

Will A Nation Be Happier With A More Even Income Distribution?

**A QMSS Program Thesis on Income Distribution and
National Subjective Well-Being**

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1. Introduction

Although the discussion of happiness can be traced back to Aristotle's Rhetoric, much emphasis had been placed on the negative forms of emotions such as anxiety, depression and various other mental illnesses¹. Subjective well-being (SWB) as an indicator of the positive emotions is a relatively new field. Hitherto it has attracted an increasing attention in recent years. Whether money buys happiness has long been an intriguing question for many people. Plenty previous research has shed light on the relationship between income and SWB at both individual and national levels. Yet not as much in-depth research has focused on the effect of income distribution on national aggregate SWB and whether the effects are similar between rich and poor nations.

As we know, there has always been a debate on policies regarding economic equality versus efficiency. Studying the relationship between SWB and income distribution could provide a fresh angle of looking at this question and add valuable thoughts for policy making. With this in mind, this article will pursue further evidence to answer this question. The dependent variable will be the national aggregate SWB² and the key independent variable will be income and income distribution.

2. The Definition and Measurement of Subject Well-being

¹ As Helliwell (2002) put it, "One count places the number of psychological abstracts since 1887 mentioning anxiety as 100 times greater than those mentioning life satisfactions."

² The national aggregate measure denotes the mean SWB of the nation.

Ed Diener, a leading researcher in this field, as well as his coauthors, defined SWB as the cognitive and affective evaluations of life. It contains three primary components: life satisfaction, pleasant affect, and low levels of unpleasant affect (Diener, Suh, & Oishi, 1997). Pleasant affect and unpleasant affect describe a relatively short-term evaluation of SWB, while life satisfaction pertains to a long-term and retrospective evaluation of well-being. Life satisfaction would be the interest for the purpose of this article because the concern is how income distribution interacts with people's global evaluation of their life rather than their momentary judgments.

SWB is typically measured through a self-reported survey asking questions regarding the three components. Some commonly used scales for measuring SWB are the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffith, 1985), the Positive Affect and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), and the Psychological Well-Being Scale (PWB; Ryff, 1989). Affect items in the Satisfaction With Life Scale include questions such as "In most ways my life is close to my ideal" and "So far I have gotten the important things I want in life". The study of Pavot and Diener (1993) shows that all three scales successfully represent psychometric properties.

However, there are concerns expressed about the potential bias of the self-report measure. Generally speaking, the design of the questionnaire, the subjects' tendency to answer questions in a socially accepted manner, the momentary mood of the subject during the time of encountering, and the suffering of losing memory could all pose threats to the validity of the answers. For example, Schwarz and Strack (1999) found that ordering of items, mood and

other situational factors can influence the results. Diener (2000) suggested using a combination of other types of measures with one-time scales. One example is the Experience-Sampling Method (ESM), which collects subject's assessment of SWB at random moments over a period of one to four weeks. Due to the difficulty and high cost of multi-measures, current national data on SWB is mostly based on single-occasion self-reports such as used by the World Values Survey. It is not without problems as aforementioned, but it does assess SWB with a degree of validity.

3. Literature Review

Income and SWB

Before discussing income distribution, one basic question is how income itself affects people's long-term SWB level. We hear the expression that "Money does not buy happiness", usually through the mouth of the rich, but we also hear that "Those who say money does not buy happiness don't know where to shop." Scientific research found both claims as meaningful insights. In short, research findings show that although income or wealth does not explain a huge portion of long-term SWB at an individual level, it does bring a positive contribution. Moreover, the contributing effect is found to diminish as income increases.

Maslow's (1954) pyramid sketched out human demands from physiological and safety needs to self-actualization and transcendence. People first try to satisfy their basic needs, and then go up the ladder for higher levels of pursuits. Previous studies proved that there is a positive correlation between fulfilling needs and goals and the gaining of SWB (e.g. Diener, 1984;

Carver & Scheier 1990; Brunstein 1993). Income undoubtedly plays a role as the means of acquiring those needs, especially the basic material needs such as food, clothing and shelter. In pursuing higher level of needs in terms of social interaction and self-worth, income starts to take a less direct role. For example, money does not automatically make a rich person philanthropist, but with generous donation via money, the person will turn into a philanthropist and win more social recognition.

The adaptation theory is also a widely referenced theory in explaining SWB. It states that people tend to adapt to their life circumstances when basic needs are not threatened even if they react strongly to life changes at the beginning. It suggests a long-term SWB baseline where people bounce back and forth from by going through an adaptation process (Headey & Wearing 1989). And the baseline is largely determined by one's temperament. This supports the fact that demographic variables such as age, sex, race, education, geographic location as well as income only have weak correlations with SWB at an individual level (Diener, Suh & Oishi 1997). Nevertheless, adaptation is not without limitation. People may not adapt completely to adverse situations when their basic life needs are not satisfied.

