

2022 National CGE Workshop
Victoria University, Melbourne, Australia

A CGE Analysis of the Basic Income Scenario in South Korea

17 October 2022

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I. Introduction

According to the '2021 Senior Statistics' (released on 29 Sep. 2022) by the Ministry of Health and Welfare (MOHW) in South Korea,

- the number of elderly people aged 65 and over reached 8.537 million in 2021, accounting for 16.5% of the total population.
- If this trend continues, 4 years later, in 2025, the elderly population will account for 20.3% of the total population, entering a super-aged society, and
- it is expected to reach 30.5% by 2036.

The number of the elderly who is living alone exceeded 1.66 million as of last year, and the proportion of single-person elderly households among the total elderly households reached a new high of 35.1%.

- Among elderly households living alone, those in their 70s accounted for the highest proportion at 44.1%, and
- by gender, women accounted for 71.9%.

Statistics Korea projected that the number of elderly households living alone will continue to increase. It is expected to double in 2037 to 3.35 million households and to reach 4.05 million households in 2047.

As of 2019, the life expectancy of a 65-year-old survivor is 21.3 years (19.1 years for men and 23.4 years for women).

- This means that a 65-year-old man can live to 84.1 years old and a woman to 88.4 years old.
- Compared to the average of OECD (Organization for Economic Cooperation and Development) member countries, men are 0.8 years longer and women 1.8 years longer.

Although the income distribution indicator for the retirement age group (66 years and older) has improved since 2016, the relative poverty rate as of 2019 was still high at 43.2%.

- This is the highest level among member countries of the Organization for Economic Cooperation and Development (OECD).

The current system provides a monthly basic pension of 300,000 won (300 AUD) to the bottom 70% of the elderly based on their income level

Alternatively, we might think of

- (1) 400,000 won per month for the bottom 70% seniors and 200,000 won for the top 30% seniors
- (2) Monthly payment of 300,000 won to the top 30% of seniors who are excluded from the current system
- (3) 400,000 won per month is paid only to the bottom 70% of the elderly

OR, we might provide additional 300,000 won/mo. to the aged as basic income

II. TERM-KOR Model and Database

We need to have good tool to analyze the effects of proposed policy

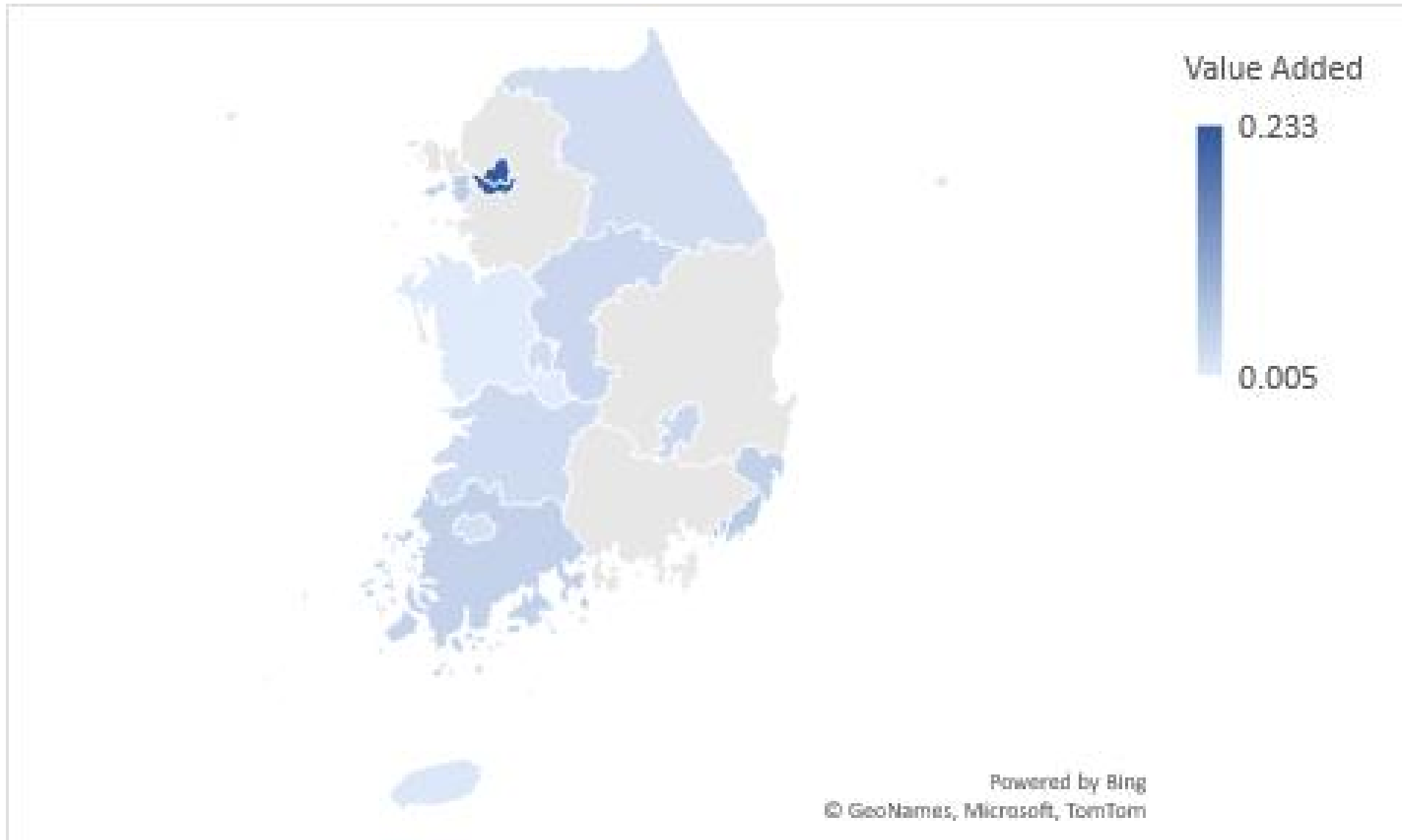
- TERM Model for Korea (TERM-KOR) is used. Its quforite new model and less than one year old.

TERM-KOR has 33 COM(or IND), 17 REG and 10 HOU types, but aggregated to 16 COM/IND, 17 REG, and 10 HOU types

2015 Input Output Table and Supply Use Table are available to compile the National Database.

- Updated to 2020 at a later stage

Value-Added by Region



A. TERM Model Database

(unit: trillion won)

		1	2	3	4	5	6
		IntInput $I \times R$	Invest $I \times R$	HouCon $H \times R$	Expo $1 \times R$	GovCon $1 \times R$	STK $1 \times R$
BAS-Domestic	$C \times S \times R$	1,597.0	378.6	601.8	695.2	250.1	5.9
BAS-Imported		442.5	55.3	68.8	2.1	0.0	0.7
MAR-Domestic	$C \times S \times M \times R$	86.4	10.3	70.7	19.7	0.0	0.0
MAR-Imported		24.0	1.4	8.3	0.1	0.0	0.0
TAX-Domestic	$C \times S \times R$	35.4	33.0	47.8	0.0	0.0	0.3
TAX-Imported		10.7	2.3	7.4	0.0	0.0	0.1
1LAB (Comp. Empl.)	$1 \times R$	750.2					
1CAP (Oper. Surplus)	$1 \times R$	751.1					
1OCT (Other Costs)	$1 \times R$	19.6					
Sum		3,717.0	481.0	804.8	717.0	250.1	8.6

Sectors

	Code	Abbreviation	Description
1	A	AgriForFish	Agriculture, Forest, Fishing
2	B	MineQuar	Mining and Quarrying
3	C	Manufact	Manufacturing (C1-C14)
4	O	PADSS	Public Admn, Defense, Social Security
5	P	Education	Education
6	Q	HealSocCare	Health, and Social Care
7	D, E	EGW	Electricity, Gas, Water, Waste Disposal
8	F	Construct	Construction
9	G	Trade	Wholesale and Retail Trade
10	H	Transport	Transport Services
11	I	FoodSvcAcc	Foods, and Accommodation
12	J	CommBroad	Communication and Broadcasting
13	K	FinanInsur	Finance and Insurance
14	L	RealEstate	Real Estate
15	M, N	ProfBusiness	Professional Business Services
16	R, S, T	ArtSportsOth	Arts, Sports, NEC

B. Scenario setting

(unit: trillion won, 1000 person, %)

