


Does Income (Re)distribution Matter for Subjective Well-being? Evidence from Cross-country Panel Data

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Objectives. This study empirically investigates the effects of income inequality and income redistribution policy on country-level subjective well-being. **Methods.** The paper uses panel data of 134 countries from 2005 to 2017. The fixed effect model with time and country dummies is employed. **Results.** We find that a higher inequality level significantly deteriorates happiness in a country with high income inequality, while it does not affect happiness in a country with a low level of inequality. In addition, stronger redistributive policies improve subjective well-being of countries that have high income inequality, while the policies do not have significant effect on subjective well-being in countries with relatively low-income inequality. Furthermore, this paper finds that people are affected by *relative* levels of income inequality as income grows: people in developed countries may have higher standard for income equality compared with those in developing countries. **Conclusions.** The policy implication of this paper is that an active income redistribution policy can improve the country level subjective well-being if a country's income inequality level is higher than its peer group, regardless of whether it is a developed or developing country.

Based on the utilitarian philosophy, macroeconomic policymakers have aimed to maximize satisfaction for all members of a society. In this regard, it is important to understand the factors or determinants of overall subjective well-being. In the utility function of typical macroeconomic models, aggregate income or consumption is assumed to define overall welfare levels. As direct measures for subjective well-being have become more available, studies are looking at previously overlooked macroeconomic determinants of happiness.

Most of the earlier research has focused on the relationship between income level and happiness. Easterlin (1974, 1995, 2001) found that there is no statistically significant positive correlation between gross domestic product (GDP) per capita and subjective satisfaction. Conversely, Deaton (2008), Di Tella, MacCulloch, and Oswald (2003), and Veenhoven (1991) claimed that a higher aggregate income significantly increases the overall happiness of a society.

Based on the studies on the correlation between GDP and happiness, various other studies examined the role of income distribution in determining the effects of GDP on average country-level happiness (Alesina, Di Tella, and MacCulloch, 2004; Blanchflower and Oswald, 2004; Graafland and Lous, 2018; Graham and Felton, 2006; Mikucka, Sarra-cino, and Dubrow, 2017; Oishi, Kesebir, and Diener, 2011). Moreover, some studies have

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specifically looked into the correlation between inequality and economic growth (Alesina and Rodrik, 1994; Banerjee and Duflo, 2003; Persson and Tabellini, 1994; Lin et al., 2009). If a society consists of a handful of rich people while the majority are poor, the average income level will depend heavily on the high income of the few rich people. Thus, an increase in average income may not be conducive to the happiness of society as a whole. In countries with severe inequality, disparity in income gets aggravated over time, thus creating the feeling of relative deprivation for citizens in the lower income group. Blanchflower and Oswald (2004) showed that relative income has a significant effect on individual subjective well-being. Furthermore, Eksi and Kaya (2016) revealed that if a country has relatively lower income compared to richer countries, such relative deprivation may negatively affect average subjective well-being of a country.

Apart from the perspective on relative income, studies have investigated other links between income inequality and subjective well-being. Alesina, Di Tella, and MacCulloch (2004) and Graham and Felton (2006) suggested that income inequality can be a proxy of social mobility or the perception of fairness, which would lower overall happiness. Comparing the cases of the United States and Europe, Alesina, Di Tella, and MacCulloch (2004) found that people have differing attitudes toward inequality based on a country's social mobility and ideological orientation. The study empirically showed that, even in advanced countries with relatively similar income levels, citizens' expectation of income equality differs, consequently affecting overall subjective well-being. Kelley and Evans (2017) even found that income inequality is positively associated with subjective well-being for developing countries that are in the earliest stage of development. By empirically studying survey data from China, Wang et al. (2014) showed that the correlation between inequality and happiness follows the tunnel effect. Subjective well-being is positively associated with income inequality when the overall inequality level is low, yet, when the income inequality passes the threshold, inequality is negatively associated with the subjective well-being. Some research pointed to factors such as opportunity and hope as vital in determining the effect of inequality on the subjective well-being (Cheung, 2015; García-Muñoz, Milgram-Baleix, and Odeh-Odeh, 2019). Graham and Felton (2006), in their findings from Latin American countries, argued that income inequality signals persistent unfairness in the region. Schröder (2017) emphasized that changes of inequality level, rather than the absolute level, have meaningful impact on the subjective well-being. Oishi, Kesebir, and Diener (2011), using empirical evidence from the United States, further corroborated that income inequality carries a statistically significant effect on perceived unfairness and general trust. Delhey and Dragolov (2013), by studying 30 European countries, found out that inequality is adversely associated with happiness of Europeans. Recent studies reveal that income inequality impairs social trust (Barone and Mocetti 2016; Graafland and Lous, 2018). Despite the abundance of studies on the correlation between inequality and happiness, there is no empirical study that investigated the varying impact of income inequality on happiness according to the country's level of income inequality. In fact, previous empirical findings have neglected the possibility that the effects of income inequality could vary depending on the level of income inequality or concluded that its effect on subjective well-being is ambiguous (Berg and Veenhoven, 2010; Graham and Felton, 2006; Schneider, 2015).

