The Analysis of 'Mun-Song' Phenomenon in Korea

- focusing on University Graduates' Employment Outcomes

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SKKU-Keio
Joint Undergraduate Economics Research Conference

December 21, 2019

Outline

Outline

Some backgrounds on Korean education

- Clear separation between
  - Humanities / Social Science (文科)
  - Natural Science / Engineering (理科)
- Most top universities in Korea are located in Seoul (except KAIST, POSTECH)
- Getting a permanent job in a big company is highly preferred by college students.
- Double major is more general than major-minor in Korea.
- The main criterion for double major is a high GPA

Motivation

- 문송합니다(Mun-song hamnida): I'm sorry I'm a liberal arts grad
  - People who major in Humanities have a trouble getting a job

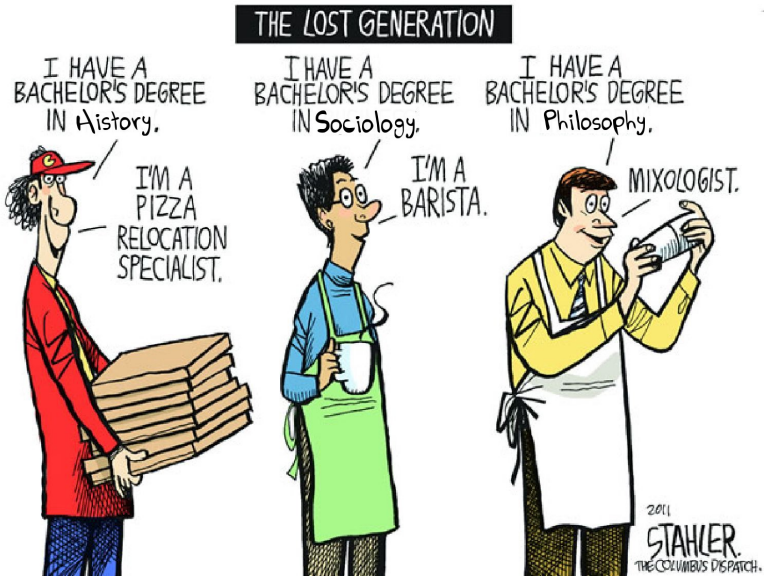


Figure: American cartoon

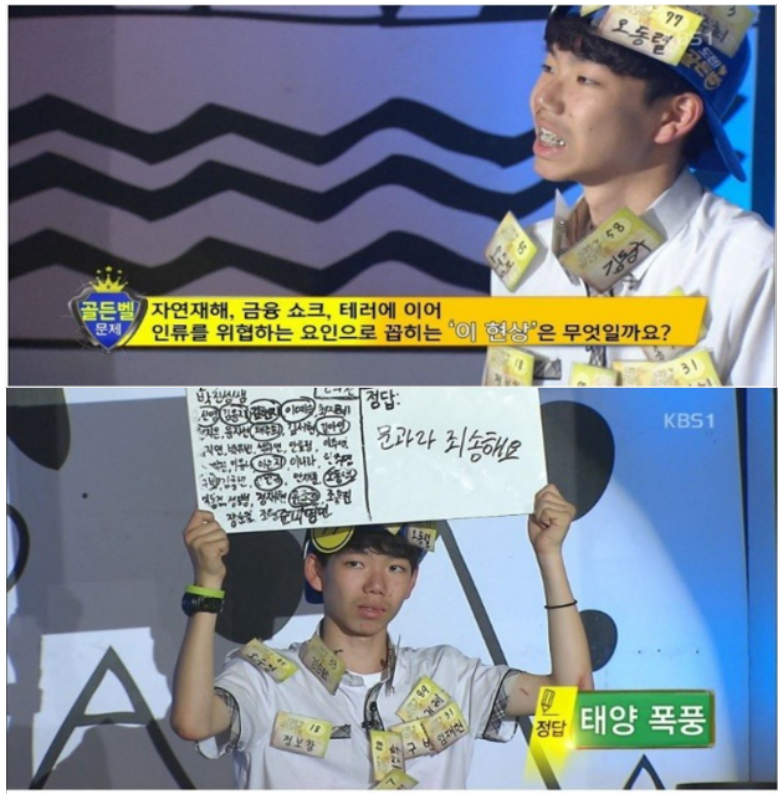
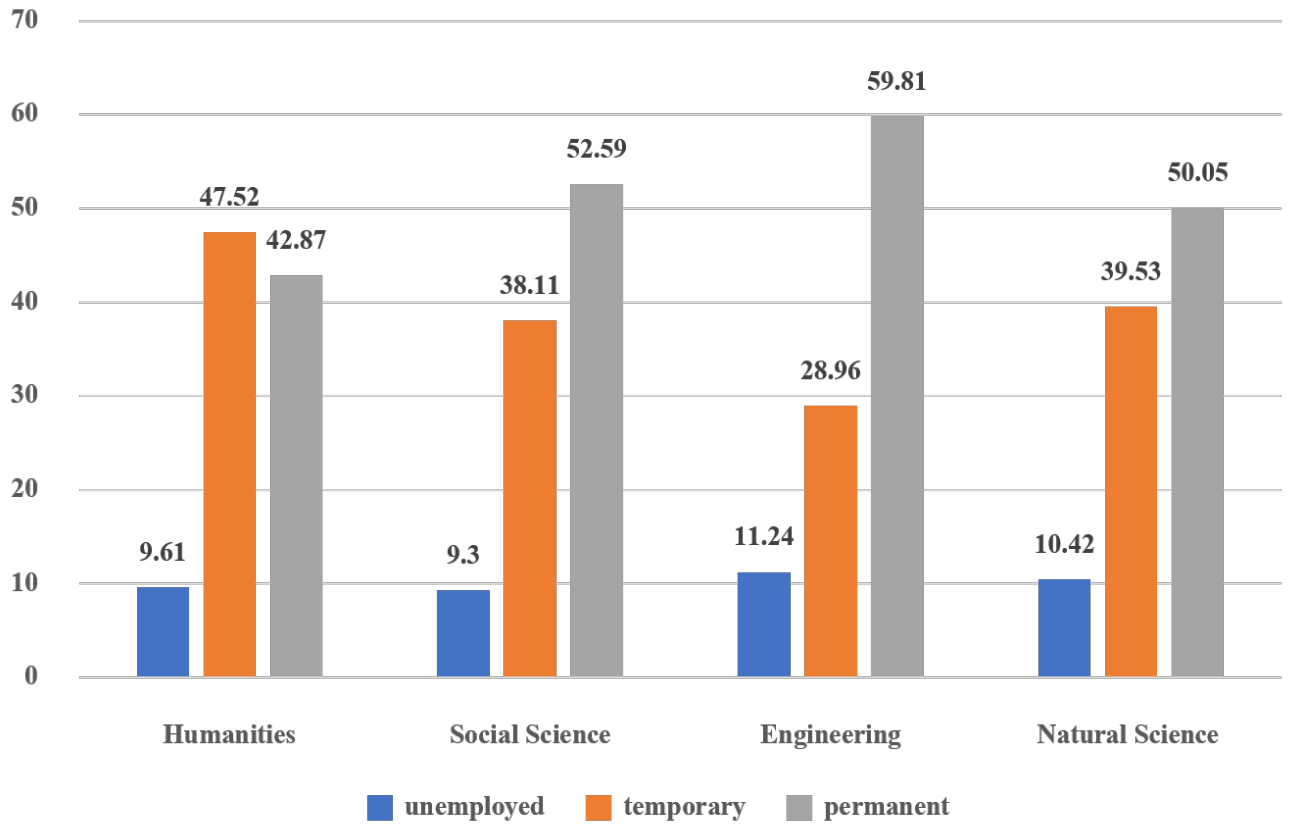