No	Region name	GRDP (tril.)	Pop (1,000)	Pop65+ (1,000)	Sh. P65+ (%)	Basic Inc. (tril.)	Shock (%)
0	National	1,936.0	51,781	8,537	16.5	30.7	1.59
1	Seoul	440.3	9,602	1,549	16.2	5.6	1.27
2	Pusan	91.7	3,344	655	19.8	2.4	2.57
3	Daegu	58.0	2,419	407	16.9	1.5	2.53
4	Incheon	90.0	2,951	422	14.3	1.5	1.69
5	Kwangju	41.6	1,488	213	14.4	0.8	1.84
6	Daejeon	44.1	1,500	217	14.6	0.8	1.77
7	Ulsan	68.6	1,140	147	12.9	0.5	0.77
8	Sejong	12.7	349	35	9.6	0.1	0.99
9	Kyeonggi	486.7	13,405	1,823	13.5	6.6	1.35
10	Kangwon	48.8	1,515	316	20.9	1.1	2.33
11	Chungbuk	71.3	1,632	290	17.7	1.0	1.46
12	Chungnam	114.0	2,204	406	18.3	1.5	1.28
13	Jeonbuk	53.2	1,792	381	21.4	1.4	2.58
14	Jeonnam	78.1	1,764	417	23.8	1.5	1.92
15	Kyeongbuk	105.3	2,655	570	21.5	2.1	1.95
16	Kyeongnam	112.1	3,350	582	17.4	2.1	1.87
17	Jeju	19.5	670	106	15.7	0.4	1.96

C. Short-run Closure and shocks

In the CMF file, we have

Automatic closure + Swap for short-run

! Swaps for short-run closure

! Old exog New exog

swap invslack = NatMacro("RealInv"); *! Real investment is exogenous*

swap xhouhtot = fhou; *! Consumption follows wage income, by reg*

swap flab_i = flabsupA; *! Switch off regional wage diffs*

swap labslack = flabsup_id; *! Switch off national labour supply mech*

and policy shocks added

Shock fhou(HOU,"Seoul") = uniform 1.27;

Shock fhou(HOU,"Pusan") = uniform 2.57;

Shock fhou(HOU,"Daegu") = uniform 2.53;

etc.

(Why?) In the TAB file, we have the following:

Variable

(all,h,HOU)(all,d,DST) **fhou(h,d)**

Regional propensity to consume from labour income

houslack *# Consumption slack variable to accommodate national constraint #*

Equation **E_fhou** (all,h,HOU)(all,d,DST)

! whouhtot(h,d) = winc_fi(h,d) + fhou(h,d) + houslack; !

whouhtot(h,d) = **wlab_io(d)** + **fhou(h,d)** + **houslack**;

- Therefore, the shock of basic income strengthens nominal household consumption (just like labour income)

III. Simulation Results

A. National Results

No.	National Macro. Var.	Description	pch.
1	RealHou	Real Household Consumption	1.9
2	RealInv	Real Investment	0
3	RealGov	Real Government Consumption	0
4	ExpVol	Exports, Volume	-0.35
5	ImpVolUsed	Imports Volume, Used	0.4
6	ImpsLanded	Imports Volume, Landed	0.4
7	RealGDP	Real GDP	0.62
8	AggEmploy	Aggregate Employment	0.27
9	realwage_io	Real Wage, CPI deflated	0
10	plab_io	Nominal Wage	0.83
11	AggCapStock	Aggregated Capital Stock	0
12	GDPPI	GDP Deflator	0.67
13	CPI	Consumer Price Index	0.85
14	ExportPI	Export Price Index	0.14
15	ImpsLandedPI	Imports landed Price Index	0
16	Population	Population	0
17	NomHou	Nomnal Household Consumption	2.76
18	NomGDP	Nominal GDP	1.3

Decompositions: GDP breakdown (contxnatgdpexp)

Real

1. HOUCON : 0.90

2. INVEST : 0

3. GOVCON : 0

4. STK : 0

5. EXP : -0.14

6. IMP : -0.14

SUM = 0.62

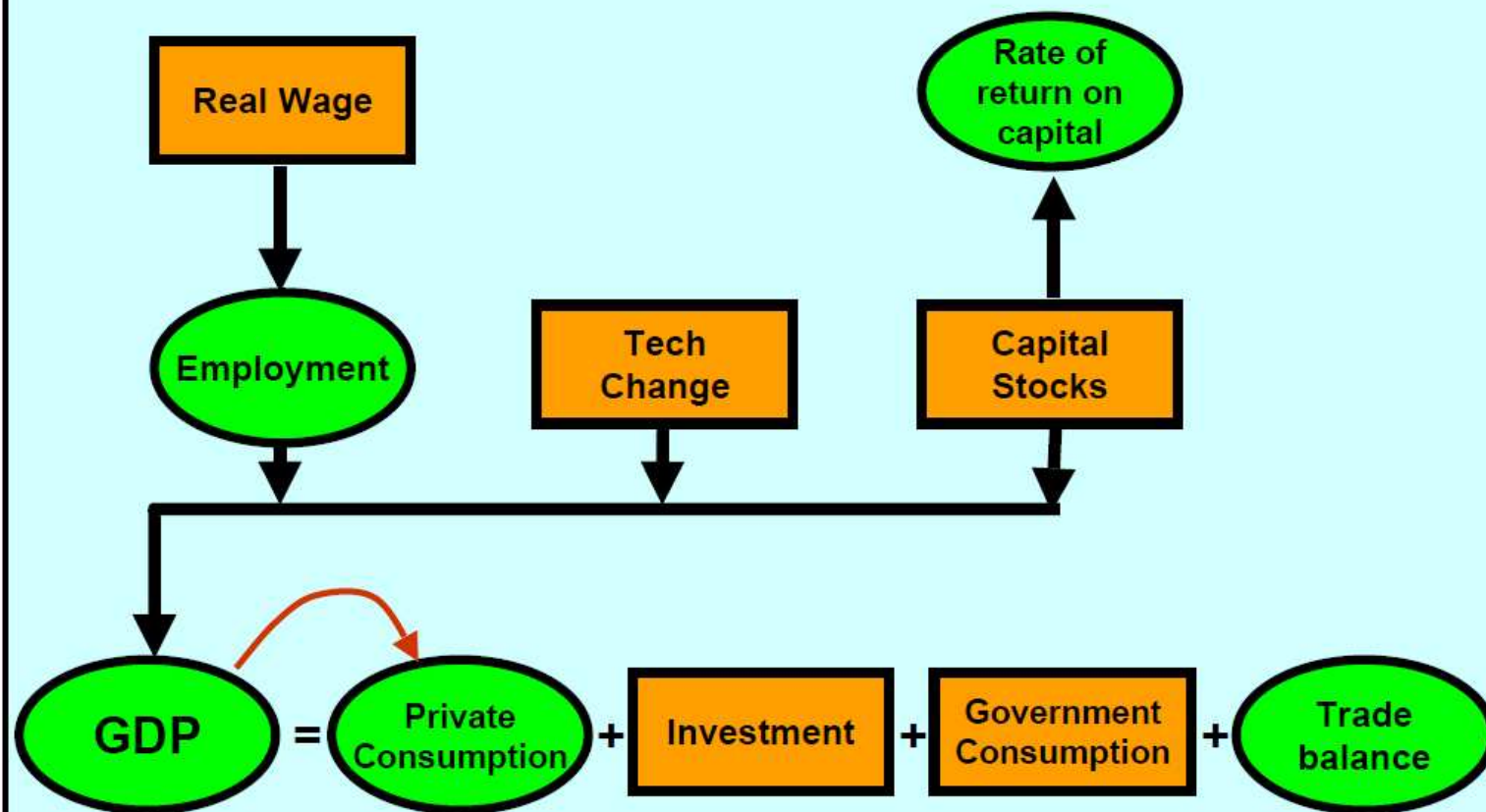
= GDPEXP(%)

Causation in Short-run Closure

Exogenous

Endogenous

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B. Sectoral Results

	Code	Sectors	production	employ- ment	factor income
1	A	AgrForFish	0.39	1.03	2.69
2	B	MineQuar	-0.13	-0.86	-0.54
3	C01-C14	Manufact	0.02	-0.47	0.35
4	D, E	EGW	0.42	0.7	1.41
5	F	Construct	0.02	-0.22	0.61
6	G	Trade	0.07	-0.22	0.69
7	H	Transport	0.13	-0.13	0.7
8	I	FoodSvcAcc	1.14	1.35	2.07
9	J	CommBroad	0.59	0.95	1.66
10	K	FinanInsur	1.08	2.1	2.75
11	L	RealEstate	0.73	4.83	4.82
12	M, N	ProfBusiness	-0.05	-0.38	0.48
13	O	PADSS	0.06	-0.22	0.65
14	P	Education	1.01	0.95	1.8
15	Q	HealSocCare	0.81	0.84	1.7
16	R, S,T	ArtSportsOth	1.54	2.15	2.87