If income inequality adversely affects subjective well-being, it raises the question of whether an income redistribution policy would improve the well-being of a society. However, there are very few studies on the impact of income redistribution policies on happiness. Oishi, Kushlev, and Schimmack (2018) explored the effect of progressive taxation on subjective well-being in the United States from 1962 to 2014 and revealed

that less wealthy citizens, who comprise the lowest 40 percent of the population, were happier with progressive taxation, while the richest 20 percent were less happy with such a policy. Oishi, Schimmack, and Diener (2012) used cross-sectional data from 54 countries and showed that a progressive tax system is associated with higher levels of happiness. Both Oishi, Schimmack, and Diener (2012) and Oishi, Kushlev, and Schimmack (2018) focused on the progressivity of tax rates. However, income redistribution can be also implemented through transfers to the poor. We fill this research gap by analyzing the impact of government's income redistribution policy, including income tax and transfer, on subjective well-being. This is an interesting question, as a dissatisfaction with income inequality is not automatically associated with a satisfaction with a stronger income redistribution policy. It is also possible that a stronger progressive taxation system will lead to tax resistance from people, thus, negatively affecting subjective well-being.

This study uses a new and rich cross-country panel data of 134 countries from 2005 to 2016 to investigate the role of income distribution in determining the effects of aggregate income on a society's overall happiness. In the full sample analyses, we find that income inequality, along with GDP per capita, is a significant determinant of country-level happiness. Assuming that income inequality can have differing effects on happiness depending on the income level of countries, this study divides the sample into two smaller samples of 35 developed and 99 developing countries, and then divides each of the smaller sample into subsamples of countries with higher than median Gini and lower than median Gini. For the unequal countries inequality always has a significantly negative effect on happiness in the full sample as well as in developing and developed countries' groups. Surprisingly, even though the median Gini was set much lower for the developed countries' group, income inequality still significantly diminishes happiness in developed countries with a higher than median Gini. Conversely, subjective well-being of the countries in the relatively equal subgroups of developing and developed countries are unaffected by income inequality. This result led us to consider the important question of *relativity*, which is discussed in the later section. We show that redistributive policy enhances country-level happiness in groups with high income inequality. Moreover, we find that income redistribution policy does not hamper subjective well-being in countries with low income inequality.

The contribution of this study is threefold. First, to our best knowledge, this study is the first to show that the effects of income inequality on subjective well-being vary depending on the level of income inequality and that developed economies demand a higher level of equality than developing countries. Second, it is also the first study to investigate the effects of redistributive income policy on happiness using a cross-country panel data of 134 countries. Unlike the studies of Oishi et al. (Oishi, Schimmack, and Diener, 2012; Oishi, Kushlev, and Schimmack, 2018), both of which focused on the progressivity of tax rates in consideration of redistributive policies, this study considers the resulting income redistribution after taxes and transfers. Lastly, this study is one of the few studies to analyze the effects of income distribution in developing countries. In this regard, this study is the first to investigate the effects of redistribution policies on subjective well-being of developing countries.

The rest of this paper is organized as follows. The second section introduces the empirical models to be estimated, and the third section describes the data set. The fourth section reports the results of the fixed effect models and discusses the corresponding results. Lastly, the fifth section concludes the article.

Empirical Model

The empirical model to estimate the determinants of subjective well-being is as follows:

$$\begin{aligned} \log (HAPPY_{i,t}) = & \beta_0 + \beta_1 \log (GDPPC_{i,t}) + \beta_2 \log (LIFE_EXP_{i,t}) \\ & + \beta_3 \log (FREEDOM_{i,t}) + \beta_4 \log (SOCIAL_{i,t}) \\ & + \beta_5 \log (GINI_{i,t}) + \alpha_i + \lambda_t + \varepsilon_{i,t} \end{aligned} \quad (1)$$

In the model, subscripts $i = 1, \dots, 134$ and $t = 2005, 2006, \dots, 2017$ denote the cross-section and time dimensions, respectively. Equation (1) assumes that a country's overall happiness level ($HAPPY_{i,t}$) is determined by independent variables, such as GDP per capita ($GDPPC_{i,t}$), healthy life expectancy at birth ($LIFE_EXP_{i,t}$), freedom to make life choices ($FREEDOM_{i,t}$), social support ($SOCIAL_{i,t}$), and disposable Gini index ($GINI_{i,t}$). The term α_i and λ_t are country and time-fixed effects, respectively. Lastly, $\varepsilon_{i,t}$ represents the error term.

