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New Happiness Indicator for Unhappy Koreans

Prof. Dr. Myungho Park

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New Happiness Indicator for Unhappy Koreans

Myungho Park (Honorary Professor)
Hankuk University of Foreign Studies

I. Introduction

Most Koreans feel unhappy, even though Korea has achieved remarkable performances in improving basic needs including per capita income, education, and life expectancy. Koreans' low level of happiness seems paradoxical since income, education, and health seem to be the most important components of happiness.

Most happiness indicators are composed of factors that affect happiness positively. This approach assumes that if you improve components of happiness, people become happier. Better Life Index (BLI) and World Happiness Index (WHI) are typical examples.

With the help of these indicators, we might guess why Koreans are unhappy. Low levels of happiness can be explained by the fact that some components of happiness are lower in Korea than in other countries. In reality, Korea has relatively low scores when it comes to the choice between work and leisure and the perception of corruption is high. However, this explanation alone is not sufficient to explain why Koreans are unhappy. Based on the results of a survey regarding the happiness of Koreans, we learned that Koreans are not happy mostly due to economic and social gaps.

This paper aims to identify which factors are the most important in determining the level of happiness of Koreans. To this end, we will create a new indicator that can comprehend the situation in Korea while making international comparisons possible.

II. Making of the Indicator

1. Structure of Indicators

The basic structure of the new happiness indicator consists of positive and negative categories affecting the happiness of the people. Each of these two categories is classified as material and social foundations.

Regarding the positive category, the material foundation includes basic elements such as income, employment, education, health, housing, and environment, while the social foundation includes family, social relations, community life, cultural leisure, and safety. Regarding the negative category, the material foundation includes income gap and employment gap, while the social foundation consists of gender gap and generational gap. (See Table 1 for details)

Table 1 Structure of Happiness Indicator

Categories	Sub-categories	Variables	Details
Positive factors	Physical Foundation	Income	GDP per capita, PPP (constant 2011 international $)
		Employment	Employment to population ratio, 15+, total (%) (modeled ILO estimate)
		Education	School life expectancy, primary to tertiary, both sexes (years) Gross enrolment ratio, primary to tertiary, both sexes (%)
		Health	Life expectancy at birth, total (years)
		Housing	Dwellings per 1000 inhabitants
		Environment	PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)
	Social Foundation	Family	Crude marriage rate (marriages per 1000 people) Fertility rate, total (births per woman)
		Social relation	trust in institutions and others Quality of support network
		Community life	Social participation
		Culture, leisure	Average annual hours actually worked per worker Time devoted to leisure and personal care
		Safety	Suicide mortality rate (per 100,000 population) Intentional homicide (rates per 100,000 population) Do you feel safe walking alone at night in the city or area where you live?
Negative factors	Physical Foundation	Income gap	Gini coefficient (disposable income, post taxes and transfers) Decile ratios of gross earnings (P90/P10)
		Employment gap	Share of temporary employment
	Social Foundation	Gender gap	Gross enrolment ratio, primary and secondary, gender parity index (GPI) Gender gap of employment to population ratio (Men - Women) Gender wage gap (Difference between median earnings, %)
		Generation gap	Age dependency ratio, old (% of working-age population) Youth unemployment rate (15-24) / Total unemployment rate 65+ Elderly Poverty rate / Total Poverty rate (Poverty rate after taxes and transfers, Poverty line 50%)

Source: Author's own

2. Data and sources

The data used in this study are the panel data of 31 OECD member countries, collected during 28 years from 1990 to 2017. The data largely consists of three types: time series data, survey data, and index-type data. When time series data or index data were missing, they were filled in by trend-extrapolation or interpolation. Missing survey data were filled in by step functions.