C. Regional Effects

MainMacro	Seoul	Incheon	Kyeong gi	Daejeon	Sejong	Chungb uk	Chungn am	Kwangj u	Jeonbuk
RealHou	1.69	1.92	1.61	1.91	1.14	1.56	1.56	2.12	2.95
RealInv	0.29	0.18	-0.26	0.01	-0.21	-0.18	-0.18	0.43	0.22
RealGov	0	0	0	0	0	0	0	0	0
ExpVol	-0.78	-0.37	-0.27	-0.55	-0.27	-0.27	-0.13	-0.55	-0.66
ImpVolUsed	0.75	0.41	0.4	0.49	0.12	0.2	0.18	0.58	0.79
ImpsLanded	0.52	0.48	0.44	0.45	0.41	0.29	0.23	0.4	0.65
RealGDP	0.64	0.64	0.6	0.54	0.52	0.55	0.66	0.65	0.73
AggEmploy	0.41	0.23	0.25	0.14	0.14	0.09	0.27	0.28	0.36
realwage_io	0	0	0	0	0	0	0	0	0
plab_io	0.84	0.81	0.58	1.08	0.45	0.63	0.42	1.19	1.12
AggCapStock	0	0	0	0	0	0	0	0	0
GDPPI	0.87	0.62	0.41	0.93	0.1	0.28	0.13	1.08	1.15
CPI	0.84	0.81	0.58	1.08	0.45	0.63	0.42	1.19	1.12
ExportPI	0.38	0.15	0.1	0.2	0.1	0.1	0.05	0.19	0.24
ImpsLandedPI	0	0	0	0	0	0	0	0	0
Population	0	0	0	0	0	0	0	0	0
NomHou	2.54	2.75	2.19	3.01	1.59	2.19	1.99	3.33	4.11
NomGDP	1.52	1.27	1.01	1.47	0.62	0.83	0.79	1.75	1.89

MainMacro	Jeonnam	Daegu	Kyeongbuk	Pusan	Ulsan	Kyeongnam	Kangwon	Jeju	National
RealHou	2.34	2.65	2.06	2.75	1.09	1.89	2.62	2.49	1.9
RealInv	0.07	0.46	-0.17	0.61	-0.21	-0.05	0.16	0.28	0
RealGov	0	0	0	0	0	0	0	0	0
ExpVol	-0.24	-0.95	-0.28	-0.94	-0.11	-0.51	-0.75	-1.12	-0.35
ImpVolUsed	0.24	0.76	0.19	0.76	0.14	0.33	0.9	1.04	0.4
ImpsLanded	0.35	0.33	0.43	0.52	0.25	0.31	0.48	0.46	0.4
RealGDP	0.75	0.58	0.56	0.62	0.73	0.54	0.62	0.72	0.62
AggEmploy	0.41	0.12	0.11	0.17	0.32	0.01	0.28	0.52	0.27
realwage_io	0	0	0	0	0	0	0	0	0
plab_io	0.61	1.77	0.73	1.64	0.48	1	1.18	1.04	0.83
AggCapStock	0	0	0	0	0	0	0	0	0
GDPPI	0.39	1.85	0.38	1.69	-0.03	0.74	1.18	1.13	0.67
CPI	0.61	1.77	0.73	1.64	0.48	1	1.18	1.04	0.85
ExportPI	0.09	0.35	0.1	0.4	0.04	0.18	0.32	0.57	0.14
ImpsLandedPI	0	0	0	0	0	0	0	0	0
Population	0	0	0	0	0	0	0	0	0
NomHou	2.97	4.47	2.8	4.43	1.57	2.9	3.83	3.56	2.76
NomGDP	1.14	2.44	0.95	2.33	0.7	1.28	1.81	1.86	1.3

D. Decomposition of real GDP

	contxgdpex p	HOU	INV	GOV	STOCK S	EXP	Imports	RExports	RImports	NetMar
1	Seoul	0.8	0.09	0	0	-0.13	-0.06	0.18	-0.25	0.01
2	Incheon	0.99	0.04	0	0	-0.14	-0.19	0.29	-0.33	0
3	Kyeonggi	0.85	-0.11	0	0	-0.12	-0.05	0.18	-0.15	0
4	Daejeon	0.91	0	0	0	-0.12	-0.38	0.36	-0.24	0
5	Sejong	0.15	-0.08	0	0	-0.06	-1.58	1.99	0.1	0.01
6	Chungbuk	0.64	-0.04	0	0	-0.12	-0.21	0.37	-0.11	0.01
7	Chungnam	0.52	-0.05	0	0	-0.1	-0.09	0.38	-0.02	0
8	Kwangju	1.21	0.09	0	0	-0.19	-0.51	0.38	-0.33	0
9	Jeonbuk	1.84	0.05	0	0	-0.19	-0.33	0.03	-0.64	-0.03
10	Jeonnam	0.86	0.02	0	0	-0.15	-0.15	0.35	-0.16	-0.01
11	Daegu	1.63	0.12	0	0	-0.15	-0.25	-0.16	-0.59	-0.02
12	Kyeongbuk	0.71	-0.04	0	0	-0.16	-0.09	0.23	-0.09	0
13	Pusan	1.66	0.13	0	0	-0.26	-0.19	-0.16	-0.54	-0.02
14	Ulsan	0.32	-0.03	0	0	-0.12	-0.11	0.59	0.09	0
15	Kyeongnam	0.97	-0.01	0	0	-0.24	-0.12	0.11	-0.16	0
16	Kangwon	1.26	0.04	0	0	-0.07	-0.37	0.24	-0.47	-0.01
17	Jeju	1.15	0.09	0	0	-0.12	-0.69	0.68	-0.38	0

IV. Summary

Even though the government exercises common social policy for the whole nation, the regional effects varies according to the diversity of the industrial structure, population composition, labour market, etc.

- These regional characteristics are quite hard to change despite of the policy efforts by the government authorities.

We also included 229 municipalities as a top-down manner (see Appendix)

- Employment, value added, household consumption by municipalities can be used for the detailed analysis for income inequality and/or poverty.

Dagum, Singh-Maddala, or generalized beta (type 2) distribution can be estimated with municipal income/consumption for welfare analysis.

- Dagum and Singh-Maddala distributions have three parameters, but GB(2) has four parameters. Dagum and Singh-Maddala is a special case of GB(2).

For the future direction of research, I'm interested in

- Developing a SAM version of TERM model, so that we can explicitly handle transfer income from government to household decile
- Integration of TERM model and microsimulation model to fully investigate welfare effects of the various social policy
- adding some variables that facilitate marginal cost of public funds (MCF) in our policy analysis

In addition, we may try to construct a municipal activity index for current business cycle analysis (such as national economic activity index by Chicago Fed) – too ambitious?

Final desire/suggestions!

- Overlapping generation models are not covered much in Gempack users. I think it is also an important area of research.
- How about DSGE modelling with Gempack?

Appendix

- Available on request.

Table A1. MainMacros

Table A2. Regional production (xtot)

Table A3. Nominal wage by sector and region

Table A4. Municipal Advantage Decomposition

Appendix.

Table A1. Main Macros

	1. SEL	2. ICN	3. KKG	4. DJN	5. SJG	6. CBK	7. CBN	8. KGU	9. JNB	10. JNN	11. DGU	12. KGB	13. PSN	14. ULS	15. KNM	16. KWN	17. JJU
RealHou	1.69	1.92	1.61	1.91	1.14	1.56	1.56	2.12	2.95	2.34	2.66	2.06	2.75	1.09	1.89	2.62	2.49
RealInv	0.29	0.18	-0.26	0.01	-0.21	-0.18	-0.18	0.43	0.22	0.07	0.46	-0.17	0.61	-0.21	-0.05	0.16	0.28
RealGov	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ExpVol	-0.78	-0.37	-0.27	-0.55	-0.27	-0.27	-0.13	-0.55	-0.66	-0.24	-0.95	-0.28	-0.95	-0.11	-0.51	-0.75	-1.12
ImpVolUsed	0.75	0.41	0.40	0.49	0.12	0.20	0.18	0.58	0.79	0.24	0.76	0.19	0.76	0.14	0.33	0.90	1.04
ImpsLanded	0.52	0.48	0.44	0.45	0.41	0.29	0.23	0.40	0.65	0.36	0.33	0.43	0.52	0.25	0.31	0.48	0.46
RealGDP	0.64	0.65	0.60	0.54	0.52	0.55	0.66	0.66	0.73	0.75	0.58	0.57	0.62	0.73	0.54	0.62	0.72
AggEmploy	0.41	0.23	0.25	0.14	0.15	0.09	0.27	0.28	0.36	0.41	0.12	0.11	0.17	0.32	0.02	0.28	0.52
realwage_io	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
plab_io	0.84	0.81	0.58	1.08	0.45	0.63	0.42	1.19	1.12	0.62	1.77	0.73	1.64	0.48	1.00	1.18	1.04
AggCapStock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GDPPI	0.87	0.62	0.41	0.93	0.10	0.28	0.13	1.09	1.15	0.39	1.85	0.38	1.70	-0.03	0.74	1.18	1.13
CPI	0.84	0.81	0.58	1.08	0.45	0.63	0.42	1.19	1.12	0.62	1.77	0.73	1.64	0.48	1.00	1.18	1.04
ExportPI	0.38	0.15	0.10	0.21	0.10	0.10	0.05	0.19	0.24	0.09	0.35	0.11	0.40	0.04	0.18	0.32	0.57
ImpsLandedPI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Population	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NomHou	2.54	2.75	2.19	3.01	1.59	2.19	1.99	3.33	4.11	2.97	4.47	2.80	4.43	1.58	2.90	3.83	3.56
NomGDP	1.52	1.27	1.01	1.47	0.62	0.83	0.79	1.75	1.89	1.14	2.44	0.95	2.33	0.70	1.28	1.81	1.86