The model assumes that a country's overall subjective well-being can be explained by income (GDP per capita), physical health (healthy life expectancy at birth), feelings of liberty (freedom), the society's feeling of solidarity (social support), and income inequality (Gini). The main econometric problem in the two estimation models would be the omitted variable bias. There is neither a dominant theory regarding the determinants of a country's average happiness level nor sufficient data. We took advantage of the fixed effects model for this issue. Cross-national differences in the understanding of happiness are likely to be explained by elements, such as language, culture, and religion, which can be used as country-fixed effects because these variables can be safely assumed to be time-invariant, given the relatively short time frame between 2005 and 2017. In addition, time-fixed effects capture the time trend, effects of technological progress or global events in a specific year, such as the global financial crisis and Eurozone public debt crisis.

Extending from our first empirical model, which investigates the Gini index to understand the effect of inequality on happiness, we add effective progression (EP) as an explanatory independent variable. We use the formula for EP from Musgrave and Thin (1948):

$$EP = \frac{(1 - Disposable\ Gini)}{(1 - Market\ Gini)} \quad (2)$$

Recalling that *Market Gini* is the before-tax-and-transfer income distribution and *Disposable Gini* is the after-tax-and-transfer income distribution, the change rate from *Market Gini* to *Disposable Gini* indicates the strength of the redistribution policy. According to equation (2), EP is greater when *Market Gini* is higher than *Disposable Gini*, which demonstrates that the redistribution policies are making the income distribution more equal. In other words, the higher EP value indicates a stronger redistributive policy or higher level of progressivity of the fiscal policy.

The second estimation model considers EP as one of the independent variables:

$$\begin{aligned} \log (HAPPY_{i,t}) = & \beta_0 + \beta_1 \log (GDPPC_{i,t}) + \beta_2 \log (LIFE_EXP_{i,t}) \\ & + \beta_3 \log (FREEDOM_{i,t}) + \beta_4 \log (SOCIAL_{i,t}) \\ & + \beta_5 \log (GINI_{i,t}) + \beta_6 \log (EP_{i,t}) + \alpha_i + \lambda_t + \varepsilon_{i,t} \end{aligned} \quad (3)$$

TABLE 1
Descriptive Statistics: Full Sample

Variable	Observation	Mean	Std. Dev.	Min	Max
<i>Happiness</i>	1,562	5.434	1.121	2.662	8.019
	1,562	1.671	0.212	0.979	2.082
<i>ln(Happiness)</i>					
<i>GDPPPC</i>	1,465	19,719.16	19,705.58	794.909	113,553.6
<i>ln(GDPPC)</i>	1,465	9.329	1.16	6.678	11.64
<i>Life_Exp</i>	1,553	62.25	7.961	37.766	76.536
<i>ln(Life_Exp)</i>	1,553	4.122	0.136	3.631	4.338
<i>Freedom</i>	1,533	0.729	0.145	0.258	0.985
<i>ln(Freedom)</i>	1,533	−0.339	−0.223	−1.357	−0.015
	1,549	0.811	0.119	0.29	0.987
<i>Social_Support</i>					
<i>ln(Support)</i>	1,549	−0.223	0.168	−1.237	−0.127
<i>Gini</i>	1,109	37.395	7.617	23.6	61.5
<i>ln(Gini)</i>	1,109	3.601	0.205	3.161	4.119
<i>EP</i>	1,109	1.172	0.145	0.915	1.518
<i>ln(EP)</i>	1,109	0.151	0.12	−0.089	0.417

NOTE: GDP per capita (GDPPC) is calculated in international dollars. EP refers to effective progression. All numbers are rounded off to three decimal places. Gini index is in percentage.

By adding the EP variable, the model aims to find out whether the redistribution policies affect subjective well-being and, if so, to what degree. It is worth noting that EP represents the degree of the income redistributive policies, and *Disposable Gini* is the resulting income distribution after these policies are implemented. Thus, a higher EP value could be correlated with a lower disposable income Gini. Therefore, we add *Disposable Gini* and EP one by one in the regressions.

