intergenerational social mobility can be obtained.

Many more students from the richest families—36.11 per cent (see Table 3)—attended the most selective universities than did students from the poorest families—9.37 per cent (see Table 1). Here, again, the expected level of status maintenance rate (T20/T20) is four per cent. Among 17 different college groups, 'most selective', 'highly selective, private', 'selective, private— *Seoul/non-Seoul*', and 'non-selective, private—*Seoul*/*Gyeonggi*' colleges show a status maintenance rate greater than the expected level of four per cent. Given that the majority of college groups with higher status maintenance rates are selective private colleges located near the capital city—e.g., *Seoul*, *Gyeonggi*, and *Incheon*, college prestige and whether or not college is located near *Seoul* seem to be significant factors.

Table 3. Status maintenance rates

Tier	Access (%)		Success Rate (%)		Status Maintenance Rate (%)	
	T20	T40	T20 from T20	T40 from T40	T20/T20	T40/T40
1. Most selective	36.11	61.60	49.56	75.89	17.90	46.75
2. Highly selective, private	31.97	56.70	30.68	59.74	9.81	33.87
3. Selective, private (Seoul)	30.31	54.14	28.00	57.63	8.49	31.20
4. Selective, private (Outside of Seoul)	21.87	46.30	20.55	45.60	4.49	21.11
5. Selective, public	14.80	35.18	23.12	49.25	3.42	17.33
6. Non-selective, public	11.33	28.40	17.25	38.72	1.95	11.00
7. Non-selective, private (Seoul)	27.15	49.52	15.92	40.41	4.32	20.01
8. Non-selective, private (Gyeonggi, Incheon)	24.16	46.70	26.15	47.29	6.32	22.08
9. Non-selective, private (Chungcheong)	21.14	42.79	17.40	39.91	3.68	17.08
10. Non-selective, private (Gyeongsang)	16.95	38.88	16.31	37.59	2.76	14.61
11. Non-selective, private (Jeolla)	16.92	34.57	15.37	33.50	2.60	11.58
12. Private, two-year (Seoul)	12.93	28.32	7.12	22.66	0.92	6.42
13. Private, two-year (Gyeonggi, Incheon)	12.51	26.36	10.76	26.44	1.35	6.97
14. Private, two-year (Chungcheong)	8.30	19.45	14.94	28.66	1.24	5.57
15. Private, two-year (Gyeongsang)	7.05	19.34	15.57	30.91	1.10	5.98
16. Private, two-year (Jeolla)	6.55	15.80	18.71	31.51	1.23	4.98
17. Public, two-year	9.68	18.13	17.28	39.03	1.67	7.08

Note: Table 3 indicates the status maintenance rates three years after college graduation. Access represents the fraction of students who come from the top quintile (Q5) (or the top 40 per cent: Q4 or Q5) of the family income distribution for each college group, and the success rate indicates the fraction of such students who end up in the top quintile (Q5) (or the top 40 per cent: Q4 or Q5) of the earnings distribution. Status maintenance rates are defined as a product of access and success rates, indicating the fraction of student coming from Q5 (or the top 40 per cent) of the family income distribution and ending up in Q5 (or the top 40 per cent) of the earnings distribution. Both access and success rates were estimated using the linear probability model and conditioned on age, birth year, and gender.

It is also important to note that the success rates for students from the bottom quintile (see Table 1) and the top quintile income families (see Table 3) do not significantly vary within the college group, indicating students who graduated from the same college group, on average, have similar success rates, regardless of their socioeconomic backgrounds.

Middle-Class Mobility Rate

Table 4. Middle class mobility rates

Tier	3 year after graduation				
	(A)	(B)	(C)	(D)	Middle class mobility rate (%)
	Q3 Access (%)	T40 from Q3 (%)	B40 from Q3 (%)	(B) – (C)	(A) * (D)
1. Most selective	17.45	74.70	14.97	59.73	10.42
2. Highly selective, private	20.44	59.94	22.90	37.04	7.57
3. Selective, private (Seoul)	20.11	55.44	25.96	29.48	5.93
4. Selective, private (Outside of Seoul)	23.52	43.20	35.31	7.89	1.86
5. Selective, public	23.44	45.15	35.73	9.42	2.21
6. Non-selective, public	22.28	36.65	38.93	-2.28	-0.51
7. Non-selective, private (Seoul)	20.71	37.87	42.03	-4.16	-0.86
8. Non-selective, private (Gyeonggi, Incheon)	20.98	42.35	37.89	4.46	0.94
9. Non-selective, private (Chungcheong)	22.10	33.64	44.62	-10.98	-2.43
10. Non-selective, private (Gyeongsang)	25.02	33.01	46.39	-13.38	-3.35
11. Non-selective, private (Jeolla)	22.03	28.00	51.12	-23.12	-5.09
12. Private, two-year (Seoul)	23.57	20.80	57.70	-36.90	-8.70
13. Private, two-year (Gyeonggi, Incheon)	21.76	22.35	58.36	-36.01	-7.84
14. Private, two-year (Chungcheong)	20.23	25.52	58.16	-32.64	-6.60
15.Private, two-year (Gyeongsang)	21.49	25.26	57.02	-31.76	-6.83
16.Private, two-year (Jeolla)	15.99	26.25	57.68	-31.43	-5.03
17. Public, two-year	19.97	35.55	39.36	-3.81	-0.76