Table 2 Data and source

Variables	Details	Sources	Direction
income	GDP per capita, PPP (constant 2011 international $)	World Bank WDI	↑
employment	Employment to population ratio, 15+, total (%) (modeled ILO estimate)	International Labour Organization, ILOSTAT database	↑
education	School life expectancy, primary to tertiary, both sexes (years)	UNESCO UIS statistics	↑
enrolment	Gross enrolment ratio, primary to tertiary, both sexes (%)	UNESCO UIS statistics	↑
life expectancy	Life expectancy at birth, total (years)	United Nations Population Division. World Population Prospects	↑
housing	Dwellings per 1000 inhabitants	OECD, New OECD Affordable Housing Database	↑
environment	PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)	World Bank WDI (Brauer, M. et al. 2016, for the Global Burden of Disease Study 2016.)	↓
Family	Crude marriage rate (marriages per 1000 people)	OECD stats, Family Database	↑
family	Fertility rate, total (births per woman)	United Nations Population Division. World Population Prospects	↑
trust		World Value Survey	↑
social relation	Quality of support network	OECD Better Life Index (Source: Gallup World Poll)	↑
social participation		World Value Survey	↑
working hours	Average annual hours actually worked per worker	OECD stats, average annual hours actually worked per worker Dataset	↓
culture, leisure	Time devoted to leisure and personal care	OECD Better Life Index	↑
safety	Suicide mortality rate (per 100,000 population)	OECD (2018) Suicide rates; WHO Global Health Observatory Data Repository	↓
safety	Intentional homicide (rates per 100,000 population)	World Bank, Sustainable Development Goals database (UN Office on Drugs and Crime's International Homicide Statistics);	↓

safety	Do you feel safe walking alone at night in the city or area where you live?	OECD, Society at a Glance 2014 (Source: Gallup World Poll)	↑
Gini coefficient	Gini (disposable income, post taxes and transfers)	OECD stats, Income Distribution and Poverty Dataset	↓
Decile ratio	Decile ratios of gross earnings (P90/P10)	OECD stats, Decile ratios of gross earnings Dataset	↓
Share of temporary employment	Share of temporary employment	OECD stats, Incidence of permanent employment Dataset	↓
Education	Gross enrolment ratio, primary and secondary, gender parity index (GPI)	UNESCO UIS statistics	↑
employment gap	Gender gap of employment to population ratio (Men - Women)	International Labour Organization, ILOSTAT database	↓
income gap	Gender wage gap (Difference between median earnings, %)	OECD stats, Decile ratios of gross earnings Dataset	↓
Age dependency ratio	Age dependency ratio, old (% of working-age population)	World Bank WDI (Source: United Nations, World Population Prospects)	↓
Youth unemployment	Youth unemployment rate (15-24) / Total unemployment rate	OECD Employment Outlook	↓
Elderly Poverty	65+ Elderly Poverty rate / Total Poverty rate (Poverty rate after taxes and transfers, Poverty line 50%)	OECD stats, Income Distribution and Poverty Dataset	↓

Footnote: '↑' means that the higher, the better while '↓' means that the lower, the better.
Source: Author's own

When data were missing over the entire period, it was impossible to fill in data and the country itself was excluded from the analysis. Data analysis was conducted at two levels: One was to keep track of global trends over the past two decades by using the panel data, and the other to capture national features of the 31 countries. First, at the global level, overall trends in each category of positive factors and negative factors over the past 28 years are analyzed. Second, at the national level, to capture the changes that have occurred in each country during the period, this study conducted both static analysis by calculating rankings at the starting point (1990) and the ending point (2017), and dynamic analysis by examining the trend of the whole period.

The new Happiness Indicator uses the standardization method following Osberg and Sharpe (2005). The standardization of the Linear Scaling Method (LSM) is as follows:

Standardization = (Value-Min)/(Max-Min)