Data and Descriptive Statistics

The independent variables, except the Gini index, were chosen from the database of the World Happiness Report 2018, which presents the data gathered from the Gallup World Poll surveys (Helliwell, Layard, and Sachs, 2018). GDP per capita is purchasing power parity adjusted to constant 2011 international dollars according to the World Development Indicators. Healthy life expectancy at birth series are originally from the World Health Organization, but are interpolated by Helliwell, Layard, and Sachs (2018). Social support is a series of binary answers from the Gallup World Poll to the question of whether people have relatives or friends to help the respondent when he or she is in need. Freedom to make life choices represents the average answer to the question of whether the respondent is satisfied with the right to choose life at will. Gini inequality index is sourced from the Standardized World Inequality Database, which is based on Solt (2019). This database is originally based on Solt (2009). In the regression analysis, we use the after-tax-and-transfer Gini index. The happiness variable used in the regression analysis is from the results of the Gallup World Poll surveys from 2005 to 2017 for 134 countries (Helliwell, Layard, and Sachs, 2018). The Gallup World Poll surveys for both developed and developing countries have made a cross-country analysis possible.

Table 1 summarizes the results of the descriptive statistics for 134 countries including the independent variable, happiness, and other dependent variables, such as GDP per

TABLE 2
Descriptive Statistics: Developed Countries

Variable	Observation	Mean	Std. Dev.	Min	Max
<i>Happiness</i>	380	6.613	0.775	4.667	8.019
	380	1.882	0.122	1.541	2.082
<i>ln(Happiness)</i>					
<i>GDPPPC</i>	370	44,285.35	16,905.52	10,289.81	113,553.6
<i>ln(GDPPC)</i>	370	10.628	0.389	9.239	11.64
<i>Life_Exp</i>	380	70.863	2.523	62.247	76.536
<i>ln(Life_Exp)</i>	380	4.26	0.036	4.131	4.338
<i>Freedom</i>	380	0.812	0.131	0.369	0.971
<i>ln(Freedom)</i>	380	-0.224	0.182	-0.997	-0.029
	378	0.91	0.05	0.687	0.987
<i>Social_Support</i>					
<i>ln(Support)</i>	378	-0.959	0.057	-0.376	-0.013
<i>Gini</i>	334	30.762	4.253	23.7	41
<i>ln(Gini)</i>	334	3.417	0.137	3.165	3.714
<i>EP</i>	334	1.311	0.117	1.022	1.518
<i>ln(EP)</i>	334	0.267	0.093	0.022	0.417

NOTE: All numbers have been rounded off to three decimal places. Gini index is in percentage.

TABLE 3
Descriptive Statistics: Developing Countries

Variable	Observation	Mean	Std. Dev.	Min	Max
<i>Happiness</i>	1,182	5.055	0.937	2.662	7.615
	1,182	1.603	0.189	0.979	2.03
<i>ln(Happiness)</i>					
<i>GDPPPC</i>	1,095	11,418.26	12,254.23	794.909	10,4091.1
<i>ln(GDPPC)</i>	1,095	8.89	0.994	6.678	11.553
<i>Life_Exp</i>	1,173	59.459	7.072	37.766	69.867
<i>ln(Life_Exp)</i>	1,173	4.078	0.127	3.631	4.247
<i>Freedom</i>	1,153	0.702	0.14	0.258	0.985
<i>ln(Freedom)</i>	1,153	-0.377	0.222	-1.357	-0.015
	1,171	0.779	0.118	0.29	0.97
<i>Social_Support</i>					
<i>ln(Support)</i>	1,171	-0.268	0.172	-1.237	-0.031
<i>Gini</i>	775	40.253	6.935	23.6	61.5
<i>ln(Gini)</i>	775	3.68	0.177	3.161	4.119
<i>EP</i>	775	1.112	0.111	0.915	1.509
<i>ln(EP)</i>	775	0.101	0.094	-0.089	0.412

NOTE: All numbers have been rounded off to three decimal places. Gini index is in percentage.

capita, life expectancy, freedom, social support, Gini index, and EP. Table 2 represents the statistical data for 35 developed countries with the corresponding variables. Table 3 gives the statistics for 99 developing countries. We use the International Monetary Fund's classification, and the list of the developed countries is provided in the Appendix.

The tables show that, on average, people in developed countries are more satisfied with their lives than those in the developing countries. The average happiness level is 5.434 in the full sample, 6.613 in developed countries, and 5.055 in developing countries. The developed countries' average per capita GDP level is almost four times that of the

developing countries. People in developed countries are expected to live 10 more healthy years than those in developing countries. In addition, the freedom and social support levels are also higher in developed countries. Lastly, the tables for the descriptive statistics indicate that income inequality is much lower and the level of EP is much higher in developed countries. These findings might suggest that developed countries have been implementing stronger income distribution policies, and as a result, they have lower income inequality.