Note: 1. SEL=Seoul, 2. ICN=Incheon, 3. KKG=Kyeonggi, 4. DJN=Daejeon, 5. SJG=Sejong, 6. CBK=Chungbuk, 7. CBN=Chungnam, 8. KGU=Kwangju, 9. JNB=Jeonbuk, 10. JNN=Jeonnam, 11. DGU=Daegu, 12. KGB=Kyeongbuk, 13. PSN=Pusan, 14. ULS=Ulsan, 15. KNM=Kyeongnam, 16. KWN=Kwangwon, 17. JJU=Jeju

Table A2. Regional production (xtot)

	munavextot	1. SEL	2. ICN	3. KKG	4. DJN	5. SJG	6. CBK	7. CBN	8. KGU	9. JNB	10. JNN	11. DGU	12. KGB	13. PSN	14. ULS	15. KNM	16. KWN	17. JJU
1	A__AgrForFis	0.38	0.38	0.41	0.34	0.41	0.39	0.42	0.34	0.35	0.41	0.26	0.4	0.3	0.43	0.37	0.33	0.37
2	B__MineQuar	-0.1	-0.08	0.01	-0.2	0.03	-0.04	0.06	-0.23	-0.25	0	-0.47	-0.06	-0.44	0.02	-0.19	-0.26	-0.25
3	C__Manufact	-0.04	0.02	0.12	-0.29	0.14	0.03	0.21	-0.29	-0.29	0.21	-0.78	0.04	-0.67	0.28	-0.22	-0.4	-0.42
4	DE_EGW	0.39	0.45	0.46	0.26	0.36	0.31	0.42	0.33	0.53	0.44	0.31	0.35	0.65	0.33	0.35	0.39	0.43
5	F__Construct	0.1	0.1	-0.05	-0.09	0.05	-0.03	0	0.16	0.03	0.13	0.05	-0.06	0.16	0.03	-0.01	-0.02	0.07
6	G__Trade	0.11	0.1	0.12	-0.07	0.14	0.05	0.16	-0.05	0.05	0.19	-0.22	0.04	-0.12	0.15	-0.06	0.06	0.21
7	H__Transport	0.21	0.11	0.28	0.28	0.21	0.17	0.2	0.2	0.11	0.11	0.09	0.17	-0.2	0.14	0.01	0.16	0.23
8	I__FoodSvcAc	0.9	1.12	1.13	1.21	0.98	1.21	1.05	1.37	1.86	1.24	1.53	1.29	1.45	0.98	1.26	1.27	0.79
9	J__CommBrod	0.5	0.65	0.63	0.58	0.79	0.77	0.78	0.77	0.97	0.98	0.55	0.8	0.56	0.82	0.76	0.87	1.02
10	K__FinanIns	0.99	0.99	1.01	1.11	0.94	1.04	1.01	1.23	1.46	1.25	1.31	1.12	1.38	1.12	1.2	1.23	1.35
11	L__RealEstat	0.65	0.79	0.62	0.73	0.37	0.63	0.57	0.86	1.15	0.77	1.07	0.73	1.1	0.47	0.78	0.94	0.77
12	MN_ProfBusi	-0.05	-0.01	0	-0.13	0.15	0.03	0.14	-0.11	-0.15	0.11	-0.35	-0.09	-0.27	0.11	-0.15	-0.16	-0.02
13	O__PADSS	0.04	0.05	0.11	0.01	0.16	0.1	0.14	0	0.01	0.1	-0.1	0.11	-0.06	0.22	0.07	0	0.03
14	P__Education	1.04	1.03	1.01	0.83	1.28	0.9	0.85	0.91	1.13	1.03	0.99	1.05	1.08	0.95	1.03	0.9	1
15	Q__HealSocCa	0.63	0.85	0.82	0.72	1	0.83	0.86	0.76	1.12	1.09	0.82	1.03	0.84	0.81	0.9	0.96	0.96
16	RST_ArtSpOth	1.37	1.48	1.48	1.58	1.38	1.43	1.35	1.76	2.15	1.62	2	1.62	1.89	1.32	1.61	1.72	1.63

Note: 1. SEL=Seoul, 2. ICN=Incheon, 3. KKG=Kyeonggi, 4. DJN=Daejeon, 5. SJG=Sejong, 6. CBK=Chungbuk, 7. CBN=Chungnam, 8. KGU=Kwangju, 9. JNB=Jeonbuk, 10. JNN=Jeonnam, 11. DGU=Daegu, 12. KGB=Kyeongbuk, 13. PSN=Pusan, 14. ULS=Ulsan, 15. KNM=Kyeongnam, 16. KWN=Kwangwon, 17. JJU=Jeju

Table A3. Nominal wage by sector and region

	wllab	1. SEL	2. ICN	3. KKG	4. DJN	5. SJG	6. CBK	7. CBN	8. KGU	9. JNB	10. JNN	11. DGU	12. KGB	13. PSN	14. ULS	15. KNM	16. KWN	17. JJU
1	A__AgrForFis	1.82	1.83	1.76	1.85	1.61	1.66	1.66	1.95	1.96	1.8	2.07	1.83	2.18	1.78	1.94	1.91	1.99
2	B__MineQuar	0.04	0.07	0.06	0	-0.01	0	0.05	0.03	-0.08	0.09	-0.02	0.03	-0.07	0.01	-0.04	-0.04	-0.17
3	C__Manufact	0.31	0.38	0.36	-0.14	0.28	0.15	0.46	0.08	0.03	0.63	-0.44	0.23	-0.34	0.7	0.09	-0.15	-0.27
4	DE_EGW	1.38	1.67	1.35	1.26	1	0.9	1.22	1.52	2.1	1.48	2.07	1.21	3.11	0.91	1.46	1.71	1.72
5	F__Construct	0.72	0.68	0.27	0.72	0.27	0.34	0.18	1.14	0.91	0.53	1.58	0.41	1.59	0.27	0.75	0.91	0.88
6	G__Trade	0.68	0.62	0.44	0.6	0.33	0.35	0.34	0.74	0.85	0.6	1.01	0.45	1.07	0.4	0.53	0.94	1.06
7	H__Transport	0.85	0.65	0.71	1.22	0.47	0.58	0.43	1.19	0.96	0.45	1.57	0.67	0.91	0.37	0.65	1.12	1.09
8	I__FoodSvcAc	1.85	2.14	1.92	2.54	1.58	2.08	1.65	2.89	3.53	2.11	3.72	2.3	3.46	1.61	2.54	2.74	1.89
9	J__CommBrod	1.58	1.92	1.64	2.02	1.92	2.05	1.86	2.62	3.04	2.54	2.64	2.22	2.55	2.01	2.39	2.86	3.08
10	K__FinanIns	2.75	2.72	2.52	3.27	2.22	2.65	2.38	3.69	4.19	3.16	4.48	2.94	4.52	2.71	3.41	3.68	3.83
11	L__RealEstat	5	6.3	4.4	5.95	1.98	4.59	3.85	7.36	10.07	5.84	9.99	5.65	10.08	2.92	6.38	8.1	6.32
12	MN_ProfBusi	0.46	0.48	0.28	0.58	0.37	0.36	0.33	0.7	0.58	0.47	0.91	0.29	0.9	0.34	0.45	0.62	0.68
13	O__PADSS	0.58	0.57	0.43	0.77	0.39	0.46	0.33	0.87	0.81	0.45	1.29	0.58	1.23	0.52	0.79	0.86	0.77
14	P__Education	1.84	1.79	1.54	1.83	1.73	1.46	1.2	2.04	2.23	1.6	2.72	1.74	2.7	1.37	1.98	2.02	1.99
15	Q__HealSocCa	1.43	1.71	1.43	1.8	1.55	1.49	1.33	1.96	2.39	1.84	2.63	1.87	2.53	1.32	1.97	2.24	2.09
16	RST_ArtSpOth	2.76	2.85	2.66	3.25	2.41	2.54	2.26	3.64	4.18	2.89	4.53	2.99	4.36	2.23	3.22	3.85	3.59