Figure: Korean TV Quiz Program

Motivation

- Figure: Employment status by fields of study
  - Unemployed: those unemployed for 12-18 months after graduation
  - Temporary: those employed with more than 1 month but less than 1 year
  - Permanent: those employed with more than 1 year (full-time)



Motivation

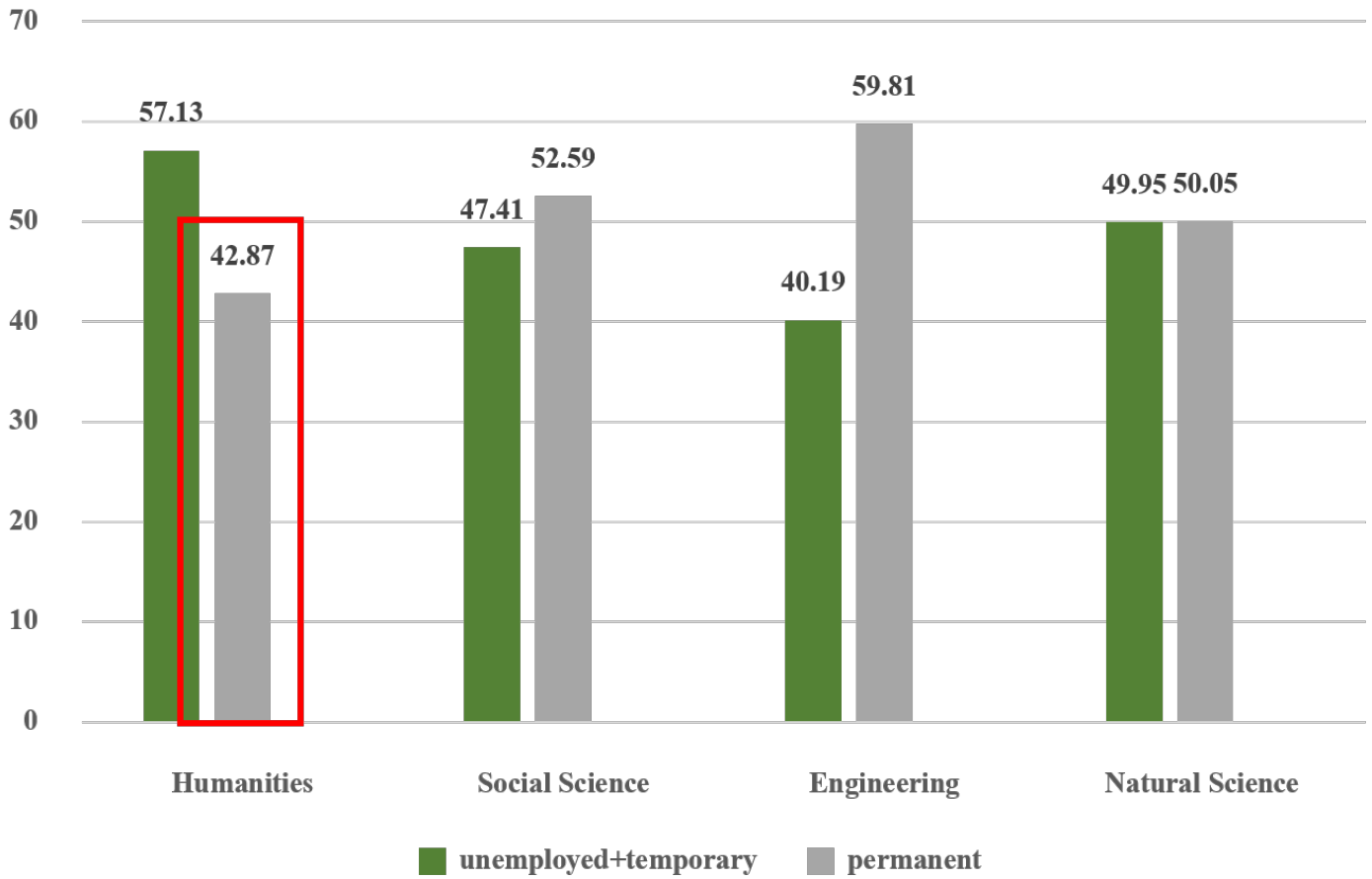


Figure: Employment status by fields of study, 2013-2016

Motivation

- 'Mun-Song' does not seem to be related to the unemployment itself.
- Rather, it seems to be related to the difficulty of getting a permanent job.
- Does this situation come from labor productivity difference or simply the name of "humanities" itself?
  - Which characteristics of the humanities affect 'Mun-song'?
  - Is it simply because of the humanities major itself?