Results

The estimation results for the baseline model (1) are reported in Table 4. Columns (1) and (2) represent the results for the full sample of 134 countries. Columns (3) and (4) show the results for countries with low Gini (equal to or less than the median Gini of 36.7). Columns (5) and (6) indicate results for countries with high Gini (higher than 36.7).

In the full sample of column (1), when only $\ln(\text{GDPPC})$ and $\ln(\text{Gini})$ are controlled, the Gini coefficient is estimated to be negative at 1 percent level. Therefore, a 1 percent increase in income inequality is associated with decrease in happiness by 0.339. As shown in column (2), the result remains robust for the full sample when other variables are controlled. The coefficient for income inequality is -0.309 at 1 percent level. In addition, as expected, average income level, feelings of freedom, and social support positively affect overall subjective well-being at the 1 percent significance level. Such explanatory power of the above-mentioned variables explains slight decrease in the absolute value of coefficient for income inequality. On the other hand, in column (3), for low-Gini countries, inequality is an insignificant factor for happiness. Instead, for relatively equal countries in column (3), a 1 percent increase in GDP per capita is associated with 0.313 increase in subjective well-being at the 1 percent significance level. In column 4, inequality remains statistically insignificant, while GDP per capita, freedom, and social support each affect happiness by 0.260, 0.127, and 0.202, respectively. However, for high Gini countries in column (5), 1 percent increase in inequality is associated with 0.606 decrease in happiness at the 1 percent level. It is important to note that, even with the introduction of other variables, 1 percent increase in inequality is associated with reduction of happiness by 0.527 % at the 1 percent level. Moreover, the coefficient for inequality has the highest absolute value among all independent variables. Slight reduction in the absolute value of the coefficient for inequality may be due to the statistically significant explanatory power of coefficients of freedom and social support each by 0.109 and 0.170, both at the 5 percent level.

The examination of Table 4 demonstrates that income inequality deteriorates country-level subjective well-being only in those countries with high income inequality. Yet, income inequality does not affect subjective well-being in countries with a relatively low income inequality.

In Table 5, EP is introduced as an additional independent variable to the original baseline model to determine whether redistributive policies have a significant effect on country-level happiness. For the full sample, EP does not have a significant effect when Gini is not considered. However, when both inequality and EP are considered, Gini has a negative coefficient of -0.390 at the 1 percent level and EP has a positive coefficient of 0.540, although at the 10 percent significance level.

In the low-Gini group, EP and inequality are insignificant to happiness level. We think this result is in line with the fact that inequality is not a significant factor that affects happiness level in relatively equal countries, as shown in the regression analysis of Table 4. Since

TABLE 4
Estimation Results for the Baseline Model

Variable	Dependent Variable: <i>ln(Happiness)</i>				
	Full Sample		Low Gini (<i>Gini</i> ≤ 36.7)		High Gini (<i>Gini</i> > 36.7)
	(1)	(2)	(3)	(4)	(5)
<i>ln(GDPPC)</i>	0.237*** (−0.05)	0.213*** (0.048)	0.313*** (−0.069)	0.260*** (0.068)	0.223*** (−0.08)
<i>ln(Life_Exp)</i>		−0.521 (0.325)		−0.211 (0.423)	−0.500 (0.380)
<i>ln(Freedom)</i>		0.111*** (0.030)		0.127*** (0.031)	0.109*** (0.044)
<i>ln(Support)</i>		0.175*** (0.058)		0.202** (0.083)	0.170** (0.075)
<i>ln(Gini)</i>	−0.339*** (−0.128)	−0.309*** (0.116)	0.038 (−0.195)	−0.012 (0.187)	−0.527*** (−0.169)
Constant	0.639 (−0.799)	2.992* (1.578)	−1.484 (−1.204)	0.170 (1.866)	3.699* (2.059)
Observations	1,065	829	523	401	542
R-squared	0.12	0.154	0.179	0.243	0.114
Number of countries	134	127	66	63	75

NOTE: The regressions are controlled for country and year dummies. Clustered standard errors by country are reported in parentheses. ***, **, and * denote estimates, which are statistically significant at the 1 percent, 5 percent, and 10 percent levels, respectively.