Table A4. Municipal Advantage Decomposition

No.	munadvdecomp	A	B	C	DE	F	G	H	I	J	K	L	MN	O	P	Q	RST
1	JongRoSW	0	0	0.01	0	0	0.01	0	0.02	0.02	0	0	0.01	0	0.01	0.01	0.03
2	JoongGuSW	0	0	0.01	0	0	-0.01	0	0.01	0	-0.01	0	0	0	-0.01	0	0
3	YongSanSW	0	0	0.01	0	0	0	0	0.01	0.01	-0.01	0.01	-0.01	0	0	0	0.01
4	SeongDongSW	0	0	0	0	0	0.01	0	-0.01	0	0.04	0	0	0	0.01	0.01	-0.01
5	GwangJinSW	0	0	-0.01	0	0	0	0	-0.01	-0.01	0.02	0	0.01	0	0	0	-0.01
6	DongDaeMuSW	0	0	0	0	0	-0.01	0	-0.01	-0.01	0	0	0	0	-0.01	-0.01	-0.01
7	JoongRangSW	0	0	0	0	0	-0.01	0	-0.01	-0.01	0	0	0	0	-0.02	-0.01	-0.01
8	SeongBookSW	0	0	0	0	-0.02	0.01	0	-0.01	0	-0.04	0	0.01	-0.01	0.01	0	0
9	GangBookSW	0	0	0.01	0	0	0.01	0	0.02	0.01	0.01	0	0	0	0	0.01	0.07
10	DohBongSW	0	0	0.01	0	0	0.01	0	0.02	0.01	-0.01	0	0.01	0	0.02	0.01	0.02
11	NohWonSW	0	0	-0.02	0	-0.01	0	0	-0.01	-0.01	-0.04	-0.01	0.01	0	-0.01	-0.01	-0.01
12	EunPyeongSW	0	0	0	0	0	0	0	-0.01	0	0	0.02	-0.01	0	-0.01	-0.01	0
13	SeoDaeMunSW	0	0	0.01	0	0	0.01	0	0.04	0.01	-0.01	0.01	0	0	0.01	0.01	0.02
14	MahPoSW	0	0	0.01	0	0	0.01	0	0	0.01	0.05	0	0	-0.01	0.03	0.01	0.02
15	YahngCheonSW	0	0	0.01	0	0	0.01	0	0.01	0.01	0.03	0	0.01	0	0.02	0.02	0.03
16	GahngSeoSW	0	0	0	0	0	0	0	0.01	0	-0.01	0.01	-0.01	0.01	-0.01	-0.01	-0.01
17	GooRoSW	0	0	-0.01	0	0	-0.01	0	-0.01	-0.01	-0.04	-0.02	0.01	0	0.01	0	0
18	GeumCheonSW	0	0	-0.04	0	0	0	0	-0.01	0	-0.03	-0.01	0.01	0	0.01	-0.01	-0.02
19	YeongDeuPoSW	0	0	0.01	0	0	0	0	0	0	0.02	0	0	0	0	0	0
20	DongJakSW	0	0	0	0	0	0.01	0	-0.01	0	0.02	-0.02	0.01	-0.01	0.01	0.01	-0.01
21	GwanAkSW	0	0	0	0	0	0.01	0	0	0	0.04	0.01	0.01	0	0.01	0.01	0.01
22	SeoChoSW	0	0	0.01	0	0	0.01	0	0.02	0.01	0	0.01	-0.01	0	0	0.01	0.04
23	GangNamSW	0	0	0.01	0	0	0.01	0	0.01	0.01	0.03	0	0	0	0.01	0.01	0.05
24	SongPaSW	0	0	0.01	0	-0.01	0.01	0	-0.01	0.01	0.02	-0.01	0.01	0	-0.01	0.01	0
25	GangDongSW	0	0	0.01	0	-0.01	0.01	0	-0.01	0.02	0.04	-0.02	0.01	0	0	0.02	0.02
26	JoongGuIC	0	0	0.02	0.02	0	0	0	0.01	0.01	0.01	-0.02	0	0	0	0.02	0.01
27	DongGuIC	0	0	-0.01	-0.02	0	0	0	-0.01	0	-0.01	0	0	0	-0.02	-0.02	-0.01
28	MiChuHolIC	0	0	0.02	0.03	0	0	0	0.01	0.01	0.03	-0.01	0	0	0.04	0.04	0.02
29	YeonSoolIC	0	0	0.02	0.02	0	0	0	0.06	0.01	0	0	0	0	0.01	0.02	0.02
30	NamDongIC	0	0	0.01	0.02	0	0	0	0	0	-0.01	-0.04	0	0	-0.02	0	0.01
31	BooPyeongIC	0	0	0.01	0.01	0	0	0	-0.01	0	0	-0.03	0	0	-0.02	0.01	0.01
32	KyeYangIC	0	0	0.01	0	0	0	0	0	0	0.02	0.01	0	0	0.01	0.01	0

33	SeoGuIC	0	0	-0.01	-0.01	0	0	0	-0.01	0	-0.01	0.01	0	0	-0.01	-0.01	-0.01
34	GangHwaIC	0	0	0.01	0.06	0	0	0	0	0	0	-0.01	0	0	0.05	0.02	0
35	OngJinIC	0	0	0.02	0.02	0	0	0	0.02	0	0.02	-0.01	0	0	0.03	0.03	0.04
36	SooWonGG	0	0	0	0	0.01	0	0.01	0.09	0.03	0.02	0.06	0	0	0.04	0.03	0.09
37	SeongNamGG	0	0	0	0	0.01	0	0	0.02	0.03	0.05	0.04	0	0	0.03	0.04	0.02
38	EuiJeongBuGG	0	0	0	0	0.01	0	0	0.08	0.08	0.02	0.02	0	0	0.02	0.07	0.09
39	AhnYahngGG	0	0	0	-0.01	0.01	0.01	0	0.08	0.02	0.02	0.07	0	0	0.05	0.04	0.03
40	BooCheonGG	0	0	0	0	0.01	0	0	0.02	0.02	0.09	0.1	0	0	0.06	0.03	0.08
41	GwangMyongGG	0	0	0	0	0.01	0	0	0.02	0.02	0.07	0.09	-0.01	0	0.05	0.02	0.06
42	PyeongTaekGG	0	0	0	0.01	0.01	0	0	0.06	0.04	0	0.05	0	0	0	0.07	0.08
43	DongDuChonGG	0	0	0	0	0.01	0	0.01	0.06	0.06	0.02	0.04	0	0	0.02	0.11	0.11
44	AhnSanGG	0	0	0	0	0.01	0	0	0.02	0.03	0.05	0.05	0	0	0.06	0.04	0.02
45	GoYangGG	0	0	0	0	0.01	0	0	0.08	0.06	0.02	0.02	0	0	0.08	0.07	0.09
46	GwaCheonGG	0	0	0	0	0.01	0	0	0.03	0.04	0.02	0.01	0	0	0.03	0.05	0.04
47	GooRiGG	0	0	0	0	0	0	0	-0.02	-0.01	-0.02	-0.02	0.01	0	-0.02	-0.02	-0.02
48	NamYangJuGG	0	0	0	0	0.01	0	0	0.11	0.05	0.01	0.03	0	0	0.01	0.05	0.05
49	OhSanGG	0	0	0	0	0.01	0	0	0	0	-0.01	0.01	0	0	0.01	0	-0.01
50	SiHeungGG	0	0	0	0	-0.02	0	0	-0.01	-0.02	-0.02	-0.03	0	0	-0.03	-0.02	-0.03
51	GoonPoGG	0.01	0	0	0	0.01	0	0	-0.02	-0.02	-0.03	-0.04	0.01	0	-0.03	-0.02	-0.03
52	EuiWahngGG	0.05	0	0	0.02	-0.01	0	0	-0.02	0	-0.03	-0.04	0.01	0	-0.02	-0.02	-0.02
53	HaNamGG	0	0	0	0.03	0.01	0	0	-0.02	-0.02	-0.03	-0.03	0.01	0	-0.03	-0.02	-0.03
54	YongInGG	0	0	0	0	-0.01	0	0	-0.01	-0.01	-0.01	-0.02	0	0	-0.01	-0.01	-0.02
55	PaJooGG	0	0	0	-0.01	0	0	0	-0.02	-0.02	-0.02	-0.03	0	0	-0.03	-0.02	-0.02
56	EhCheonGG	0.04	0	0	0	0.01	0	0	-0.02	-0.02	-0.03	-0.04	0.01	0	-0.03	-0.02	-0.03
57	AhnSeongGG	0.01	0	0	0	0.01	0	0	-0.02	-0.02	-0.03	-0.04	0.01	0	-0.04	-0.03	-0.03
58	GimPoGG	0.01	0	0	-0.01	-0.02	0	0	-0.02	-0.02	-0.03	-0.04	0.01	0	-0.03	-0.02	-0.03
59	HwaSeongGG	0	0	0	0.01	0	0	0	0	0	0	-0.01	-0.01	0	0	0.03	0.01
60	GwangJuGG	0	0	0	0	0	0	0	-0.01	-0.01	-0.01	-0.02	-0.01	0	-0.01	-0.01	-0.01
61	YangJuGG	0	0	0	0.02	0.01	0	0	-0.02	-0.02	-0.02	-0.03	0	0	-0.02	-0.02	-0.02
62	PoCheonGG	0.01	0	0	0	0	0	0	-0.02	-0.02	-0.03	-0.04	0.01	0	-0.04	-0.02	-0.03
63	YeoJooGG	0.01	0	0	-0.01	-0.04	0	0	-0.02	-0.02	-0.02	-0.04	0.01	0	-0.03	-0.02	-0.03
64	YeonChonGG	0.01	0	0	0	0	0	0	-0.01	0	-0.01	-0.01	-0.01	0	0.03	0	-0.01
65	GaPyeongGG	0	0	0	0	0	0	0	0	-0.01	0	0.01	-0.03	0	0.02	0	0
66	YangPyoengGG	0.01	0	0	0	0.01	0	0.01	-0.01	0.03	-0.01	0	0	0	0.02	0.01	-0.01
67	DongGuDJ	0	0	0.02	0.01	0.01	0	0	-0.01	0.02	0	0.01	0.01	0	0.05	0.03	0
68	JoongGuDJ	0	0	0	0	0	0	0	-0.01	0	-0.02	0.06	0.01	0	0.01	0	0