Outline

Literature Review

- Ballarino and Bratti (2009)
  - "Field of Study and University Graduates' Early Employment Outcomes in Italy during 1995–2004," *LABOUR: Review of Labour Economics & Industrial Relations*, 2009
  - Data: 1995-2004 wave of the Graduates Employment Survey (GES), Italy
  - Analyzed how the effect of different fields of study on the university-to-work transition changed between 1995 and 2004 in Italy
  - Graduates in Humanities had less chances to be out of the labor force, but had higher probability to get unstable jobs

Literature Review

- Lee (2016)
  - "Is There a Penalty for Humanities Major?," 2016 (presented in 2016 Employment Panel Conference)
  - Data: 2012GOMS1
  - how much difference there exists in labor market performance across different fields of study

Literature Review

- What We Do
  - Analyze whether there is 'Mun-song' shown in the employment rate for permanent jobs
  - If Mun-song exists in the data, then we analyze which characteristics of the humanities affect the employment rate for permanent jobs

Outline

Data

- GOMS (Graduates Occupational Mobility Survey)
  - Data from Korea Employment Information Service(KEIS)
  - the largest short-term survey of a representative sample of Korean Graduates
  - provides the characteristics of each Korean graduates and their occupations, college data
  - started with panel data in 2004, but changed to cross-sectional survey since 2012
  - We will use GOMS data from 2013 to 2016

Outline

Model I

- Binary Logit Model
  - Estimating the probability of being in a specific group

$$\log\left(\frac{P_{Y_1}}{1-P_{Y_1}}\right) = \alpha M + \beta X + \varepsilon$$

Y_1: a class of permanently employed

Y_0: otherwise

M: dummy variables matrix of majors

X: matrix of controlled variables

P_{Y_1}: probability of being in the class Y_1

$1 - P_{Y_1}$: probability of being in the class Y_0 $(=P_{Y_0})$

  - $P_{Y_1} = \frac{f(M,X)}{1+f(M,X)}$, where $f(M,X) = \exp(\alpha M + \beta X + \varepsilon)$

Model I - Dependent variables

- Class 1: Over 1-year permanent workers on their first job
- Class 2: Under 1-year temporary workers on their first job
  + Unemployed
- Exclusion
  1. inactive graduates who have specific excuses (ex. nursing, housework, enlistment, entering graduate school etc.)
  2. age over 35
  3. 2-3 year college (community college)
  4. Medical, Arts, PE, Education majors

Model I - Independent variables

1. Major
   - Humanities, Social Science, Engineering, Natural Science
2. Personal Characteristics
   - Age, Sex, Parents' education level, Household income, Year of Graduation
3. College Characteristics
   - GPA, Type of university, Double major
4. Motivation for Employment
   - Certificate, The period of language training abroad, Work experience before graduation, Satisfaction for job training, Job plan

Model II

- Binary Logit Model

$$\log\left(\frac{P_{Y_1}}{1-P_{Y_1}}\right) = \alpha M + \beta X + \gamma H * C + \varepsilon$$

H: dummy variable of being in Humanities

C: interaction term to Humanities that affects probability of permanently employed

$$P_{Y_1} = \frac{g(M,H,C,X)}{1+g(M,H,C,X)},$$

where $g(M, H, C, X) = \exp(\alpha M + \beta X + \gamma H * C + \varepsilon)$

Outline

Empirical Results - Model I

- Base group: Social Science
- Interpretation of the coefficients: Marginal effect
- Full regression table: attached in the Appendix

Empirical Results - Model I

	Model I-1 Y	Model I-1 Y-ME
Independent variable		
Humanities (d)	-0.345***	-0.0859***
	(0.0515)	(0.0127)
Social Science (d)	(base group)	(base group)
Natural Science (d)	-0.0306	-0.00765
	(0.0489)	(0.0122)
Engineering (d)	0.291***	0.0724***
	(0.0437)	(0.0108)
age	-0.578***	-0.144***
	(0.138)	(0.0344)
age^2	0.0114***	0.00285***
	(0.00260)	(0.000650)
doublemajor (d)	0.0315	0.00788
	(0.0481)	(0.0120)
GPA	0.0438	0.0109
	(0.0358)	(0.00894)
ln(reservation wage)	-0.207**	-0.0518**
	(0.0711)	(0.0178)
constant	9.2952***	
	(1.8236)	
N	15220	15220
LR chi square	445.59***	445.59***

Marginal effects; Standard errors in parentheses
(d) for discrete change of dummy variable from 0 to 1
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Possible factors

- Even though we controlled for possible differences across individuals, the Humanities major still struggles in the job market.
- Possible factors
  1. Differences in ability
     - Reimer and Noelke (2008)
  2. Psychological factors
  3. Lack of job competitiveness