Max = global Max +|global Max * 10%|,

Min = global Min - |global Min * 10%|

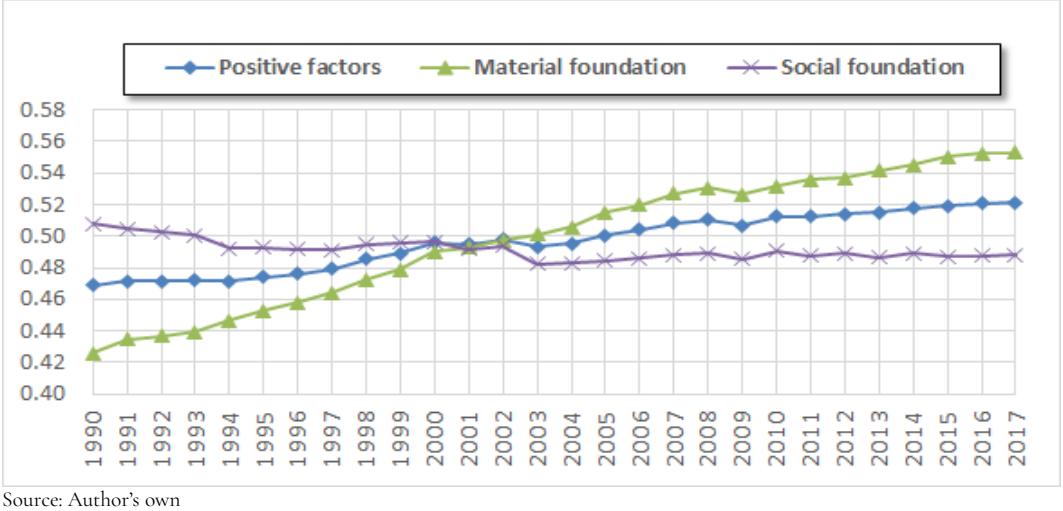
Normalized value is represented in a linear form, ranging between 0 and 1. This conversion allows cross-border and temporal comparisons. It also can avoid convergence toward the mean value that other alternative standardization has. Osberg and Sharpe (2005) adopted the normalization method from the HDI formula, simply modifying the maximum and minimum values. The maximum value is global Max + 10% and the minimum value is Min – 10%.

III. Analysis Results

1. Global trends

We examined the level of happiness in the OECD countries during the period 1990-2017. Firstly, positive factors of the new happiness indicator countries showed a steady improvement with an annual average growth rate of 0.39% during the 1990-2017 period.

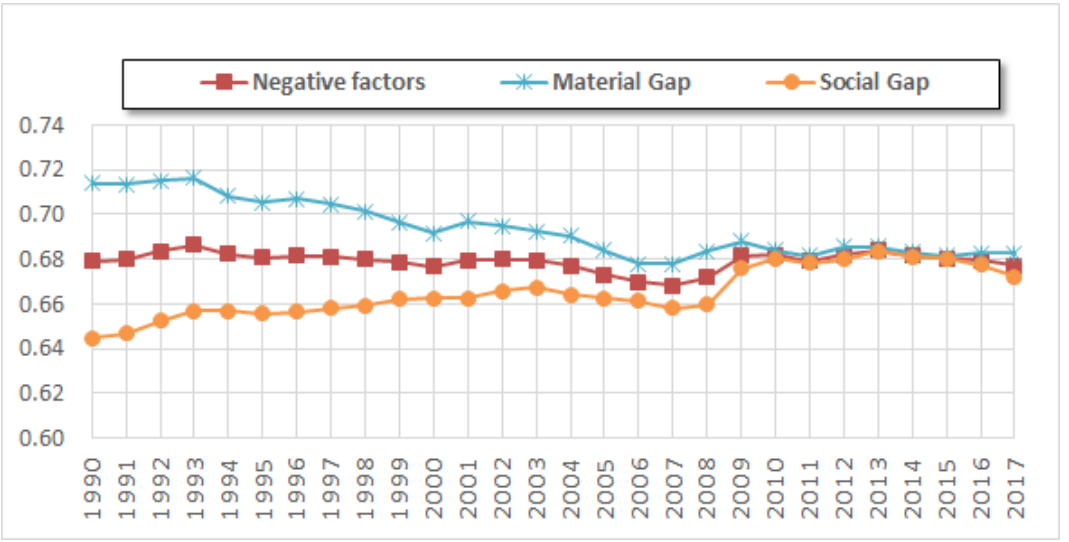
Figure 1. Trends of positive factors at the category and sub-category level: OECD countries



Source: Author's own

Among the two sub-categories of the positive factors, the material foundation had grown at a faster speed of 0.97% per year than the social foundation which showed a negative growth rate of –0.15%. Regarding the negative factors, OECD countries showed a moderate decline with an average annual growth rate of –0.01%. While the material gaps had deteriorated by an annual average of -0.16%, the social gap improved by 0.15%.