TABLE 5
Estimation Results for the Baseline Model with Effective Progression

Dependent Variable: <i>ln(Happiness)</i>								
Variable	Full Sample			Low Gini (<i>Gini</i> ≤ 36.7)			High Gini (<i>Gini</i> > 36.7)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>ln(GDPPC)</i>	0.245*** (-0.05)	0.245*** (-0.046)	0.225*** (-0.047)	0.307*** (-0.068)	0.259*** (-0.065)	0.259*** (-0.067)	0.212** (-0.086)	0.223** (-0.093)
<i>ln(Life_Exp)</i>		-0.533 (-0.324)	-0.5 (-0.32)		-0.202 (-0.445)	-0.201 (-0.437)		-0.549 (-0.373)
<i>ln(Freedom)</i>		0.114*** (-0.03)	0.109*** (-0.03)		0.127*** (-0.031)	0.127*** (-0.031)		0.114** (-0.045)
<i>ln(Support)</i>		0.171*** (-0.058)	0.177*** (-0.058)		0.202** (-0.083)	0.202** (-0.083)		0.158** (-0.077)
<i>ln(Gini)</i>	-0.414*** (-0.145)		-0.390*** (-0.132)	0.101 (-0.217)		0.003 (-0.216)	-0.627*** (-0.187)	-0.561*** (-0.162)
<i>ln(EP)</i>	0.5 (-0.346)	0.197 (-0.292)	0.540* (-0.317)	-0.204 (-0.391)	-0.044 (-0.327)	-0.047 (-0.378)	1.239** (-0.567)	1.130* (-0.603)
Constant	0.757 (-0.815)	1.594 (-1.427)	2.999* (-1.555)	-1.6 (-1.236)	0.119 (-1.692)	0.103 (-1.998)	1.942* (-1.088)	1.804 (-1.995)
Observations	1,065	1,045	1,045	523	515	515	542	530
R-squared	0.124	0.179	0.191	0.18	0.269	0.269	0.124	0.164
Number of countries	134	134	134	66	66	66	75	75

NOTE: The regressions are controlled for country and year dummies. Clustered standard errors by country are reported in parentheses. ***, **, and * denote estimates, which are statistically significant at the 1 percent, 5 percent, and 10 percent levels, respectively. Dependent variable is *ln(Happiness)*.

happiness of people in societies with relatively low inequality level are not significantly affected by inequality, redistribution policy is also not a statistically significant factor for subjective well-being. From another perspective, these results can be interpreted that, in relatively equal societies, stronger redistribution policies do not necessarily lower satisfaction levels. On the other hand, in the high Gini group, EP has strong positive coefficient of 1.239 in column (7). Income equality also has strong negative coefficient of 0.627 at the 1 percent level. When other variables are controlled except for income inequality, EP still has positive coefficient of 1.130, albeit at the 10 percent level. In column (9), after controlling Gini, EP still has strong positive coefficient of 1.290 at the 5 percent level. It is interesting to note that in columns (7) and (9), coefficient for EP increased from 1.239 to 1.290, even after controlling more variables. We can cautiously suggest that other variables such as life expectancy, freedom, and social support lack in explaining for the increase in subjective well-being as a result of the government's redistributive policy. Overall, the results show that that redistributive policies count significantly toward happiness in more unequal countries.

According to the Kuznets curve, during initial economic development, income inequality deteriorates at first and then gradually improves as economic development continues, thus, creating an inverted U curve between income per capita and inequality (Kuznets, 1955). Naturally, many developed countries tend to have lower income inequality than most developing countries. This disparity in overall income is also represented by the difference in the average Gini index between the developed and developing countries, which is 30.76 and 40.25, respectively, as shown in Tables 2 and 3, revealing a wide gap. The corresponding high Gini groups in Tables 4 and 5 consist mostly of developing countries, while almost all the countries in the low Gini group are developed. Therefore, we tried to find out whether income inequality also has a significant impact on the high Gini group because the group consists of more developing countries with lower income per capita than the low Gini group. Thus, we divided the countries into developed and developing to determine whether the difference in the inequality coefficient between the high and low Gini groups arises from income level. Both developed and developing countries' groups were again divided into subgroups with high and low inequality based on the median Gini index for each group.

Table 6 shows the results of the fixed effect model for 35 developed countries. The median Gini is 30.6 for the developed countries, much lower than the median Gini of all countries, which is 36.7. In column (2) of the full sample, neither inequality nor EP has a significant effect on country-level happiness. GDP per capita, freedom, and social support each carry coefficients of 0.306, 0.118, and 0.498 at the 1 percent significance level.

In the high Gini group of developed countries, income inequality has a strong negative coefficient of 0.647 at the 5 percent level. This result is consistent with the previous finding that high income inequality decreases the subjective well-being of people. At this point, we have to keep in mind that the median Gini is only 30.6, much lower than that of full sample as well as that of the developing countries group, as the division is solely within the developed countries. Yet, when both Gini and EP are controlled as independent variables in column (6), the two variables become insignificant possibly due to the strong correlation between them.