Possible factors

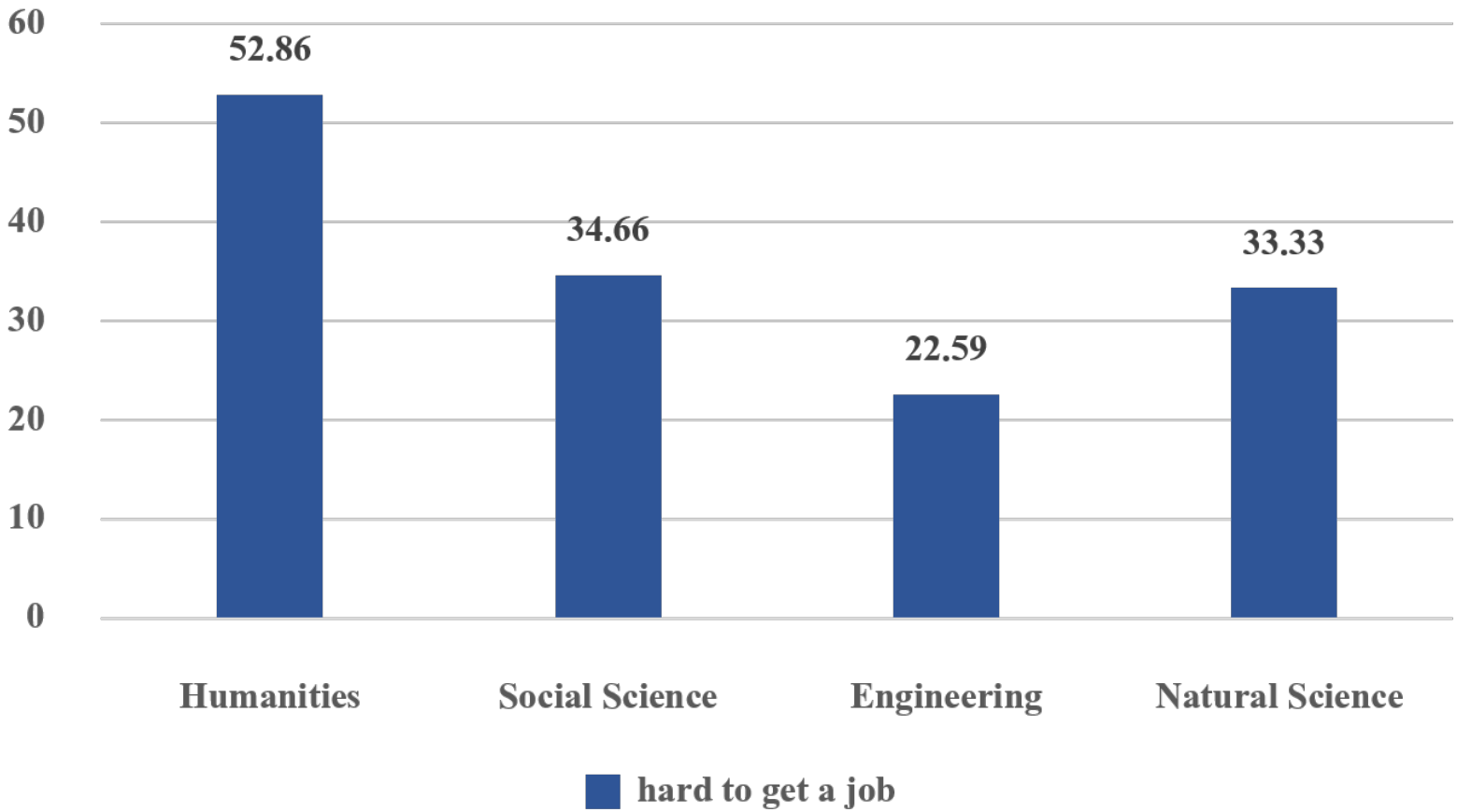
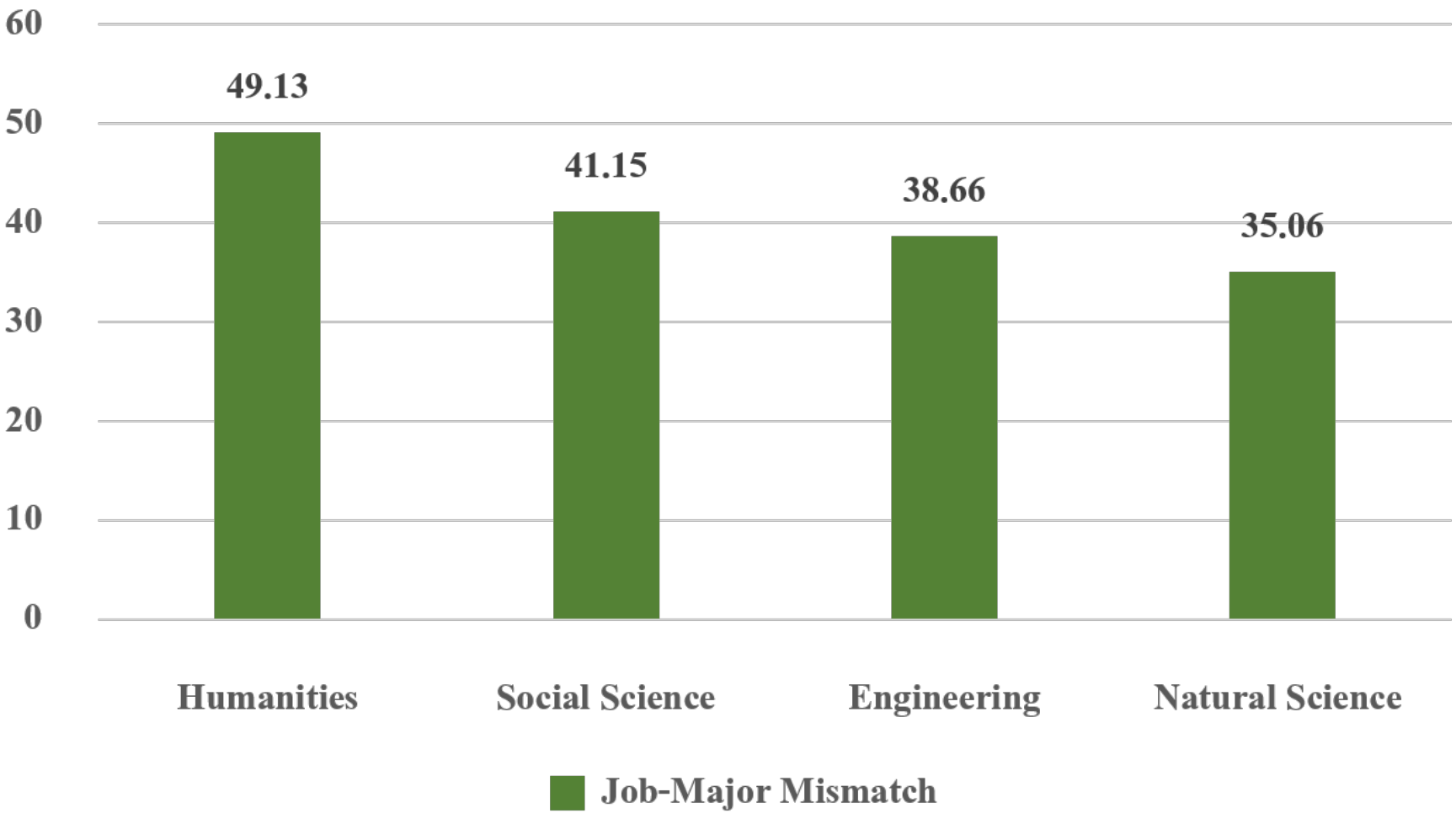
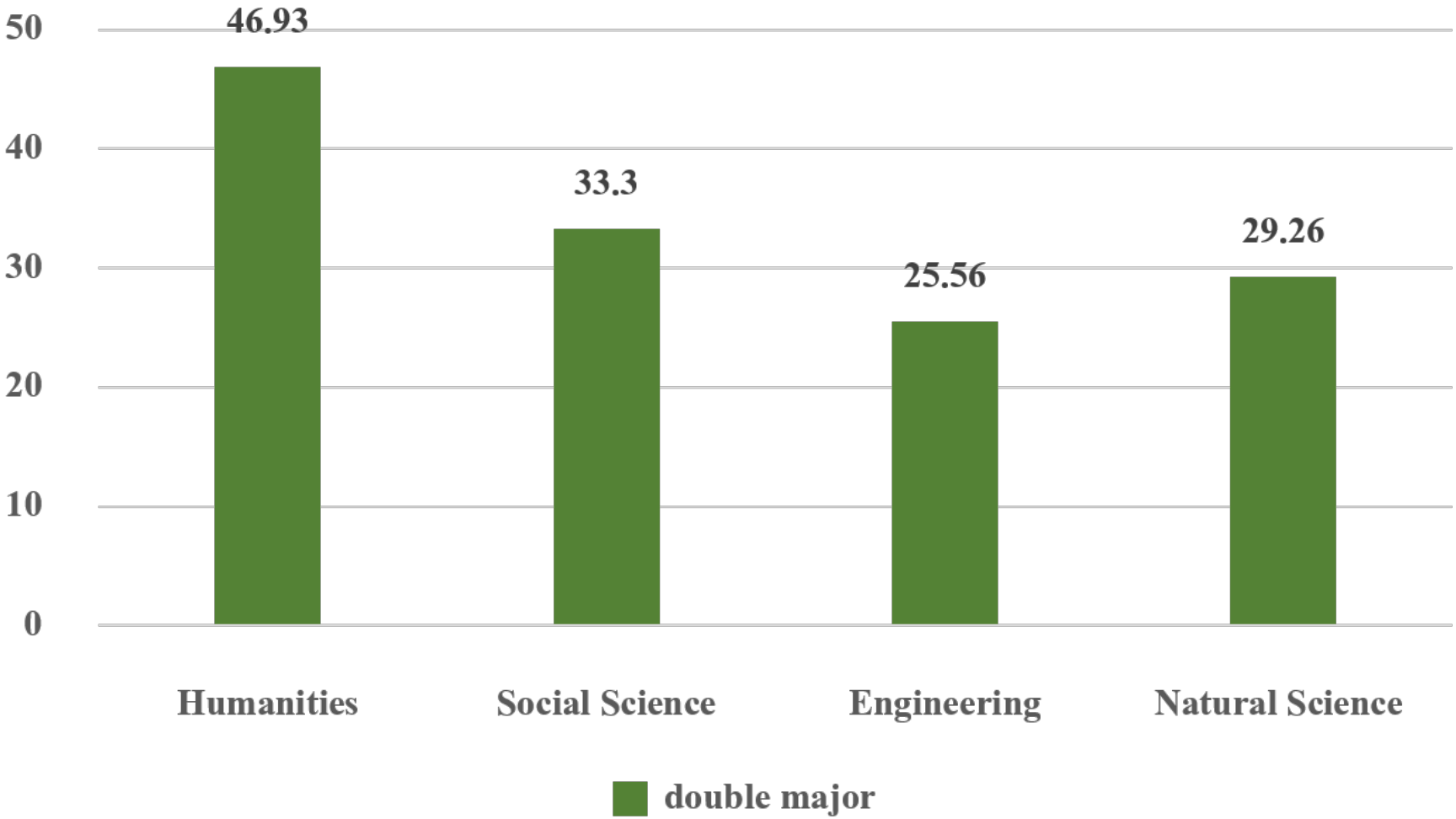


