Empirical Analysis of Mobility of High-Educated Workers

: Focused on Brain Drain of Non-Seoul-Metropolitan Area

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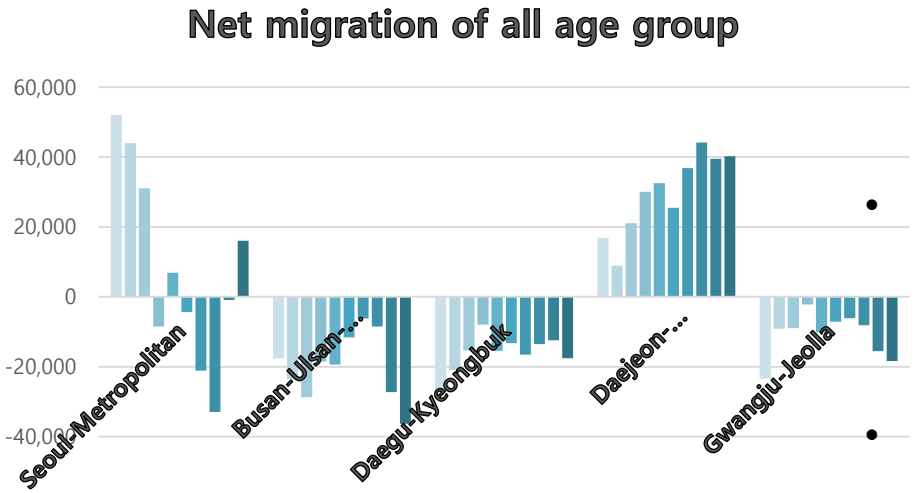
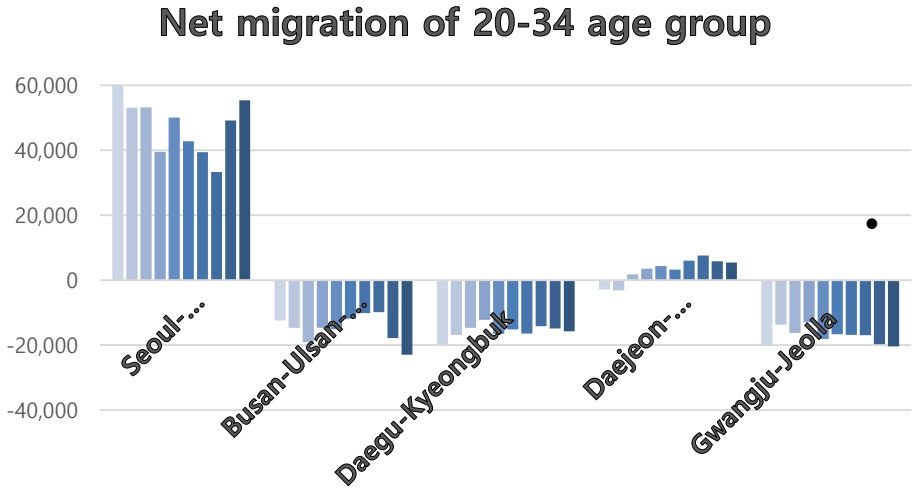
I. Introduction

1.1 Background (1)

- **Seoul-Metropolitan Area**
  - Seoul : The Capital City of Republic of Korea
  - Extent : **12%** of total (11,840km^2 / 100,363km^2)
  - Population : **50%** of total (25.68 mil / 51.63 mil)
  - University : **37%** of total (71 / 191)
  - Students of Univ. : **38%** of total (0.79 mil / 2.03 mil)
  - Economically Active Population : **50%** of total (13.96 mil / 27.75 mil)

1.1 Background (2)





- Most area except SMA and Chungcheong area
  : a steady net outflow of population
- 20-34 age group
  : net migration is very large
  : the movement for education and job
- The migration of high-educated worker
  : tend to locate areas where can earn high wages
  : may result in regional disparity in human resources

1.2 Goal of paper

- **How to explain migration young workers**
  : Brain Drain
  -1st Brain Drain : the movement for the education
  -2nd Brain Drain : the movement for the job

- **If graduate moving to SMA for the education before(the first brain drain) coming back to NSMA, regional disparity of human resources is not serious**
  -To analyze whether the 1st or 2nd brain drain occur more seriously
  -To find what factors influence the movement to the SMA

II. Literature Review

2. Literature Review (1)

- Job Mobility & Regional Disparity

- International vs. Interregional

Type	Effects	Literatures
International	Negative	Thomas(1967), Romans(1974)
	Positive	Mountford(1997), Stark et al(1997, 2002)
Interregional	Negative	Lim(1986), Lim et al(1997), Kim et al(2003), Moon(2010)

2. Literature Review (2)

- Determinant of Mobility

- Seoul-Metropolitan area vs. Non-Seoul-Metropolitan area

Type	Determinants	Literatures
1st Brain Drain	Gender, Income of household	Kwon(2001), Kwon(2003), Kim et al(2012), Kim et al(2013), Ryu(2015), Hong(2016), Lee et al(2016), Moon et al(2017)
2nd Brain Drain	Gender, GPA, Major, Certificate	

III. Data & Methodology

3.1 Data (1)

- **Graduate Occupational Mobility Survey(GOMS)**
  - Created by “the Korea Employment Information Service”
  - The population of data is graduates of universities
    (2~3-year college, university of education, four-year university)
  - 18,000 samples each year
  - Questions about the first job after graduating and the current job
  - Include questions about educational and personal characteristics