It is also interesting to look into the results of column (4) of the low Gini group. When only inequality is considered in column (4), Gini remains an insignificant factor for happiness. However, in column (5), when both inequality and EP are controlled, Gini has a negative coefficient of -0.477 , at the 10 percent level. This result implies that even

TABLE 6
Estimation Results for Developed Countries

Variable	Dependent Variable: <i>ln(Happiness)</i>					
	Full Sample		Low Gini (<i>Gini</i> ≤ 30.6)		High Gini (<i>Gini</i> > 30.6)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>ln(GDPPC)</i>	0.311*** (0.065)	0.306*** (0.068)	0.169 (0.123)	0.203 (0.123)	0.443*** (0.060)	0.425*** (0.087)
<i>ln(Life_Exp)</i>	0.768 (0.559)	0.796 (0.558)	0.598 (0.689)	0.446 (0.731)	1.761*** (0.791)	1.825** (0.772)
<i>ln(Freedom)</i>	0.118*** (0.041)	0.118*** (0.040)	0.315*** (0.077)	0.308*** (0.077)	0.033 (0.051)	0.034 (0.050)
<i>ln(Support)</i>	0.498*** (0.146)	0.498*** (0.148)	0.440*** (0.107)	0.405*** (0.101)	0.496** (0.224)	0.488* (0.242)
<i>ln(Gini)</i>	-0.301 (0.179)	-0.266 (0.215)	-0.227 (0.202)	-0.477* (0.244)	-0.647** (0.289)	-0.532 (0.455)
<i>ln(EP)</i>		-0.097 (0.315)		0.730 (0.495)		-0.265 (0.539)
Constant	-3.648* (2.107)	-3.805* (2.116)	-1.601 (2.520)	-0.728 (2.871)	-8.095** (3.029)	-8.522** (3.005)
Observations	323	323	159	159	164	164
R-squared	0.437	0.437	0.504	0.516	0.502	0.504
Number of countries	35	35	20	20	18	18

NOTE: The regressions are controlled for country and year dummies. Clustered standard errors by country are reported in parentheses. ***, **, and * denote estimates, which are statistically significant at the 1 percent, 5 percent, and 10 percent levels, respectively. Dependent variable is *ln(Happiness)*.

among developed countries with low income inequality, given that there is a similar degree of redistributive policies, higher inequality contributes negatively to subjective well-being.

Table 7 represents the results for 99 developing countries. Based on the median value of 40.5 in the sample of developing countries, the sample is further classified into a high Gini group and low Gini group. The median Gini is significantly higher than that of the developed countries as well as that of all countries. In the full sample of Table 7, the coefficients of both income inequality and EP are significant. In column (1), without controlling EP, the coefficient of income inequality is -0.414 at the 5 percent significance level. In column (2), the coefficient of income inequality (-0.495) is still negative and significant at the 1 percent level. Simultaneously, the coefficient of EP (1.260) is positive and significant at the 1 percent level.

However, in the results for the low Gini group represented in columns (3) and (4), the coefficients for Gini and EP become insignificant. This is somewhat surprising, given that the median value of Gini in developing countries is much higher than that of the full sample. Even when their income inequality is only *relatively* better than that of the other developing countries, neither income inequality nor EP has a significant impact on subjective well-being. On the contrary, the results from the high Gini group in columns (5) and (6) indicate that both the income inequality and the income redistributive policy are significant determinants for life satisfaction. The coefficients of Gini are estimated to be -0.684 in column (5) and -0.631 in column (6), which are both significant at the 1 percent level. In column (6), EP has a strong coefficient of 1.951 , which is also robust at the 1 percent level.

The subsample analyses in Tables 6 and 7 suggest that it is the relative inequality rather than the absolute income level that determines the significance of income inequality and redistribution policies on country-level happiness. Even in the high-income group, if their inequality level is higher than that of other developed countries, income inequality matters for subjective well-being. However, even in the low-income group, if their inequality level is lower than that of other developing countries, income inequality is not an important factor for life satisfaction. Considering that developed countries generally employ stronger income redistribution policies and their resulting income inequality is much lower than that of developing countries, we can say that the people in developed countries expect a relatively more equal income distribution.

These results suggest that *relativity* plays a role in determining the subjective well-being of people. According to the social comparison theory of Festinger (1954), people evaluate themselves through a comparison with their peers. Since the introduction of the theory, there have been various empirical studies in varying fields including, happiness studies, experimental economics, and sociopsychological studies, which corroborate the argument that people are conscious about their relative standing vis-à-vis others (Myers and Diener 1996; Fehr and Schmidt, 1999; Knell, 1999). In addition, people are more prone to make upward-oriented social comparisons with those who are of a similar or higher social status (Schor, 1998).