Notes: Table 4 shows the middle-class mobility rates three years after college graduation. Column A represents the fraction of students who come from the third quintile (Q3) of the family income distribution for each college group, and column B indicates the share of such students who move up at least one quintile (either Q4 or Q5) in the earnings distribution. Column C represents the share of Q3 students who fall at least one quintile (either Q1 or Q2) in the earnings distribution. The success rate (column D) for the middle-class mobility is therefore the share of Q3 students who move up at least one quintile net the share of Q3 students who fall at least one quintile in the earnings distribution. Both access and success rates were estimated using the linear probability model and conditioned on age, birth year, and gender.

The middle-class mobility rate indicates the share of students at a college who come from the middle quintile of the parental income distribution and move up at least one quintile in adulthood. Unlike the bottom-to-top mobility and status maintenance rates, the share of students who fall at least one earnings quintile is also taken into account for the middle-class mobility. The middle-class mobility rates vary substantially across college types (see Table 4). Colleges with a higher

bottom-to-top mobility rate do not necessarily have a higher middle-class mobility rate. These inconsistent trends partly come from the differences in access rates, which may be related to policies for the national scholarships scheme implemented until 2018. This scheme was not open to students from the middle-class and focused solely on low-income students, usually defined as those from the bottom 30 per cent of the income distribution (Ministry of Education, 2018). Hence, access may well have been boosted for those from the bottom 30 per cent of the income distribution relative to those from the middle of the income distribution.

It is also notable that the access rate for students from the middle quintile does not significantly vary across the college groups and is approximately 20 per cent for each group. For instance, 17.45 out of 100 students at the most selective universities came from the middle quintile income families, and 23.57 per cent of students at private two-year colleges in *Seoul* came from the middle quintile. By contrast, the success rate, the share of students moving up at least one quintile of the income distribution net the share of students falling down at least one quintile of the income distribution, varies substantially across college groups. For instance, 74.70 per cent of those at the most selective universities who came from the middle quintile moved up at least one income quintile (with a success rate of 59.73). For those at private two-year colleges in *Seoul*, only 20.80 per cent of students who came from the middle quintile reached the fourth or fifth (top) quintile (with a success rate of -36.90). That is, the gaps in the middle-class mobility rate across college groups mainly stem from the differences in success rates, which are often associated with academic preparation and college prestige.

Among 17 college groups, 'most selective', 'highly selective', 'selective private—*Seoul/non-Seoul*', 'selective public', and 'non-selective private—*Gyeonggi*' universities show positive middle-class mobility rates, indicating students who graduated from colleges in those groups are more likely to upwardly mobile than downwardly mobile. The most selective four-year colleges, on average, have the highest rates of middle-class mobility, followed by 'highly selective, private', 'selective, private' and 'selective public' colleges, indicating colleges with more prestige are more likely to promote upward mobility for students from the middle-class.