Figure:

Possible factors



Possible factors



Empirical Results - Model II

- Base group: Social Science
- Interpretation of the coefficients: Marginal effect
- Full regression table: attached in the Appendix
- Included 'double major' as an interaction term
  - Included minor
  - $=1$ if double-majored, $=0$ otherwise (regardless of fields of study)

Empirical Results - Model II

	Model II-(1) Y	Model II-(2) Y-ME
Independent variable		
Humanities (d)	-0.416***	-0.103***
	(0.0652)	(0.0160)
Social Science (d)	(Base group)	(Base group)
Natural Science (d)	-0.0317	-0.00793
	(0.0489)	(0.0122)
Engineering (d)	0.288***	0.0717***
	(0.0437)	(0.0108)
Humanities*doublemajor (d)	0.164*	0.0408*
	(0.0913)	(0.0226)
Double major (d)	-0.00929	-0.00232
	(0.0532)	(0.0133)
gage	-0.582***	-0.145***
	(0.138)	(0.0344)
gage2	0.0115***	0.00286***
	(0.00260)	(0.000650)
ln(reservation wage)	-0.211**	-0.0527**
	(0.0712)	(0.0178)
Constant	9.1668***	
	(1.8228)	
N	15220	15220
LR chi square	443.66***	443.66***

Marginal effects; Standard errors in parentheses
(d) for discrete change of dummy variable from 0 to 1
Y: the probability of being permanently employed
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Empirical Results - Model II

- Especially for Humanities, having a double major increases chances of getting a permanent job
- Consistent with Kim et al. (2015)

Outline

Conclusion

- Controlling for possible differences across individuals, the Humanities major still struggles in the job market
  - Compared to social science,
    - Humanities: -8.6%
    - Engineering: 7.2%
- For Humanities students, having a double major can increase chances of getting a job by 4.1%