69	SeoGuDJ	0	0	0.06	0	-0.01	0.01	0	0.02	0	0.03	0.01	-0.02	0	0.01	0.01	0.02
70	YooSeongDJ	0	0	-0.14	0	0.01	0	0	-0.02	-0.01	-0.04	-0.05	0.02	0	-0.03	-0.02	-0.03
71	DaeDeokDJ	0	0	-0.08	0	0.01	-0.03	0	-0.01	-0.01	-0.04	-0.04	0.03	0	-0.03	-0.02	-0.03
72	SeJongSJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	ChoongJuCB	0	0	0	0	0	0	0	0.02	0	0.02	0.01	0	0	0	0.01	0
74	JeCheonCB	0.01	0	0	0	0	0	0	-0.01	-0.01	0	-0.02	0	0	-0.03	-0.02	-0.01
75	CheongJuCB	0	0	0	0	0	0	0	-0.01	0	-0.02	-0.01	0	0	-0.03	-0.01	0
76	BoEunCB	0.01	0	0	0	0	0	0	-0.01	-0.01	0	-0.02	0	0	-0.03	-0.02	-0.01
77	OkCheonCB	-0.01	0	0	0	-0.01	0	0	0.04	0	0.01	0.02	0	0	0.05	0.02	0.02
78	YeongDongCB	0	0	0	0	0	0	0	-0.02	-0.01	-0.01	-0.02	0	0	-0.01	-0.02	-0.01
79	JinCheonCB	0.04	0	0	0.01	0	0	0	0	0.02	-0.01	0	0	0	0.02	0.01	0
80	GoeSanCB	-0.01	0	0	0	0	0	0	0	0	0.02	0.03	0	0	0.03	0.02	0.01
81	EumSeongCB	-0.01	0	0	0	0	0	0	-0.01	0	0	0	0	0	0	-0.01	-0.01
82	DanYahngCB	0.03	0	0	0.01	0	0	0	-0.01	0.01	-0.02	0.02	0	0	-0.02	-0.01	0
83	JeungPyongCB	-0.01	0	0	0	0	0	0	-0.01	0.02	-0.02	0.01	0	0.01	-0.01	0.01	0.02
84	CheonAhnCN	0.01	0	-0.03	0	0.01	0	0	0.01	0	0.01	0.02	0	0	0.01	0.01	0.01
85	GongJooCN	-0.01	0	-0.04	0	0.01	0	0	0.01	0.01	0.01	0.02	0	0	0.06	0.03	0.02
86	BoRyeongCN	0.01	0	-0.02	0.01	0	0	0	0	0.01	0.04	0.02	0	0	0.04	0.01	0.01
87	AhSanCN	0	0	-0.02	0.01	0.01	0	0	0.06	0.01	0.02	0.03	0	0	0.02	0.01	0.02
88	SeoSanCN	-0.01	0	0.01	0.03	0.01	0	0	-0.01	0	-0.02	-0.01	0	0	-0.01	-0.01	0
89	NonSanCN	0	0	0	0	0.01	0	0	0	0	0.02	0.01	0	0	0.01	0.01	0.01
90	KyeRyongCN	0.02	0	-0.01	0.01	0.01	0	0	0	0.02	-0.01	0.02	0	0	0.01	0.02	0.02
91	DangJinCN	0	0	0	0.02	0.01	0	0	-0.02	0.01	0	-0.01	0	0	0	0	0
92	KeumSanCN	-0.01	0	-0.05	-0.01	0.01	0	0	-0.02	-0.01	-0.02	-0.02	0	0.01	0.08	0.16	0.48
93	BuYeoCN	-0.01	0	0.02	-0.01	0	0	0	-0.01	0	-0.01	-0.01	0	0	-0.01	0	0
94	SeoCheonCN	0.01	0	0.02	-0.01	0	0	0	-0.01	-0.01	-0.02	-0.02	0	0	-0.02	-0.02	-0.01
95	CheongYangCN	0.03	0	0.01	-0.01	-0.01	0	0	-0.02	-0.01	0.01	-0.02	0	0	-0.02	-0.02	-0.01
96	HongSeongCN	0.01	0	0.02	-0.01	0	0	0	-0.01	0	-0.02	-0.02	0	0	-0.02	-0.02	-0.01
97	YeahSanCN	0	0	0.01	-0.01	0.01	0	0	-0.02	0	0	0	0	0	-0.01	0	0
98	TaeAhnCN	0	0	0.02	-0.01	-0.01	0	0	-0.01	-0.01	-0.01	-0.02	0	0	-0.03	-0.02	-0.01
99	DongGuGJ	0	0	0.08	0.01	0	-0.01	0	-0.04	0	-0.06	0.01	0	0	-0.02	-0.01	-0.01
100	SeoGuGJ	0	0	0.06	0	0	-0.02	0	-0.03	0	0	-0.05	0	-0.01	0.02	0	-0.02
101	NamGuGJ	0	0	0.1	0	0	-0.02	0	-0.03	0	-0.01	0.02	0	0	0.02	0.02	-0.01
102	BukGuGJ	0	0	0.08	0	0	0	0	0.01	0.03	-0.05	0.18	-0.01	0	0.06	0.03	0.04
103	GwangSanGJ	0	0	-0.08	0	0	0.02	0	0.02	0	0.02	-0.02	0	0	-0.01	-0.01	0
104	JeonJooJB	0	0	-0.11	-0.01	0	0.01	0	0.06	-0.01	-0.01	-0.05	0.01	0.01	-0.03	-0.03	-0.01