Table 5. Middle class mobility rates by gender

Tier	Males					Females				
	(A)	(B)	(C)	(D)	Middle class mobility	(A)'	(B)'	(C)'	(D)'	Middle class mobility
	Q3 Access (%)	T40 from Q3 (%)	B40 from Q3 (%)	(B) – (C)	(A) * (D)	Q3 Access (%)	T40 from Q3 (%)	B40 from Q3 (%)	(B)' – (C)'	(A)' * (D)'
1. Most selective	16.74	83.43	6.46	76.97	12.88	19.23	54.80	34.39	20.41	3.92
2. Highly selective, private	19.36	71.71	11.49	60.22	11.66	22.11	42.21	40.09	2.12	0.47
3. Selective, private (Seoul)	19.37	69.30	12.72	56.58	10.96	21.02	38.81	41.86	-3.05	-0.64
4. Selective, private (Outside of Seoul)	22.14	56.39	22.15	34.24	7.58	25.62	25.72	52.74	-27.02	-6.92
5. Selective, public	22.19	56.85	23.73	33.12	7.35	26.04	25.89	55.49	-29.60	-7.71
6. Non-selective, public	20.64	46.29	28.14	18.15	3.75	25.07	19.05	58.67	-39.62	-9.93
7. Non-selective, private (Seoul)	19.11	56.48	24.06	32.42	6.20	21.86	25.75	53.73	-27.98	-6.12
8. Non-selective, private (Gyeonggi, Incheon)	19.89	54.54	25.72	28.82	5.73	23.09	24.15	26.07	-1.92	-0.44
9. Non-selective, private (Chungcheong)	20.51	45.66	31.43	14.23	2.92	24.88	16.80	63.11	-46.31	-11.52
10. Non-selective, private (Gyeongsang)	23.53	46.31	32.48	13.83	3.25	27.29	15.91	64.27	-48.36	-13.20
11. Non-selective, private (Jeolla)	20.45	41.74	36.18	5.56	1.14	24.48	10.91	69.68	-58.77	-14.39
12. Private, two-year (Seoul)	21.08	13.92	41.80	-27.88	-5.88	25.73	12.91	68.99	-56.08	-14.43
13. Private, two-year (Gyeonggi, Incheon)	20.19	31.36	44.88	-13.52	-2.73	24.17	10.34	76.32	-65.98	-15.95
14. Private, two-year (Chungcheong)	18.73	35.91	43.32	-7.41	-1.39	22.46	12.04	77.41	-65.37	-14.68
15. Private, two-year (Gyeongsang)	20.10	34.99	42.85	-7.86	-1.58	23.48	13.46	74.21	-60.75	-14.26
16. Private, two-year (Jeolla)	15.14	36.07	44.83	-8.76	-1.33	17.00	15.28	72.02	-56.74	-9.65
17. Public, two-year	18.53	42.98	29.93	13.05	2.42	23.25	26.14	51.31	-25.17	-5.85

Notes: Table 5 shows the middle-class mobility rates three years after college graduation by gender. Column A represents the fraction of students who come from the third-quintile (Q3) of the family income distribution for each college group, and column B and B' indicate the share of Q3 students who move up at least one quintile (either Q4 or Q5). Column C and C' represent the share of Q3 students who fall at least one earnings quintile (either Q2 or Q1). Success rates (column D and D') for the middle-class mobility is therefore the share of Q3 students who move up at least one quintile net the share of Q3 students who fall at least one earnings quintile. Both access and success rates were estimated using the linear probability model and conditioned on age, birth year, and gender.

Males have shown higher middle-class mobility rates than females in all college groups as was the case for bottom-to-top mobility (see Table 5). Males who went to four-year colleges, regardless of prestige and location, have shown positive middle-class mobility rates, indicating more students from the middle quintile attending four-year colleges moved up the socioeconomic ladder than moved down. By contrast, for females, all college groups, bar the 'most selective' and 'highly selective, private' colleges, have shown negative middle-class mobility rates. Given that fewer females than males reached the top quintile earnings distribution three years after graduation, the trend of negative middle-class mobility rates for females in many college groups seems inevitable. That is, it is more likely for females from the middle quintile to slip down from the social ladder when attending those less selective colleges.

Statistical Significance

The next step is to determine the statistical significance of these observed patterns to check whether the given patterns still hold after allowing for various control factors, namely college-related features, age (to control for work experiences), and father's education level. Table 6 presents results from three binary logistic models that specify the probability of those from the lowest quintile reaching the top quintile in the earnings distribution. These models are applied to the full sample as well as male and female sub-samples. The coefficients in this model are displayed as odd ratios. These represent the odds (or likelihood) of being the top quintile income earners given a one-unit increase in the explanatory variables. The odd ratio of 1 indicates no effect, and numbers greater than 1 demonstrate increased odds, whereas numbers less than 1 show decreased odds (Hosmer et al., 2013; Carter et al., 2020).

In further investigating gender differences in the likelihood to reach the top quintile income, family income was found to significantly predict the labour market outcome, or wages, for both males and females (see Table 6). Model 2 reveals that males from a household at the top quintile, for instance, are 2.1 times more likely to become the top quintile income earners than those from a household at the bottom quintile, after controlling for additional explanatory factors. Females from the top quintile show higher odds—e.g., 2.4 times more likely to reach the top quintile than those from the bottom quintile—compared with males from the same quintile. It implies that the impact of higher education on levelling the socioeconomic gaps is smaller for females than males, strengthening the findings from the descriptively examined mobility rates in Stage 1 that females,

on average, benefit less from higher education institutions than males.