3.1 Data (2)

Type		Variable	Characteristic	Detail
Explained		NSMA Job	Dummy	**Non-Seoul-Metropolitan Area Job = 1**
Explanatory	Personal Characteristics	Gender	Dummy	Female = 1, Male = 0
		Age	Discrete	Groups under 35
		Cert	Discrete	Number of Certification
		Lang. Ex.	Dummy	Language training experience while attending college = 1
		Job Ex.	Dummy	Job experience while attending college = 1
	Educational Characteristics	SMA graduate	Dummy	Graduate from SMA = 1
		College	Dummy	College graduate = 1
		Univ. of Edu.	Dummy	Univ. of Edu. graduate = 1
		Univ.	Dummy	University graduate = 1
		GPA	Discrete	4.0, 4.3, 4.5 translate by 4.5
		Humanity	Dummy	Humanity major = 1
		Social Science	Dummy	Social Science major = 1
		Natural Science	Dummy	Natural Science major = 1
		Engineering	Dummy	Engineering major = 1
		Education	Dummy	Education major = 1
		Medicine	Dummy	Medicine major = 1
		Art, Music & Physical	Dummy	Art, Music & Physical major = 1

3.1 Data (3)

Variable		Obs.	Mean	Std. dev.	Min	Max
NSMA Job		6,291	**0.7078**	0.4548	0	1
Age		6,291	28.6404	2.1386	24	35
Gender		6,291	**0.4322**	0.4954	0	1
Cert		6,291	1.2073	1.3955	0	21
Job Ex.		6,291	0.2224	0.4159	0	1
Lang. Ex.		6,291	0.1052	0.3069	0	1
Type of school	College	6,291	0.2477	0.4317	0	1
	Univ. of Edu.	6,291	0.0375	0.1900	0	1
	University	6,291	**0.7148**	0.4515	0	1
GPA		6,291	3.6799	0.4029	0	4.5
Type of major	Humanity	6,291	0.0882	0.2836	0	1
	Social Science	6,291	0.1747	0.3797	0	1
	Education	6,291	0.0976	0.2968	0	1
	Engineering	6,291	0.3022	0.4592	0	1
	Natural Science	6,291	0.1426	0.3497	0	1
	Medicine	6,291	0.0904	0.2868	0	1
	Art, Music & Physical	6,291	0.1043	0.3056	0	1
SMA graduate		6,291	**0.1863**	0.3894	0	1

3.2 Methodology (1)

Our empirical model is based on previous literatures

$$Movement = f(E, P)$$

$$E = (type, GPA, major)$$

$$P = (gender, age, cert, ex)$$

Hypothesis 1 : E vector is positively relationship with movement to SMA

Hypothesis 2 : gender & age are negatively relationship with migration

3.2 Methodology (2)

- To use **Logit model**
- Explained variable

  High school graduate from NSMA in got a job in NSMA

  after graduating college = 1

$$Y = \log\left(\frac{P_i}{1-P_i}\right) = \alpha + E'\beta + P'\gamma + \varepsilon$$

$\boldsymbol{P_i}$ = **Prob of working in NSMA**, E, P = Vector of explanatory variables

IV. Empirical Result

4. Empirical Result (1)

Variable			Model 1 (all graduates)		Model 2 (four-year graduates only)	
			Coef. (Std. Dev.)	Marginal Effect	Coef. (Std. Dev.)	Marginal Effect
Characteristics of Education		GPA	-.2728*** (.1032)	-.0397	-.1367 (.1176)	-.0221
		SMA graduate	**-2.4926*** (.1014)**	**-.3625**	**-2.4759*** (.1166)**	**-.3994**
	Major	University graduate	**-.7288*** (.0894)**	**-.1059**		
		Social Science			.0150 (.1446)	.0024
		Education			.6211*** (.2019)	.1002
		Engineering			-.0108 (.1375)	-.0017
		Natural Science			.1733 (.1515)	.0279
		Medicine			-.6794*** (.1764)	-.1096
		Art, Music & Physical			-.4726*** (.1617)	-.0762

4. Empirical Result (2)

Variable		Model 1 (all graduates)		Model 2 (four-year graduates only)	
		Coef. (Std. Dev.)	Marginal Effect	Coef. (Std. Dev.)	Marginal Effect
Characteristic of Individual	Gender	**.6955** (.6912)	**.1012**	**1.3050*** (.7911)	**.2105**
	Age	.0007 (.0208)	.0001	-.0165 (.0249)	-.0027
	Cert	.0404 (.0247)	.0059	.0227 (.0274)	.0037
	Lang. ex.	**-.2498**** (.1044)	**-.0363**	**-.2645**** (.1107)	**-.0427**
	Job ex.	**-.2626***** (.0774)	**-.0382**	**-.3444***** (.0874)	**-.0556**
Factor of female	GPA	-.1287 (.1830)	-.0187	-.3014 (.2104)	-.0486
	SMA graduate	**-1.073***** (.1777)	**-.1561**	**-.6954***** (.2027)	**-.1122**

V. Conclusion

5. Conclusion

- **Analysis of whether the return to NSMA occurs according to gender**

  -Women are less likely to work in the SMA than men.

  : 10%(all graduates), 21%(university graduates)

  -Women who graduated from the SMA return to the NSMA to get a job less likely than men who graduated from the SMA

  : 15%(all graduates), 11%(university graduates)

- **The reason why women return to the NSMA less likely than men**

  -Transaction cost of women is higher than that of men

  -Wage discrimination of gender is less in the SMA than in the NSMA

Thanks!

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