Implication

Figure: Blind Hiring

Implication

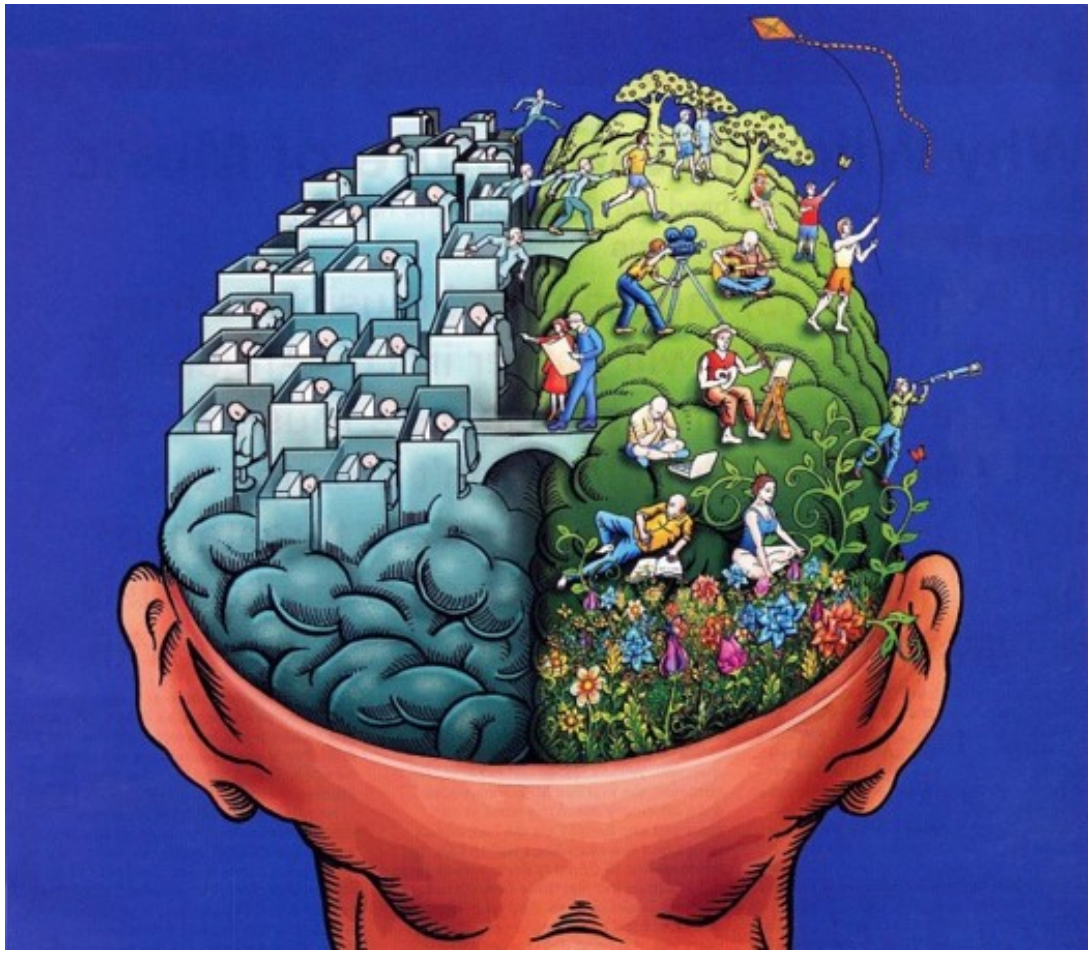


Figure: Double major

Future Research

- Different size of firms
- Multicollinearity issue
- Detailed classification of double major

Outline

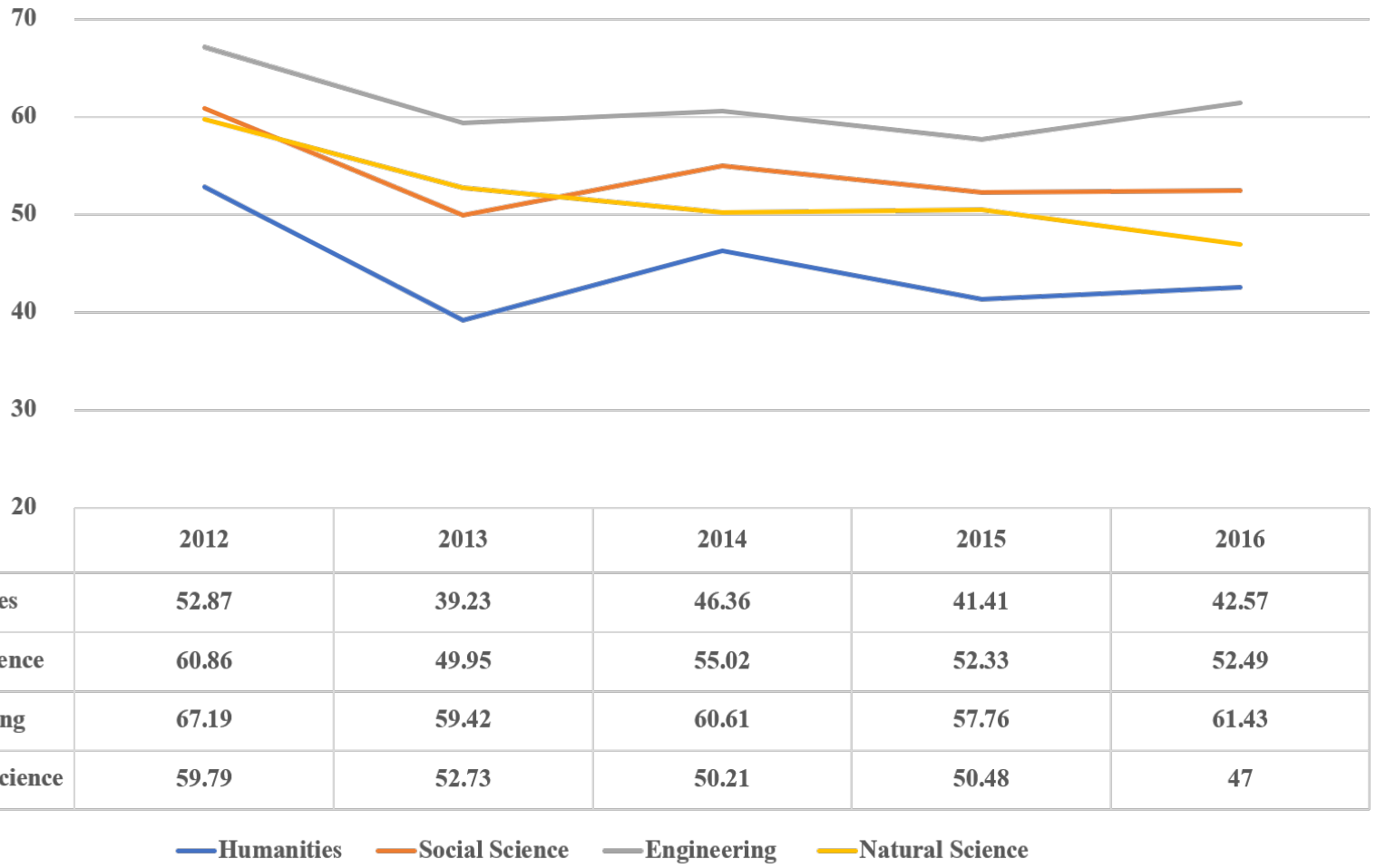
Reference

- Ballarino and Bratti, "Field of Study and University Graduates' Early Employment Outcomes in Italy during 1995–2004," *LABOUR: Review of Labour Economics & Industrial Relations*, 2009
- Jaesung Lee, "Is There a Penalty for Humanities Major?," 2016 (presented in 2016 Employment Panel Conference)
- Hoonho Kim, Hansol Woo, Hangil Kim, Byeolhee Kim, "The Influence of Dual-major Degree Program on Employment Outcomes of University Graduates," *Journal of Vocational Education and Training*, 2015
- BoMin Kim, Daeyeon Cho, Hyung-Jai Choi, "Effects of Delayed Graduation on Employment and Wage," *Journal of Vocational Education and Training*, 2018

THANK YOU!