105	GoonSanJB	0	0	0.08	0.02	-0.07	0.01	0	-0.05	-0.01	-0.05	0.03	0.01	0.02	-0.05	-0.05	-0.04
106	IkSanJB	-0.01	0	0.03	0	0.01	0	0	-0.03	0.01	-0.02	0.05	-0.01	0	0.03	0.03	0.02
107	JeongEupJB	0.01	0	0.02	0	0.01	0	0	-0.01	0	0.06	0.03	0	0	0	-0.01	0.06
108	NamWonJB	0.02	0	0	0	0.01	0	0	-0.03	0	0.03	-0.04	0	0	0.01	0.01	0.03
109	GimJeJB	0.04	0	0.03	0.01	0.01	0	0	-0.01	-0.01	-0.05	-0.02	0	0.01	-0.02	-0.02	-0.02
110	WanJooJB	-0.01	0	0.09	-0.01	0.01	-0.01	0	-0.01	0.01	0.02	0.05	-0.01	-0.01	0.03	0.04	0.02
111	JinAhnJB	0	0	0.06	0.02	-0.02	-0.01	0	-0.05	0	0	0.01	0.01	0.01	-0.01	0	-0.03
112	MooJooJB	0.01	0	0.01	0.01	0	0.01	0	0	0.02	-0.01	-0.01	0	0.01	0.07	0.02	-0.01
113	JahngSooJB	0.03	0	-0.01	0.04	0.01	0.01	0	-0.05	0.02	-0.06	-0.04	0	0	-0.02	-0.03	-0.02
114	ImSilJB	0.02	0	-0.08	-0.01	0.01	0	0	-0.02	-0.01	0.02	-0.05	0.01	0	-0.03	-0.03	-0.03
115	SoonChangJB	0.01	0	0.04	0	-0.03	0	0	-0.05	-0.01	-0.05	-0.06	0.01	-0.01	-0.02	-0.03	-0.02
116	GoChangJB	0	0	-0.18	0	0.01	0.01	0	0.01	-0.01	-0.06	-0.06	0.01	0	-0.05	-0.04	-0.04
117	BuAhnJB	0.02	0	0	-0.01	0.01	-0.02	0	-0.05	0	-0.04	-0.06	0.01	-0.01	0	-0.01	-0.03
118	MokPoJN	0	0	0	-0.01	-0.03	0	0	-0.01	-0.01	0.01	-0.01	0	0	-0.02	-0.02	-0.01
119	YeoSooJN	0.04	0	0	0	0	0	0	-0.02	-0.01	0	-0.02	0	0	0.01	-0.01	0
120	SoonCheonJN	0.02	0	0	0.07	0	0	0	-0.01	0.01	-0.01	0	0	0	-0.01	0.01	0
121	NaJooJN	0.03	0	0	0.01	0	0	0	0	0	0	-0.01	0	0	0	0	0
122	GwangYahngJN	-0.01	0	0	0	0	0	0	0.01	0.02	0.02	0.03	0	-0.01	0.04	0.05	0.03
123	DamYahngJN	0.02	0	0	-0.01	0	0	0	-0.02	0.01	0	0	0	0	0.03	0.02	0.02
124	GokSeongJN	0.04	0	0	0.02	0	0	0	-0.01	0	0.03	-0.02	0	0	0.01	0.01	0
125	GooRyeJN	-0.01	0	0	0	-0.01	0	0	-0.01	-0.01	-0.01	-0.01	0	0	-0.01	-0.01	-0.01
126	GoHeungJN	0	0	0.01	-0.01	0	0	0	0	-0.01	-0.02	-0.02	0	0.01	-0.02	-0.02	-0.01
127	BoSeungJN	0	0	0.01	-0.01	0	0	0	-0.01	-0.01	-0.03	-0.02	0	0.01	-0.03	-0.03	-0.02
128	HwaSoonJN	0	0	0.01	-0.01	0	0	0	0	-0.01	-0.03	-0.02	0	0.01	-0.03	-0.03	-0.02
129	JangHeungJN	0.03	0	0	-0.01	0	0	0	-0.01	0	-0.02	-0.02	0	-0.01	0.01	0.01	0.01
130	GangJinJN	-0.01	0	0	0.01	0	0	-0.01	-0.01	0.01	0.03	0.03	0	-0.01	0.01	0.01	0
131	HaeNamJN	0.04	0	0	0	0	0	0	0	-0.01	-0.02	-0.01	0	0.01	0.01	0.02	0.02
132	YeongAhmJN	-0.01	0	0	0	0	0	-0.01	0	0.01	-0.02	0	-0.01	0	0.01	0	0.01
133	MooAhnJN	0.01	0	0	-0.01	0	0	0	-0.02	0.01	-0.02	0.06	0	0	0	-0.02	-0.01
134	HamPyeongJN	0	0	0	-0.01	0	0	0	-0.02	-0.01	0.01	-0.01	0	0	0.01	-0.01	-0.01
135	YeongGwangJN	-0.01	0	0	-0.01	0	0	0	0.01	-0.01	-0.02	-0.02	0	-0.01	0.03	-0.02	0
136	JangSeongJN	0.01	0	0	-0.01	0	0	0	-0.01	0.01	0.03	0	0	0	0	-0.01	0
137	WanDoJN	0	0	0	-0.01	0	0	0	0.07	0	-0.01	0	0	0	0	0.01	0
138	JinDoJN	0	0	0	-0.01	0	0	0	-0.02	0	-0.01	0.01	0	0	0	-0.01	0
139	SinAhnJN	0	0	0	0.02	0	0	0	-0.01	0	0	-0.01	0	0	0	-0.02	0
140	JoongGuDG	0	0	-0.04	0	0	-0.1	0	-0.04	-0.01	-0.04	-0.08	0.02	0.01	-0.04	-0.02	-0.05

141	DongGuDG	0	0	0.14	0	0	0.02	0	-0.03	0	0	-0.04	0.01	-0.02	0	0	0.03
142	SeoGuDG	0	0	-0.31	-0.01	0	0.03	0	-0.04	-0.01	-0.06	-0.1	0.02	0	-0.04	-0.03	-0.04
143	NamGuDG	0	0	0.05	0.05	0	0.03	0	-0.05	0.08	0.33	-0.03	0.02	0.01	0.01	-0.01	0.01
144	BukGuDG	0	0	0.01	0	0	0.01	0	0	0	0.01	-0.03	-0.03	0	0.02	0.01	-0.01
145	SooSeongDG	0	0	-0.02	0	0	0.01	0	0.2	0	-0.04	-0.03	0.01	0.01	0.03	0.05	0.1
146	DalSeoDG	0	0	0	0	0	0.02	0	-0.05	-0.01	-0.08	0.63	0.03	0.01	-0.02	-0.03	-0.04
147	DalSeongDG	0	0	-0.38	-0.01	0	0.03	0	-0.04	-0.01	-0.09	-0.1	0.01	0	-0.05	-0.04	-0.04
148	PoHahngGB	0.01	0	0	0.06	0.01	0	0.01	0	0.01	0	0.03	0	0	0.04	0.03	0.01
149	GyeongJooGB	0.03	0	0	0.06	0.01	0	0	-0.01	0.05	-0.02	-0.03	0	0	-0.02	-0.01	0
150	GimCheonGB	0.05	0	0	-0.01	0	0	0	-0.01	-0.01	0	-0.03	0.01	0	-0.01	-0.02	-0.01
151	AhnDongGB	0	0	0	-0.01	0	0	0	-0.01	0	-0.02	0	0	0.02	0	0.01	0
152	GuMiGB	0.06	0	0	-0.01	0.01	0	0	0.02	0	0.08	-0.03	0	0	0	0	0
153	YeongJooGB	-0.01	0	0	0.04	0	0	0	0.02	0.02	0.04	0.05	-0.01	0	0.09	0.05	0.01
154	YeongCheonGB	-0.01	0	0	-0.01	-0.02	0	0	0.15	0.01	0	0.04	-0.01	0	0.01	0.03	0.05
155	SangJooGB	0.06	0	0	0	0.01	0	0	-0.02	0	-0.03	-0.03	0	0	0	0	0.01
156	MoonKyeongGB	0.02	0	0	-0.01	0	0	0	-0.02	-0.01	-0.02	-0.02	0	0	-0.03	-0.01	0
157	KyongSanGB	0.01	0	0	-0.01	-0.01	0	0	0.02	0	0.01	0.03	0	0	-0.01	-0.01	0.01
158	GoonWeeGB	-0.01	0	0	-0.01	-0.01	0	0	0	0.03	0.05	0.06	-0.01	0	0.08	0.04	0.03
159	EuiSeongGB	0.02	0	0	0	0.01	0	0	0	0	0.02	0.03	0	0.01	0.05	0.07	0.03
160	CheongSongGB	0.03	0	0	0	0	0	0	0.01	0	0.01	-0.01	0	0	0.01	0	0
161	YeongYangGB	-0.01	0	0	-0.01	-0.02	0	0	-0.01	0.01	0	0.03	0	0	0.05	0.01	0.01
162	YeongDeokGB	0.14	0	0	-0.01	0.01	0	0	-0.02	0.09	-0.02	-0.03	0.01	0	0.25	0.29	0.1
163	CheongDoGB	0.01	0	0	-0.01	0	0	0	-0.02	0	0	0.02	0	0.01	0.02	0	0
164	GoRyeongGB	0	0	0	-0.01	-0.01	0	0	-0.02	-0.01	0.01	-0.01	0	0	-0.02	-0.01	-0.01
165	SeungJuGB	-0.01	0	0	-0.01	0.01	0	0	-0.02	-0.01	-0.02	-0.03	0.01	0	-0.04	-0.03	-0.02
166	ChilGokGB	0.02	0	0	-0.01	-0.01	0	0	0	-0.01	-0.01	-0.02	0	0	-0.03	-0.01	0
167	YeahCheonGB	0.01	0	0	-0.01	0	0	0	0	0	0.01	-0.03	0	0	-0.01	0	0.04
168	BongHwaGB	-0.01	0	0	-0.01	0.01	0	0	-0.02	-0.01	-0.02	-0.02	0	0	-0.03	-0.02	-0.02
169	WoolJinGB	0.01	0	0	-0.01	0	0	0	-0.02	-0.01	-0.02	-0.02	0	0	-0.02	-0.02	-0.01
170	WoolLeungGB	0	0	0	-0.01	0.01	0	0	-0.02	-0.01	0	-0.03	0	0	-0.03	-0.02	-0.02
171	JoongGuPS	0	0	0.04	-0.01	0	-0.03	0.01	-0.01	-0.01	-0.04	0.01	0.01	0	0.01	0	0.16
172	SeoGuPS	0	0	-0.06	-0.01	0	-0.03	-0.02	-0.04	-0.01	-0.07	-0.09	0.01	-0.01	-0.04	-0.03	-0.04
173	DongGuPS	0.01	0	-0.08	-0.01	0	0.01	0.01	-0.03	0	-0.04	-0.09	-0.01	-0.01	0	-0.01	0.04
174	YeongDoPS	0	0	-0.18	-0.01	0	-0.03	-0.01	-0.05	-0.01	-0.09	-0.09	0.02	-0.02	-0.04	-0.03	-0.04
175	PuSanJinPS	0	0	-0.1	0.01	0	-0.04	0	-0.05	-0.01	-0.04	-0.08	0.02	0	-0.03	-0.02	-0.02
176	DongRaePS	0	0	0	-0.01	0.03	0.01	0.02	-0.04	-0.01	-0.08	-0.09	0.02	0	-0.02	-0.01	0.01