Table 6. Logistic regression model estimates of the top quintile income earners

	(1)	(2)	(3)
	Full Model	Male	Female
Monthly family income quintile			
The bottom quintile (Q1)	1	1	1
	(.)	(.)	(.)
2nd quintile (Q2)	0.924*	0.804***	1.405***
	(-1.70)	(-4.13)	(3.36)
3rd quintile (Q3)	1.372***	1.326***	1.571***
	(7.39)	(5.83)	(4.62)
4th quintile (Q4)	1.594***	1.347***	2.244***
	(10.75)	(6.12)	(8.08)
The top quintile (Q5)	2.203***	2.074***	2.432***
	(18.12)	(14.72)	(9.03)
Age	1.114***	1.113***	1.107***
	(36.12)	(25.35)	(19.01)
College groups			
Most selective	1	1	1
	(.)	(.)	(.)
Highly Selective Private	0.478***	0.485***	0.509***
	(-14.27)	(-11.55)	(-7.11)
Selective Private (Seoul)	0.423***	0.437***	0.497***
	(-11.85)	(-9.09)	(-5.59)
Selective Private (non-Seoul)	0.268***	0.299***	0.212***
	(-20.75)	(-16.26)	(-11.76)
Selective Public	0.295***	0.314***	0.235***
	(-22.92)	(-18.75)	(-12.86)
Non-selective Public	0.231***	0.249***	0.179***
	(-19.24)	(-16.07)	(-9.83)
Non-selective Private (Seoul)	0.224***	0.256***	0.242***
	(-19.74)	(-13.80)	(-11.35)
Non-selective Private (Gyeonggi, Incheon)	0.332***	0.354***	0.266***
	(-19.26)	(-15.60)	(-11.09)
Non-selective Private (Chungcheong)	0.211***	0.225***	0.149***
	(-25.44)	(-21.32)	(-13.83)
Non-selective Private (Gyeongsang)	0.194***	0.203***	0.154***
	(-26.83)	(-22.48)	(-14.50)
Non-selective Private (Jeolla)	0.150***	0.150***	0.142***
	(-23.41)	(-20.18)	(-11.82)
Private Junior (Seoul)	0.114***	0.124***	0.126***
	(-20.07)	(-15.56)	(-11.02)
Private Junior (Gyeonggi, Incheon)	0.129***	0.149***	0.0851***
	(-32.20)	(-26.16)	(-17.24)
Private Junior (Chungcheong)	0.147***	0.164***	0.112***
	(-20.34)	(-16.55)	(-11.26)
Private Junior (Gyeongsang)	0.133***	0.180***	0.0621***
	(-28.33)	(-21.45)	(-16.71)
Private Junior (Jeolla)	0.107***	0.163***	0.0641***
	(-27.27)	(-19.07)	(-16.40)
Public Junior	0.218***	0.198***	0.321***
	(-7.13)	(-6.42)	(-2.79)
College GPA	1.023***	1.041***	1.035***
	(6.88)	(10.59)	(4.64)
Father's education level	Yes	Yes	Yes
Discipline subjects	Yes	Yes	Yes
Observations	45,119	26,778	18,341

Note: Robust standard errors in parenthesis. Exponential coefficients for age, college GPA, father's education level, and discipline subjects are included as controls. Asterisks *, **, *** indicate statistical significance at 10, 5, and 1%.

Based upon the logistic regression model established, the average predicted probabilities of each college group to reach the top income quintile three years after graduation were examined for the graduates who come from a household at the bottom income quintile.

Table 7. Average predicted probabilities of each college group to reach the top quintile of the earnings distribution