Outline

Appendix



	2012	2013	2014	2015	2016
Humanities	52.87	39.23	46.36	41.41	42.57
Social Science	60.86	49.95	55.02	52.33	52.49
Engineering	67.19	59.42	60.61	57.76	61.43
Natural Science	59.79	52.73	50.21	50.48	47

Figure: Permanent employment rate by fields of study (2012-2016)

Appendix - Independent variables

Major (dummy)	**Humanities**	**College Characteristics**	**GPA**	
	Social Science		**Type of Foundation**	**National college in Metropolitan area**
	Engineering			**Privation college in Metropolitan area**
	Natural Science			**National college in non-metropolitan area**
Personal Characteristics	**Age(under 35 years old)**			**Private college in non-metropolitan area**
	Sex(female=1)	**Motivation for employment**	**Double major**	
	Father's education level		**Job plan before graduation**	
	Mother's education level		**Job training**	
	Household Income(4 intervals)		**Satisfaction for career education**	
	Year of graduation(2012-2015)		**Period of language training abroad**	
	Reservation wage		**Certificate**	

Figure: Independent variables

Appendix - Descriptive Statistics for dummy variables

Descriptive Statistics for dummy variables

		Major				
		Humanities	Social Science	Engineering	Natural Science	Total
Dependent Variable	Permanently Employed	1062	2222	3098	1384	7766
		42.87%	52.59%	59.81%	50.05%	53.02%
	Otherwise	1415	2003	2082	1381	6881
		57.13%	47.41%	40.19%	49.95%	46.98%
Gender	Male	820	1939	4142	1234	8135
		33.10%	45.89%	79.96%	44.63%	55.54%
	Female	1657	2286	1038	1531	6512
		66.90%	54.11%	20.04%	55.37%	44.46%
Graduation Year	2012	92	139	154	71	456
		3.71%	3.29%	2.97%	2.57%	3.11%
	2013	491	863	1133	534	3021
		19.82%	20.43%	21.87%	19.31%	20.63%
	2014	640	1032	1250	733	3655
		25.84%	24.43%	24.13%	26.51%	24.95%
	2015	632	1116	1305	731	3784
		25.51%	26.41%	25.19%	26.44%	25.83%
	2016	622	1075	1338	696	3731
		25.11%	25.44%	25.83%	25.17%	25.47%
Double Major	Yes	1167	1405	1317	806	4695
		47.11%	33.25%	25.42%	29.15%	32.05%
	No	1310	2820	3863	1959	9952
		52.89%	66.75%	74.58%	70.85%	67.95%
Job Experience Before Graduation	Yes	1667	2704	3027	1768	9166
		67.30%	64.00%	58.44%	63.94%	62.58%
	No	810	1521	2153	997	5481
		32.70%	36.00%	41.56%	36.06%	37.42%
Specific Job Plan Before Graduation	Yes	1108	1924	2196	1270	6498
		44.73%	45.54%	42.39%	45.93%	44.36%
	No	1369	2301	2984	1495	8149
		55.27%	54.46%	57.61%	54.07%	55.64%
Certificate	Yes	1401	2688	3111	1765	8965
		56.56%	63.62%	60.06%	63.83%	61.21%
	No	1076	1537	2069	1000	5682
		43.44%	36.38%	39.94%	36.17%	38.79%
Total	N	2477	4225	5180	2765	14647
	proportion	16.91%	28.85%	35.37%	18.88%	100.00%

First row has *frequencies* and second row has *column percentages*

Appendix - Descriptive Statistics for dummy variables

Descriptive Statistics for dummy variables

		Major				
		Humanities	Social Science	Engineering	Natural Science	Total
Family Income	below 200	393	688	884	407	2372
		15.87%	16.28%	17.07%	14.72%	16.19%
	between 200 and 300	483	811	1088	472	2854
		19.50%	19.20%	21.00%	17.07%	19.49%
	between 300 and 500	994	1822	2132	1240	6188
		40.13%	43.12%	41.16%	44.85%	42.25%
	above 500	607	904	1076	646	3233
		24.51%	21.40%	20.77%	23.36%	22.07%
Type of Foundation of College	National College in Metropolitan Areas	53	117	265	158	593
		2.14%	2.77%	5.12%	5.71%	4.05%
	Private College in Metropolitan Areas	1200	1910	1840	956	5906
		48.45%	45.21%	35.52%	34.58%	40.32%
	National College in Non-Metropolitan Areas	87	86	271	216	660
		3.51%	2.04%	5.23%	7.81%	4.51%
	Private College in Non-Metropolitan Areas	339	646	666	296	1947
		13.69%	15.29%	12.86%	10.71%	13.29%
Total	N	2477	4225	5180	2765	14647
	proportion	16.91%	28.85%	35.37%	18.88%	100.00%

First row has *frequencies* and second row has *column percentages*

Appendix - Descriptive Statistics for discrete and continuous variables

Descriptive statistics for discrete and continuous variables : Mean Only

	Major				
	Humanities	Social Science	Engineering	Natural Science	Total
GPA	3.634	3.629	3.553	3.577	3.593
Satisfaction for career education	1.951	1.936	1.865	1.978	1.921
Age	25.894	25.777	26.205	25.646	25.923
Reservation wage	2431.223	2442.71	2632.045	2499.428	2518.434
Period of language training abroad	2.136	1.15	0.687	0.733	1.074
Father's education	3.824	3.626	3.497	3.723	3.632
Mother's education	3.442	3.293	3.181	3.331	3.286

Appendix - Model I full regression table

	Model I-(1) Y	Model I-(2) Y-ME
Independent variable		
Humanities (d)	-0.345***	-0.0859***
	(0.0515)	(0.0127)
Social Science (d)	(Base group)	(Base group)
Natural_Science (d)	-0.0306	-0.00765
	(0.0489)	(0.0122)
Engineering (d)	0.291***	0.0724***
	(0.0437)	(0.0108)
ggrad_2012 (d)	0.0291	0.00726
	(0.111)	(0.0276)
ggrad_2013 (d)	-0.0649	-0.0162
	(0.0619)	(0.0155)
ggrad_2014 (d)	-0.0271	-0.00677
	(0.0466)	(0.0116)
ggrad_2015 (d)	0.108*	0.0269*
	(0.0462)	(0.0115)
gage	-0.578***	-0.144***
	(0.138)	(0.0344)
gage2	0.0114***	0.00285***
	(0.00260)	(0.000650)
gsex (d)	-0.147***	-0.0368***
	(0.0425)	(0.0106)
doublemajor (d)	0.0315	0.00788
	(0.0481)	(0.0120)
father_edu	-0.0751***	-0.0188***
	(0.0167)	(0.00418)
mother_edu	-0.0687***	-0.0172***
	(0.0197)	(0.00493)
jobbfgrad (d)	0.0787*	0.0197*
	(0.0349)	(0.00871)
jobplan (d)	-0.186***	-0.0465***
	(0.0341)	(0.00850)
certificate (d)	0.0665	0.0167
	(0.0343)	(0.00858)
inc_below200 (d)	-0.0541	-0.0135
	(0.0554)	(0.0138)
inc_300500 (d)	0.0791	0.0198