In the countries with high income inequality, wealth is held by a few rich people. Under this circumstance, there is a higher likelihood that an upward social comparison will lead to the majority of population feeling relatively deprived, thus, negatively affecting the subjective well-being. This upward orientation can explain why the subjective well-being of people in developed countries with a higher absolute level of income can still be significantly lowered by income inequality. In other words, as the level of income increases, the respective reference norms for assessing economic equality also increases. Thus, people expect a higher level of equality in their societies as the GDP increases. Furthermore, it is

TABLE 7
Estimation Results for Developing Countries

Variable	Dependent Variable: <i>ln(Happiness)</i>					
	Full Sample		Low Gini (<i>Gini</i> ≤ 40.5)		High Gini (<i>Gini</i> > 40.5)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>ln(GDPPC)</i>	0.208** (0.076)	0.211*** (0.074)	0.219** (0.108)	0.218** (0.107)	0.233* (0.121)	0.232* (0.120)
<i>ln(Life_Exp)</i>	-0.522 (0.366)	-0.465 (0.357)	-0.219 (0.749)	-0.177 (0.740)	-0.402 (0.387)	-0.359 (0.375)
<i>ln(Freedom)</i>	0.110*** (0.037)	0.103*** (0.036)	0.047 (0.033)	0.048 (0.033)	0.194*** (0.058)	0.181*** (0.060)
<i>ln(Support)</i>	0.165*** (0.060)	0.170*** (0.061)	0.241*** (0.071)	0.247*** (0.072)	0.097 (0.095)	0.098 (0.096)
<i>ln(Gini)</i>	-0.414** (0.159)	-0.497*** (0.169)	0.004 (0.275)	-0.136 (0.367)	-0.684*** (0.208)	-0.631*** (0.194)
<i>ln(EP)</i>		1.260*** (0.454)		0.861 (0.947)		1.951*** (0.716)
Constant	3.457* (1.852)	3.366* (1.807)	0.535 (3.825)	0.741 (3.888)	3.851* (2.245)	3.344 (2.147)
Observations	722	722	348	348	374	374
R-squared	0.166	0.177	0.163	0.168	0.206	0.222
Number of countries	99	99	56	56	55	55

NOTE: The regressions are controlled for country and year dummies. Clustered standard errors by country are reported in parentheses. ***, **, and * denote estimates, which are statistically significant at the 1 percent, 5 percent, and 10 percent levels, respectively. Dependent variable is *ln(Happiness)*.

important to note that the high Gini subgroups of both developed and developing countries had significant positive coefficients for EP, reaffirming the idea that countries with high inequality need effective redistribution policies to boost happiness levels.

Conclusion

While there are several studies on the effect of income inequality on subjective well-being, this study is the first to examine the impact of EP on subjective well-being. This study finds that in countries with high inequality, income inequality has a negative impact on subjective well-being and income redistribution increases the country-level subjective well-being. In this sense, this study investigates the significance of macroeconomic policies on a country's happiness levels through a cross-country analysis.

This macro-level study investigated 35 developed countries and 99 developing countries using the comprehensive happiness data of 134 countries. Previous studies on the effect of income inequality on happiness have largely focused on developed countries. Alesina, Di Tella, and MacCulloch (2004) focused on the United States and Europe. Oishi, Kesebir, and Diener (2011) examined the inequality in the United States. Graham and Felton (2006) focused on developing countries but limited themselves to Latin American countries. As this study uses data from 134 countries, it paints a more accurate picture of the effect of inequality on happiness for the entire sample as well as for developed and developing countries.

Furthermore, we find that the standard for equality or people's general expectation of equality increases alongside a rise in income. Even in developed countries whose inequality level is lower than most developing countries, if the country has a relatively higher Gini than other developed countries, inequality significantly diminishes happiness level. Thus, we can say that, as income increases, the reference norms also increase, leading people to set higher standards of equality. Another takeaway is that, contrary to common belief, there is no absolute standard that guarantees that income positively affects happiness. Rather, income affects subjective well-being through a comparison with other countries.

Lastly, we can give a clear answer to the question of whether income (re)distribution matters for subjective well-being. It depends significantly on the relative inequality of the country, regardless of whether it is developed or developing. For relatively equal countries, redistribution policies do not increase happiness levels. Nevertheless, for more unequal countries in both developing and developed countries, redistributive policies most significantly increase subjective well-being.

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Appendix

List of Developed Countries (35 countries)

Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and the United States.