College group	Males (n=26,778)			Females (n=18,431)		
	Margin	z	P>|z|	Margin	z	P>|z|
1. Most Selective	.486	35.64	0.000	.225	13.30	0.000
2. High Selective Private	.323	27.52	0.000	.136	12.57	0.000
3. Selective Private (Seoul)	.302	17.47	0.000	.134	9.85	0.000
4. Selective Private (non-Seoul)	.232	20.20	0.000	.066	8.63	0.000
5. Selective Public	.240	26.72	0.000	.072	10.41	0.000
6. Non-Selective Public	.203	16.86	0.000	.057	6.63	0.000
7. Non-Selective Private (Seoul)	.207	14.17	0.000	.074	9.16	0.000
8. Non-Selective Private (Gyeonggi, Incheon)	.261	24.09	0.000	.080	9.85	0.000
9. Non-Selective Private (Chungcheong)	.188	20.67	0.000	.049	8.23	0.000
10. Non-Selective Private (Gyeongsang)	.173	20.17	0.000	.050	8.84	0.000
11. Non-Selective Private (Jeolla)	.136	14.03	0.000	.047	7.02	0.000
12. Private Junior (Seoul)	.117	9.34	0.000	.042	6.09	0.000
13. Private Junior (Gyeonggi)	.136	19.81	0.000	.029	8.22	0.000
14. Private Junior (Chungcheong)	.147	12.26	0.000	.038	6.10	0.000
15. Private Junior (Gyeongsang)	.157	18.22	0.000	.022	7.07	0.000
16. Private Junior (Jeolla)	.146	14.72	0.000	.023	7.31	0.000
17. Public Junior	.170	5.13	0.000	.094	2.97	0.003

Note: Table 7 shows the average predicted probabilities of each college group to reach the top income quintile in the labour market if graduates come from the most disadvantaged family background

The average predicted probability in Table 7 indicates that, for instance, if graduates in the sample from the bottom quintile families are treated as if they attend the most selective four-year college group, then the predicted probability for them to reach the top quintile income would be 0.486 and 0.225 for males and females, respectively. The trend of success rates measured for the bottom-to-top mobility rates (see Table 2) is similar to the trend of the average predicted probability of each college group (see Table 7), implying the descriptively examined mobility rates in Stage 1 have well captured the trend of success rates for each college group. Overall, this analysis reveals that the success rates and gender differences in the influences of family background on wages still hold even after allowing for a wide array of additional explanatory variables.

Implications from the Various Mobility Rates for Colleges

Figure 2. Bottom-to-top mobility rate (B20/T20) vs. Status maintenance rate (T20/T20).
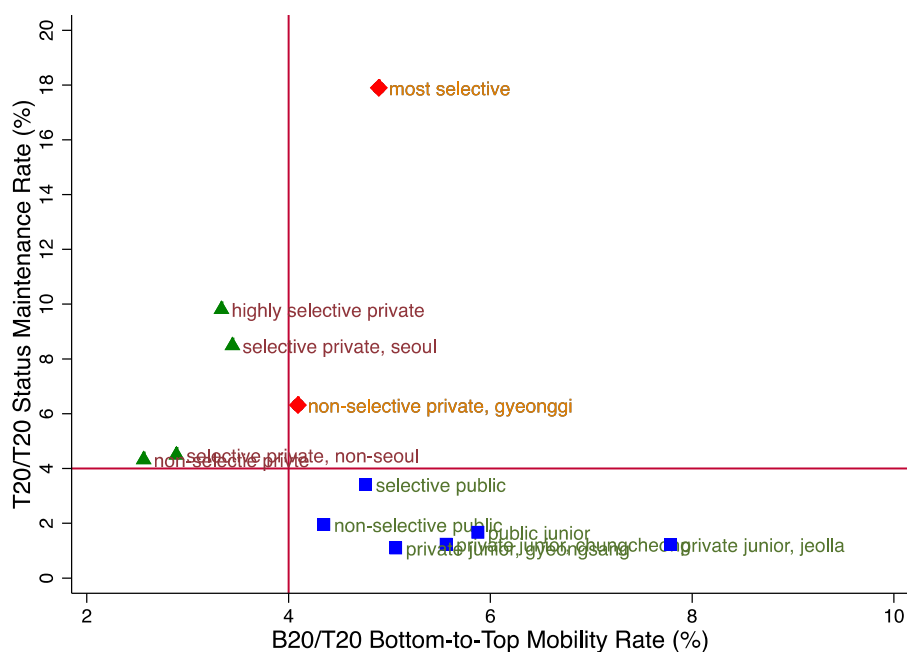
Note: The vertical and horizontal reference lines indicate the expected level of mobility rates in a perfectly mobile society, 4%.

Three different mobility rates for colleges have been examined, and it is important to review those measures together to understand better the whole picture of intergenerational social mobility. In Figure 2, the horizontal and vertical reference lines for the scatter plot between bottom-to-top mobility (B20/T20) and status maintenance rates (T20/T20) indicate the expected level of bottom-to-top mobility and status maintenance rates in a perfectly mobile country, four per cent. Colleges with bottom-to-top mobility rates higher than four per cent—i.e., on the right-hand side of the vertical reference line—contribute to promoting upward social mobility for students from the bottom quintile while those with status maintenance rates higher than four per cent—i.e., above the horizontal reference line—are more likely to provide a glass floor for the richest students.