Appendix - Model II full regression table

	(0.0454)	(0.0113)
inc_above500 (d)	0.225***	0.0561***
	(0.0533)	(0.0132)
GPA	0.0438	0.0109
	(0.0358)	(0.00894)
PrivatenonM (d)	0.199***	0.0495***
	(0.0495)	(0.0122)
NationalM (d)	-0.164	-0.0409
	(0.0842)	(0.0210)
NationalnonM (d)	-0.134	-0.0335
	(0.0801)	(0.0200)
stf_careeredu	-0.0124	-0.00309
	(0.0125)	(0.00312)
periodabroad	0.0131**	0.00326**
	(0.00487)	(0.00122)
ln(reservationwage)	-0.207**	-0.0518**
	(0.0711)	(0.0178)
constant	9.2952***	
	(1.8236)	
N	15220	15220
LR chi square	445.59***	445.59***

Marginal effects; Standard errors in parentheses
(d) for discrete change of dummy variable from 0 to 1
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix - Descriptive Statistics of GPA

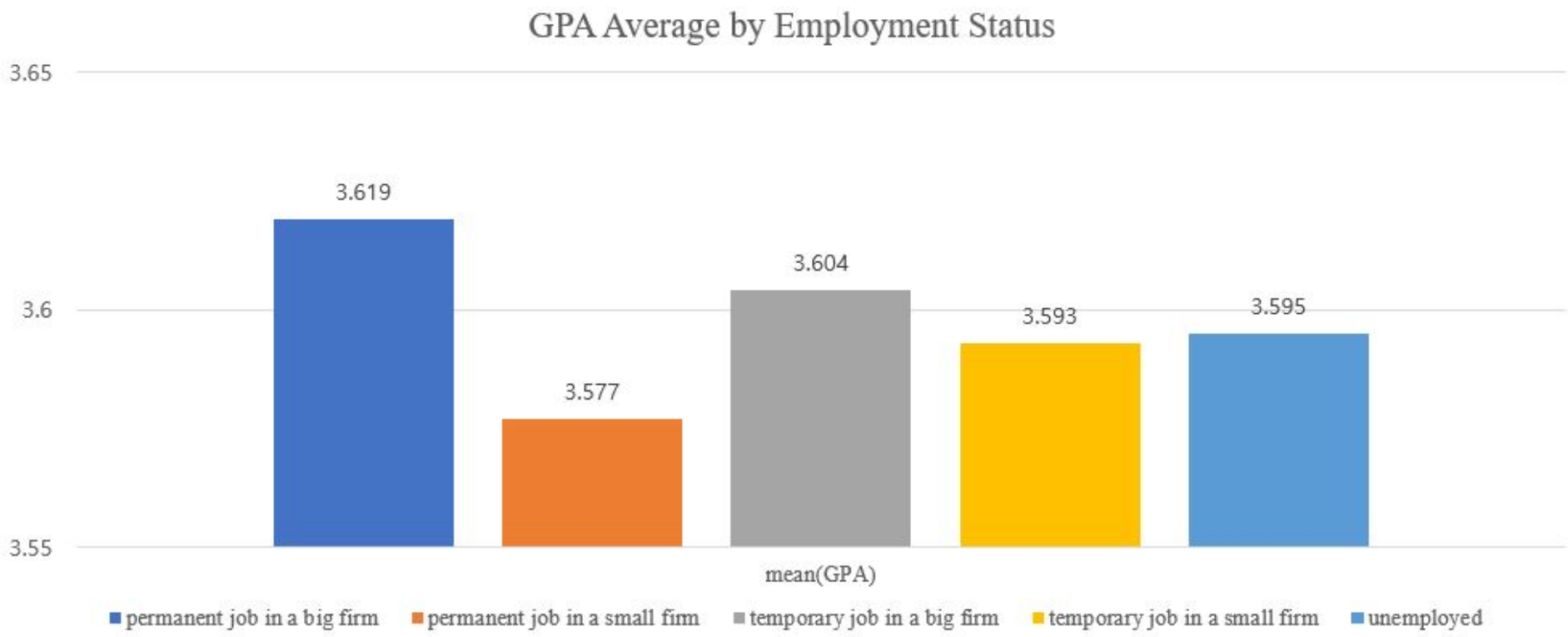


Table: Average GPA by Employment Status

Appendix - Model II full regression table

	Model II-(1) Y	Model II-(2) Y-ME
Independent variable		
Humanities (d)	-0.416***	-0.103***
	(0.0652)	(0.0160)
Social Science (d)	(Base group)	(Base group)
Natural Science (d)	-0.0317	-0.00793
	(0.0489)	(0.0122)
Engineering (d)	0.288***	0.0717***
	(0.0437)	(0.0108)
Humanities*doublemajor (d)	0.164*	0.0408*
	(0.0913)	(0.0226)
doublemajor (d)	-0.00929	-0.00232
	(0.0532)	(0.0133)
ggrad_2012 (d)	0.0413	0.0103
	(0.111)	(0.0276)
ggrad_2013 (d)	-0.0515	-0.0129
	(0.0624)	(0.0156)
ggrad_2014 (d)	-0.0259	-0.00646
	(0.0466)	(0.0116)
ggrad_2015 (d)	0.109*	0.0272*
	(0.0462)	(0.0115)
gage	-0.582***	-0.145***
	(0.138)	(0.0344)
gage2	0.0115***	0.00286***
	(0.00260)	(0.000650)
gsex (d)	-0.148***	-0.0369***
	(0.0425)	(0.0106)
father_edu	-0.0753***	-0.0188***
	(0.0167)	(0.00418)
mother_edu	-0.0690***	-0.0172***
	(0.0197)	(0.00493)
jobbfgrad (d)	0.0783*	0.0196*
	(0.0349)	(0.00871)
jobplan (d)	-0.186***	-0.0464***
	(0.0341)	(0.00850)
certificate (d)	0.0654	0.0163
	(0.0343)	(0.00858)
inc_below200 (d)	-0.0546	-0.0137

Appendix - Model II full regression table

	(0.0554)	(0.0138)
inc_300500 (d)	0.0774	0.0193
	(0.0455)	(0.0114)
inc_above500 (d)	0.224***	0.0559***
	(0.0533)	(0.0132)
PrivatenonM (d)	0.199***	0.0496***
	(0.0495)	(0.0122)
NationalM (d)	-0.163	-0.0406
	(0.0842)	(0.0210)
NationalnonM (d)	-0.136	-0.0339
	(0.0801)	(0.0200)
GPA	0.0435	0.0109
	(0.0358)	(0.00895)
stf_careeredu	-0.0133	-0.00333
	(0.0125)	(0.00312)
periodabroad	0.0130**	0.00324**
	(0.00487)	(0.00122)
ln(reservationwage)	-0.211**	-0.0527**
	(0.0712)	(0.0178)
Constant	9.1668***	
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LR chi square	443.66***	443.66***

Marginal effects; Standard errors in parentheses
(d) for discrete change of dummy variable from 0 to 1
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$