Figure 2. Trends of negative factors at the category and sub-category level: OECD countries



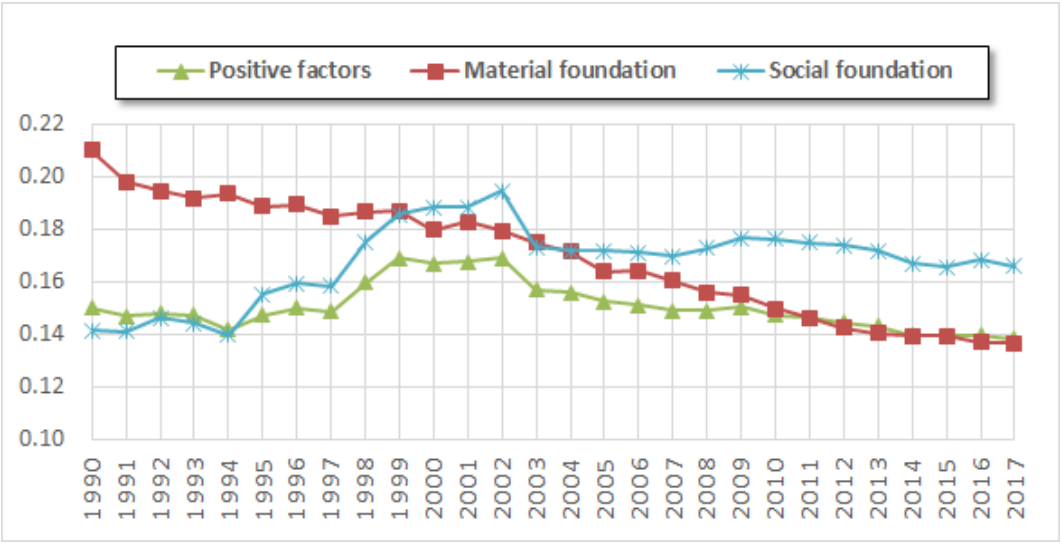
Source: Author's own

2. Coefficient of variation

The coefficient of variation is a value calculated by dividing the standard deviation by the average. The coefficient of variation at a specific time means how far the country's index values are scattered around the average. If the coefficient of variation increases across time, it means that the gap between OECD member countries increases. On the other hand, if the coefficient of variation decreases across time, it means that the gap between OECD member countries reduces.

As shown in [Figure 3], the coefficients of variation of the positive factors had increased until the 1990s and the early 2000s, while it has decreased since the early 2000s, showing the convergence among the countries. Regarding the positive factors, the gap between member countries appeared to have increased and then decreased since the early 2000s. However, the trends in the material and social foundations showed different patterns. In material foundation, the gap continued to decrease, while the social gap showed a pattern of initially increasing and then decreasing.