One can intuitively see if colleges contribute more as a social ladder or a glass floor by comparing the distances from the given reference lines. The most selective group belongs in the upper right quadrant (see Figure 2), indicating institutions in the group serve as both a social ladder and a glass floor. However, the distance from the vertical reference line is much closer than that from the horizontal reference line, indicating the most selective universities play a role as a glass floor more strongly than as a social ladder. 'Highly selective, private', 'selective private—*Seoul/non-Seoul'*,

and 'non-selective, private—*Seoul*' colleges appear to have relatively higher status maintenance rates but have lower-than-expected bottom-to-top mobility rates, implying they play a role as a glass floor rather than a social ladder in society.

Figure 3. Bottom-to-top mobility rate (B40/T40) vs. Status maintenance rate (T40/T40). Reference lines = 16%
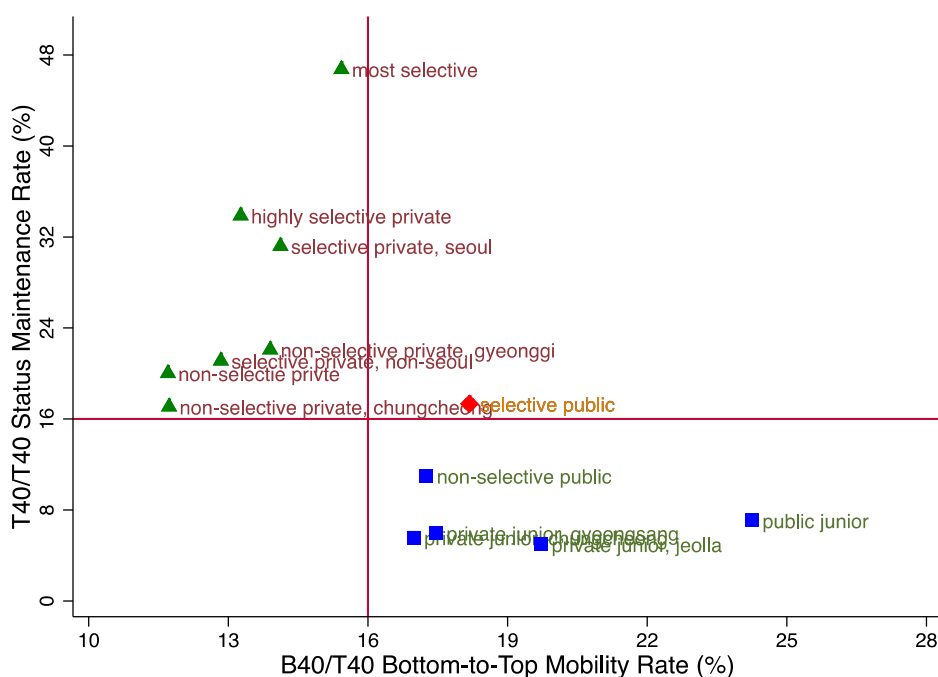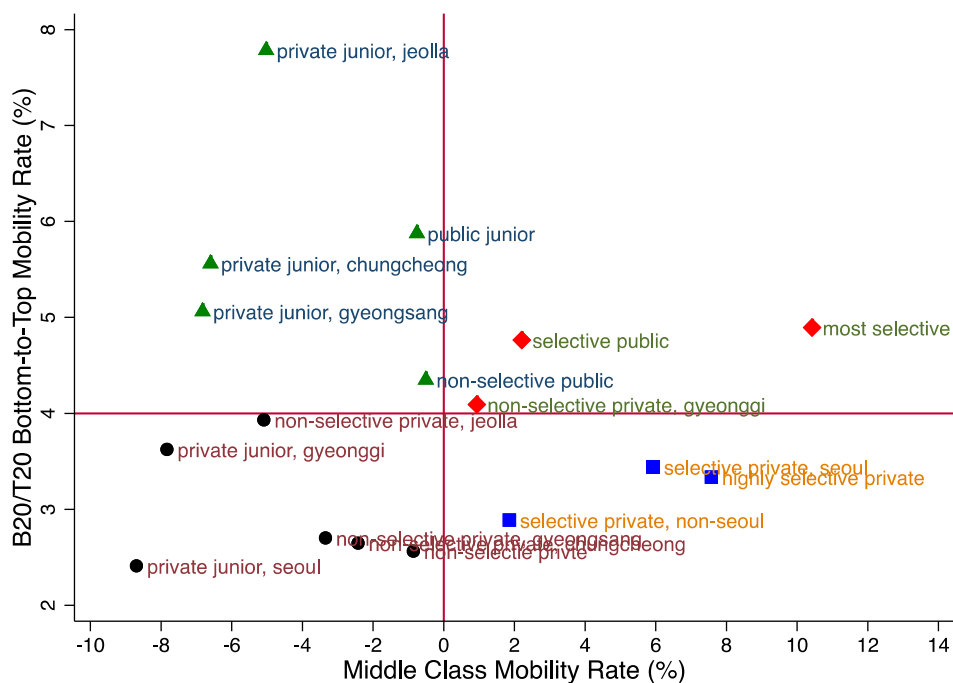