177	NamGuPS	0	0	-0.11	0.09	0	0.02	0.02	-0.04	0.02	-0.05	-0.06	0.02	0	-0.02	-0.02	-0.03
178	BukGuPS	0	0	0.09	-0.01	0	0	0.01	0.03	0	0.03	0.02	0	0	0.04	0.03	0.03
179	HaeWunDaePS	0.01	0	-0.13	-0.01	0.01	0	0.02	-0.02	-0.01	-0.05	-0.09	0.01	0	-0.03	-0.01	-0.01
180	SaHaPS	0	0	0.11	-0.01	0	0.02	0	0.06	0.01	0.04	0.14	-0.04	0.01	0.03	0.02	0
181	GeumJeongPS	0	0	-0.4	-0.01	0	0.01	0.01	-0.05	-0.01	-0.09	-0.1	0.03	0	-0.06	-0.04	-0.04
182	GangSeoPS	0	0	-0.13	-0.01	0	0.01	-0.02	-0.04	-0.01	-0.06	-0.08	0.01	0	-0.03	-0.02	-0.02
183	YeonJePS	0.04	0	-0.23	-0.01	0	0	0.01	-0.05	-0.01	-0.09	-0.09	0.03	0	-0.04	-0.04	-0.05
184	SooYeongPS	0	0	-0.04	-0.01	0	-0.02	-0.03	-0.04	-0.01	0.14	-0.09	0.02	0.01	-0.04	-0.02	-0.03
185	SaSangPS	0.01	0	-0.02	-0.01	0.01	0.02	0.01	-0.02	0	0	0	0	0.01	0	-0.01	0.03
186	GiJangPS	0	0	-0.07	0.01	0	-0.01	0	-0.04	-0.01	-0.05	-0.08	0.01	-0.02	-0.01	0	-0.01
187	JoongGuUS	0	0	-0.01	0	-0.03	0	0	-0.01	0	-0.02	-0.02	0	0	-0.01	-0.01	0
188	NamGuUS	0	0	-0.02	0	0.01	0	0	0.02	0	0.02	0.02	0	0	0.02	0	0
189	DongGuUS	0	0	0.04	0	0.01	0	0	-0.01	-0.01	-0.02	-0.02	0	0	-0.01	-0.01	0
190	BukGuUS	0	0	0	0	0.01	0	0	-0.01	0	0.01	0	0	0	0	0.01	0
191	WoolJooUS	0	0	0.02	0.01	0.01	0	0	-0.01	0.01	-0.02	-0.01	0	0.01	-0.01	0	0
192	ChangWonGN	0.09	0	-0.04	0.01	0	0	0	-0.03	-0.01	-0.05	-0.06	0.01	0	-0.05	-0.04	-0.02
193	JinJooGN	0.03	0	-0.09	0	0	0	0	-0.03	-0.01	-0.05	-0.06	0.01	0	-0.05	-0.04	-0.03
194	TongYeongGN	-0.01	0	-0.12	-0.01	0	0	0	-0.03	-0.01	-0.05	-0.06	0.01	0	-0.05	-0.04	-0.03
195	SahCheonGN	0.16	-0.01	0.01	-0.01	0	-0.01	0	-0.03	-0.01	-0.05	-0.06	0.01	0	-0.05	-0.04	-0.03
196	GimHaeGN	0.01	0	0	0	0	0	0	-0.03	-0.01	-0.04	-0.05	0.01	0.01	-0.03	-0.02	-0.02
197	MilYangGN	0.11	0	-0.03	0.01	0	0	0	-0.03	-0.01	-0.05	-0.06	0.01	0	-0.05	-0.04	-0.03
198	GeoJeGN	-0.01	0	0.06	0	0	0	0	0.01	0.01	0.03	0.04	-0.01	0	0.06	0.04	0.02
199	YangSanGN	-0.01	0	0.06	0.01	0	0	0	0	0.02	0.01	0.05	-0.01	0.01	0.09	0.04	0.02
200	EuiRyeongGN	-0.01	0	0.06	0	0	0	0	-0.01	0	0.02	0	0	0	0.02	0.03	0.01
201	HamAhnGN	-0.01	0	0.06	0	0	0	0	-0.01	0.01	0.04	0.05	0	0	0.03	0.03	0.01
202	ChangNyeunGN	-0.01	0	0.07	0.01	0	0	0	0.01	0.01	0.03	0	0	0	0.01	0.04	0.01
203	GoSungGN	-0.01	0	0.07	0.01	0	0	0	0	0.01	0.04	-0.01	0	0	0.02	0.04	0.01
204	NamHaeGN	-0.01	0	0.07	0.03	0	0	0	0	0.01	0.03	-0.01	0	0.01	0.01	0.04	0.01
205	HaDongGN	-0.01	0	0.06	0	0	0	0	0	0.01	0.01	-0.02	0	0	0	0.03	0.01
206	SanCheongGN	-0.01	0	0.06	0	0	0	0	0.05	0.01	0.04	0.07	-0.01	0	0.04	0.02	0.04
207	HamYahngGN	-0.01	0	0.06	-0.01	0	0	0	0.08	0.01	0.05	0.08	-0.01	0	0.01	0.01	0.03
208	GeoChangGN	0	0	-0.06	0	0	0	0	-0.03	-0.01	-0.03	-0.04	0	0	-0.02	-0.03	-0.02
209	HabCheonGN	0	0	-0.03	-0.01	0	-0.01	0	-0.03	-0.01	-0.03	-0.02	0	0	0	-0.02	-0.02
210	ChunCheonGW	0.07	-0.03	-0.11	0	0.02	0	0	-0.04	-0.02	-0.04	-0.05	0.01	0.03	-0.05	-0.04	-0.06
211	WonJooGW	0	0	0	0	0.01	0	0	-0.02	0	0	0.01	0	-0.01	0.02	0.01	-0.01
212	GangLeungGW	0	0	-0.03	0	0	0	0	-0.02	0	0	0.01	0	0.01	0	0	-0.01

213	DongHaeGW	-0.01	0	0.01	0	0.01	0	0	0	0.01	0.02	0.04	-0.01	-0.01	0.01	0.01	0
214	TaeBaekGW	0.01	-0.01	-0.23	0	0.02	0	0	-0.04	-0.02	-0.03	-0.04	0.01	0.02	-0.03	-0.03	-0.05
215	SokChoGW	0	0	0.04	0.01	-0.03	0	0	0.01	0	-0.01	-0.03	0.01	-0.01	-0.01	0	-0.01
216	SamCheokGW	0	0	0.04	0	0	0	0	0.07	0.01	0	0	0	0	0.02	0.01	0.01
217	HongCheonGW	0	0	-0.01	0	0	0	0	-0.03	0	-0.01	0	0	-0.01	0.01	-0.01	-0.03
218	HoengSeungGW	0	0	0.02	0	-0.01	0	0	-0.03	0	-0.01	0	0	0	0.01	0	-0.02
219	YeongWolGW	0	0	0.03	0	-0.02	0	0	-0.01	0	-0.01	-0.03	0.01	-0.01	-0.01	0.01	-0.01
220	PyongChangGW	-0.01	0	0.04	0	-0.02	0	0	-0.02	0	-0.01	-0.03	0.01	-0.02	0	0.01	-0.01
221	JeongSeonGW	-0.01	0	-0.01	0	0	0	0	0.01	0.01	0.01	0.06	-0.01	0.01	0	0	-0.01
222	CheolWonGW	0	0	-0.04	0	0.01	0	0	0.03	0	0.01	0.04	-0.01	0.01	-0.02	0	-0.02
223	HwaCheonGW	-0.01	0	0.04	0	0	-0.01	0	0.01	-0.01	0.04	-0.01	0	0	-0.01	0	0.03
224	YangGooGW	0	0	0.05	0	-0.02	0	0	-0.02	-0.01	0.02	-0.03	0.01	-0.01	-0.01	-0.01	0.01
225	InJeGW	-0.01	0	0.04	0	0.01	0	0	0.06	0.01	0.01	0.02	-0.01	0.01	0.01	0.02	0.11
226	GoSeongGW	0	0	0.02	0	0.01	0	0	0.03	0.01	0	0.01	-0.01	0	0.02	0.02	0.07
227	YahngYahngGW	0	-0.01	0.03	0	-0.01	0	0	-0.03	-0.01	-0.02	-0.03	0	-0.01	0	-0.01	0.06
228	JejuJJ	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0
229	SeoGuiPoJJ	0	0	0.01	0	0	0	0	-0.01	0	0	0	0	0	0	0	-0.01