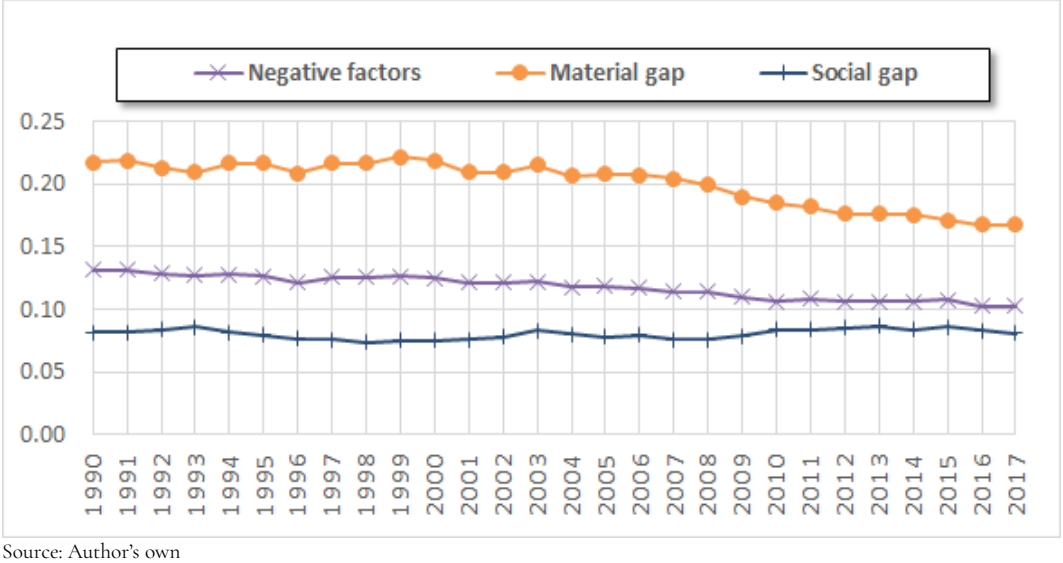
Figure 3. Coefficient of variation of positive factors at the category and sub-category level: OECD countries



Source: Author's own

The coefficient of variation of the negative factors had shown a moderately declining pattern, which suggests that the gap between the OECD member countries has been declining very slowly.

Figure 4. Coefficient of variation of negative factors at the category and sub-category level: OECD countries



Source: Author's own

3. Relative position of Korea

In Korea, the positive factors showed an average annual increase of 0.27%, while the negative factors showed a slight deterioration of –0.05%. Compared to the average of OECD countries, both the positive and negative factors are below the average level of OECD countries, while the gap between Korea and OECD countries has improved.

Looking at changes during that period, the trend of positive factors in Korea showed a gradual increase of -0.03% in the 1990s, but has since steadily increased from the 2000s onwards. In the 2000s, the rate of improvement was faster than the OECD average growth rate. Regarding the negative factors in Korea, there were fluctuations depending on the period, but overall there was a slight downward trend of –0.05% since the year 1990.

Table 3 Trends of Korea at the category and sub-category level

	Level			AAGR (%)		
	Year	OECD Average	Korea	Year	OECD Average	Korea
Positive factors	1990	0.469	0.398	90-00	0.55	-0.03
	2000	0.496	0.397	00-10	0.33	0.60
	2010	0.512	0.422	10-17	0.25	0.21
	2017	0.521	0.428	90-17	0.39	0.27
Negative factors	1990	0.679	0.502	90-00	-0.03	0.02
	2000	0.677	0.503	00-10	0.07	-0.31
	2010	0.682	0.488	10-17	-0.10	0.23
	2017	0.677	0.496	90-17	-0.01	-0.05

Source: Author's own

Analysis results of the new happiness indicator showed that Korea's ranking is at the bottom among the OECD countries. Positive factors remain at the 23rd place among the 27 countries, and the negative factors are the lowest among the 30 countries.

Table 4 Korea's ranking according to the new Happiness Indicator

Classifications [1]			AAGR 90-17 (%)	Ranking						Relative position[3]	
categories	Sub-categories	Variables		1990	2000	2010	2017	Ranking change[2] 90-17		1990	2017
Positive factors (27)			0.27	23	23	23	23	~	0	L	L
	Material foundation (28)		1.11	22	23	23	23	~	-1	L	L
		income (31)	7.80	28	25	22	20	↑	8	L	M