Note: The vertical and horizontal reference lines indicate the expected level of mobility rates in a perfectly mobile society, 16%.

Though B20/T20 and B40/T40 bottom-to-top mobility rates are highly correlated, colleges' position slightly differs when placed on the scatter plot. In Figure 3, the horizontal and vertical reference lines for the scatter plot between B40/T40 and T40/T40 indicate the expected level of mobility rates, 16 per cent. Only 'selective public' universities play a role as both a social ladder and a glass floor. They are slightly more likely to serve as a social ladder given the distances from the reference lines. This is important because other selective universities—e.g., 'most selective', 'highly selective private', and 'selective private four-year colleges in *Seoul*'—do not necessarily play a critical role in promoting upward mobility for students from the poorer backgrounds, i.e., those from the bottom 40 per cent, but provide a glass floor for students from the richer families. Although those attending these selective institutions are more likely to have higher earnings regardless of family background, these selective universities do not show a higher-than-expected level of bottom-to-top mobility rate mainly due to their lower low-income access rates. Only

'selective public' four-year colleges play a critical role simultaneously as a social ladder and a glass floor by guaranteeing a sufficient level of success for all students albeit with limited access for low-income students.
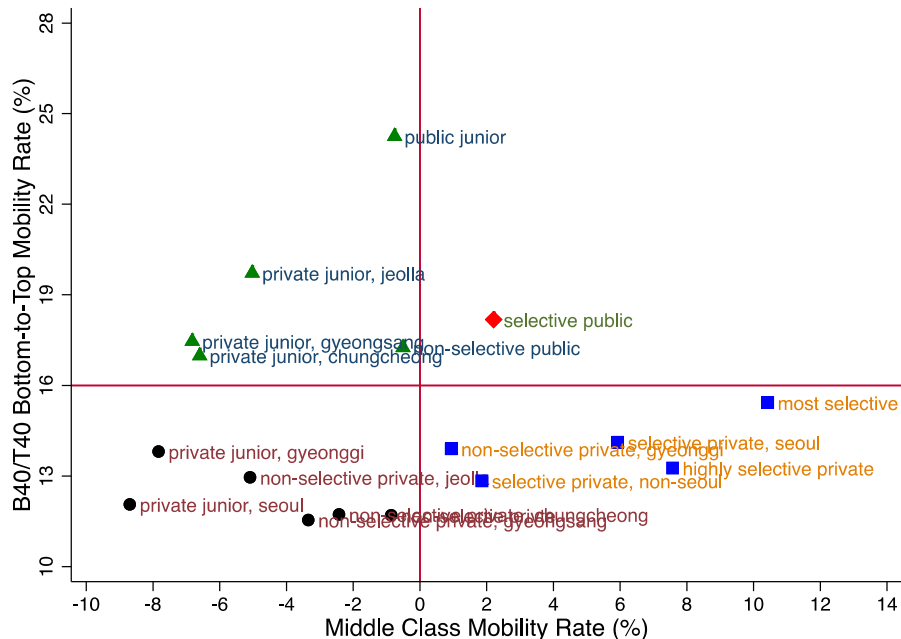
Figure 4. Bottom-to-top mobility rate (B20/T20) vs. Middle class mobility rate

Note: The horizontal line indicates the expected level of mobility rate in a perfectly mobile society, 4%, and the vertical reference line represents the middle-class mobility rate of zero.

Figure 4 (Figure 5) represents scatter plots between B20/T20 (B40/T40) mobility and middle-class mobility rates. The horizontal reference lines represent the expected level of bottom-to-top mobility rate as shown in Figures 2 and 3. The vertical reference lines indicate the middle-class mobility rate of zero, indicating the share of middle quintile students moving up at least one income quintile equals the share of those falling down at least one income quintile. In Figure 4, three college groups, i.e., 'selective public', 'most selective', and 'non-selective, private—*Gyeonggi*', have bottom-to-top mobility rates (B20/T20), higher than four per cent, and middle-class mobility rates, higher than zero, implying students from both the bottom and middle quintiles, on average, are more likely to move up the socioeconomic ladder when attending institutions in those groups. Again, only 'selective public' universities show higher-than-expected bottom-to-top (B40/T40) and positive middle-class mobility rates (see Figure 5).

Figure 5. Bottom-to-top mobility rate (B40/T40) vs. Middle class mobility rate

Note: The horizontal reference line indicates the expected level of mobility rate in a perfectly mobile society, 16%, and the vertical reference line represents the middle-class mobility rate of zero.

These findings imply that 'selective public' four-year colleges are the main engines of upward social mobility for students not only from the bottom 40 per cent but from the middle-quintile. Though some private two-year colleges outside of *Seoul* substantially contribute to promoting upward social mobility by accepting many low-income students, particularly those from the bottom quintile, they contributed less to promoting upward social mobility for those from the middle quintile. It implies that private two-year colleges particularly outside of *Seoul* have the potential to become the engine of upward social mobility due to their lower tuition fees and/or higher low-income access and therefore should arguably be the focus of more attention from policymakers and stakeholders.

Discussion and Conclusion

The aim of this paper is to assess the role of 17 college groups in intergenerational social mobility with three different mobility rates, and it documents two key results. First, mobility rates for colleges are higher for males than females in all three measures. This is partly because the share of male graduates reaching the top quintile appears to be much larger than that of female graduates.

Overall, colleges in South Korea seem to be less effective at helping female graduates from low-income backgrounds to become high earners. Second, many selective colleges are more likely to play a role as a glass floor than a social ladder mainly due to their lower low-income access, and only 'selective public' four-year universities turn out to be the engines of upward social mobility. These findings suggest that there is little evidence that all higher education institutions encourage social mobility and guarantee the equality of opportunity for all students to upwardly mobile. That is, attending college potentially promotes intergenerational social mobility for students who grew up in low- and middle-income families; however, unfortunately, not all colleges offer the same opportunities for upward mobility, and which college group young adults attend in turn depends heavily on their parental income (Reber & Sinclair, 2020). This has important implications. Though many people in South Korea believe that education is the single greatest hope to achieve upward social mobility and indeed invest heavily in children's education, these findings cast doubt on the idea that college attendance alone can promote social mobility.

Clearly, these findings should be considered in light of some data limitations I faced. First, the GOMS does not provide high-quality administrative data on individuals' family income. Respondents were asked to recall the information. This may result in measurement error that, if classical in nature, will tend to attenuate the coefficients on the family income quintiles in Stage 2. Second, I was only able to examine the mobility rates for 17 college groups due to data limitation and confidentiality issues. Hence, my 17 college tiers may include a heterogeneous range of institution qualities that may hide big differences in the mobility rates for individual institutions. Lastly, the GOMS does not provide information on non-graduates and, as a result, considering the share of non-graduates in the mobility rates was not possible. Future research could usefully take into account the share of non-graduates in various mobility rates based upon individual institutions in South Korea. This would require access to large-scale administrative data to generate sample sizes sufficient to compare graduates from individual institutions.

In conclusion, I showed the extent to which different college groups contribute to promoting bottom-to-top mobility, status maintenance, and middle-class mobility in South Korea. Though this analysis does not necessarily identify causal relationships that can be manipulated to improve social mobility outcomes for individual colleges, it does document patterns of social mobility that are likely to be of great interest to policymakers and highlights the need for further research into

the role that colleges play as potential engines of upward social mobility in South Korea.

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Appendix

Appendix A Wage quintiles by gender

Males			Females		
Wage quintile	Freq.	Percent	Wage quintile	Freq.	Percent
Q1 (Bottom)	2,205	10.00	Q1 (Bottom)	4,226	29.88
Q2	3,410	15.46	Q2	3,568	25.23
Q3	4,535	20.57	Q3	2,596	18.36
Q4	5,654	25.64	Q4	2,149	15.20
Q5 (Top)	6,247	28.33	Q5 (Top)	1,602	11.33
Total	22,051	100.00	Total	14,141	100.00

Note: The table presents that fewer females, 11.33%, than males, 28.33%, reached the top quintile earnings distribution three years after graduation.