	employment (31)	0.00	10	14	10	11	~	-1	M	M
	education (31)	1.76	15	14	11	17	~	-2	M	M
	health (31)	2.22	26	25	16	10	↑↑	16	L	M
	housing (28)	0.67	22	24	24	24	~	-2	L	L
	environment (31)	-0.50	26	28	29	30	↓	-4	L	L
Social foundation (31)		-0.54	21	26	27	25	↓	-4	M	L
	family (31)	-2.61	5	6	13	12	↓	-7	H	M
	social relation (31)	-0.70	21	27	24	25	↓	-4	M	L
	community life (31)	-0.45	22	23	24	24	~	-2	M	L
	culture, leisure (31)	1.55	30	29	28	29	~	1	L	L
	safety (31)	-0.66	15	26	30	30	↓↓	-15	M	L
Negative factors (30)		-0.05	29	29	29	30	~	-1	L	L
Material gap (30)		0.06	27	27	28	26	~	1	L	L
	income gap (31)	-0.52	21	24	27	27	↓	-6	M	L
	employment gap (30)	0.98	28	28	27	26	~	2	L	L
social gap (31)		-0.16	31	31	31	31	~	0	L	L
	gender gap (31)	0.93	31	30	31	31	~	0	L	L
	generation gap (31)	-1.10	28	29	31	31	↓	-3	L	L

Note: Source: Author's own

1) The parenthesis indicates the number of countries except for the missing countries.

2) Ranking during the period increased by more than 10 steps '↑↑', by more than 3 steps '↑', decreased by more than 10 steps '↓↓', decreased by more than 3 steps '↓', changed less than 2 steps '~'

3) The relative level is indicated as "H (High)" in the top 30%, "M (Middle)" in the middle 40%, and "L (low)" in the bottom 30%.

As seen in Figure 6, Korea's weakness lies in negative rather than positive factors. In particular, the negative factors in Korea deteriorated more rapidly than in other OECD countries.

IV. Application and Findings

1. Application

Panel regression was attempted to check the determinants of happiness. As shown in the equation below, the level of happiness consists of positive and negative factors.

To complement the data, we divided OECD member countries into two groups: happy countries and unhappy countries. Korea belongs to the group of unhappy countries.

$$\text{Happiness}_{i,t} = \alpha_0 + \alpha_1 P_{i,t} + \alpha_2 N_{i,t} + \varepsilon_{i,t}$$

Table 5 *Analysis result of the panel regression*

	Dependent variable: Happiness level (UN Happiness Report)	
	OECD member countries	Unhappy countries (Korea, Mexico, Chile, Poland)
Positive factors	1.502*** (0.287)	1.659*** (0.605)
Negative factors	-1.144*** (0.208)	1.734** (0.718)
Constant	0.547** (0.211)	-1.132** (0.424)
R^2	within: 0.17 overall: 0.32	within: 0.25 overall: 0.02
F-statistic (p-value)	44.1 (<0.001)	29.6 (<0.001)
Number of obs.	338	52

Note:
1) Fixed effect model and parentheses are standard errors.
2) Superscripts *, **, and *** for the coefficient estimates are statistically significant at significance levels of 10%, 5%, and 1%, respectively.
Source: Author's own

The analysis result shows that for all OECD countries, positive factors were confirmed to be important determinants of happiness. Regarding negative factors, the two groups of the OECD countries show different behavior. Meanwhile, in developed countries with high levels of happiness, negative factors do not reveal a significant effect on the level of happiness, while in the group of countries with low levels of happiness, including Korea, negative factors appear to play a decisive role in determining the level of happiness.

2. Findings

To examine the determinants of happiness, we undertook the panel regression analysis for the 31 OECD member countries. In OECD member countries, the positive factors are highly correlated with the level of happiness while the negative factors are negatively correlated with the level of happiness. This result shows that even though some countries like the US have relatively big (material and social) gaps, they feel happy. For most OECD countries, the positive factors matter more importantly than the negative factors.

However, when it comes to Korea, the negative factors have a significant effect on the level of happiness. The countries that have both positive and negative factors in the bottom 30% of the OECD countries feel unhappy largely due to the negative factors.

As a result, it is highly recommended to include both positive and negative factors in the Happiness indicator to reflect the subjective feelings of Koreans.