Many researchers (e.g. Veenhoven 1991, Diener, Diener & Diener 1995, Myers 1996, and Diener and Biswas-Diener 2001) presented consistent findings mirroring income's diminishing effect on SWB as well as the adaptation theory. Some important ones are:

- (1) Economic growth in developed nations in recent decades did not cause significant SWB increase within the nation.

(2) The correlation between income and SWB was larger in poor nations than in rich nations.

(3) The correlation between the wealth of nations and the mean SWB appeared to be large. This explains the fact that developing nations with a considerable population of people suffering from hunger, disease and oppression were found to have much lower national SWB. It suggests that at a national level, income is a crucial factor for its aggregate SWB in spite of the adaptation process.

(4) The correlation between income and SWB beyond the fulfillment of basic needs at a national level was also examined. The results show that with the control of basic need fulfillment, the correlation remained significant even though the degree of the effect was reduced.

Robert A. Cummins (2000) conducted an elegant research based on the Homeostatic Theory of Subject Well-being. The conclusion states that “money buys happiness to the extent that external resources permit other optimal functioning of the SWB homeostatic system.” The Homeostatic Theory of SWB agrees that temperament is the determinant factor of SWB, and it defines a narrow range within which SWB varies. Upon that, experiences with environment also influence SWB, but the effect is adjusted by both internal factors (i.e. perceived control, self-esteem, and optimism) and external factors (i.e. any resources that can offset negative impact of life events). Money is universally agreed to be a powerful external resource. In that sense it can alter individual SWB levels to a certain extent. Cummins also argued that income’s diminishing effect on SWB may be due to its indirect contribution for higher levels of needs.

Income distribution and SWB

When it comes to the relationship between income distribution and SWB, the most referenced theoretical framework is social comparison. It states that SWB level depends on one's relative position to variable standards within one's social context (Diener, Diener & Diener, 1995).

Psychologically speaking, comparing other people's well-being to ourselves can alter our sense of accomplishments and thus affect our evaluation of SWB. One's SWB level declines when his/her income level is perceived as below the average income of the community and vice versa. Most researchers do recognize the existence of social comparison as an influence on one's SWB. Yet there is no consensus on its significance. While some find relative income poses strong effect on SWB, others do not find notable evidence at all.

Diener, Sandvik, Seidlitz and Diener (1993) found that living in either richer or poorer communities did not result in an obviously different SWB level for those who make similar incomes. They argued that social comparison does not work in an automatic way. Rather, people select whom to compare with within a "coping model of social comparison".

Fujita(1993) studied how one's friends and roommates influence one's SWB level on certain important characteristics, and did not detect notable social comparison effect in this case.

Diener, Diener and Diener (1995) tested three social comparison contexts: (1) How wealthier or poorer neighboring nations affect the SWB of one nation; (2) How income skew within a nation affects its SWB; (3) How income standard deviation within a nation affects the standard deviation of its SWB. The results from all three tests demonstrated no evidence of income social comparison.

On the other hand, a number of other laboratory and natural setting tests presented the opposite findings. For example, Smith, Diener and Wedell(1989)'s experiment on 158 college students tested Parducci (1984)'s range-frequency model and yielded a positive result on the effect of social comparison on SWB. Stutzer (2003) examined data obtained from interviews with 6000 households in Switzerland and found that income aspiration increased with the average income level in their communities, and the higher the income aspiration, the lower the reported SWB level. Similar results were obtained in Clark and Oswald (1995)'s study of 5000 British workers. The workers' reported SWB levels were found to be inversely related to their comparison wage rates. In the study of two emerging markets, Peru and Russia, Graham and Pettinato (2002) suggested that relative income rather than absolute income had more weight on self-assessment of satisfaction.

However, there are very limited articles focusing on the relationship between income distribution and national aggregate SWB. As aforementioned, one of the three social comparison studies conducted by Diener, Diener and Diener (1995) addressed this issue and returned an insignificant result of income social comparison. Later, Hagerty (2000) examined the question further by adopting Parducci's (1968,1995) range-frequency theory and refining the methods used by Diener et al (1995). His findings, on the other hand, provided significant evidence on the negative correlation between income skew and national aggregate SWB.

Insofar, no other articles were found to address this issue specifically.

The range-frequency theory was referenced in both Diener et al (1995) and Hagerty (2000)' studies. Partucci (1968) developed the theory from a laboratory experiment in finding out how people compare themselves to others. It states that people not only compare their income to the richest and poorest people, but also rank themselves in the income range of all people.

This can be expressed in the following equations:

$$(1) SWB_i = wR_i + (1-w)F_i,$$

$$(2) R_i = (I_i - \min) / (\max - \min),$$

$$(3) F_i = \text{Rank}_i / N.$$

Equation (1) predicts that the SWB level of an individual i is a weighted sum of a range principle (R) and a frequency principle (F). Equation (2) denotes that the range principle (R) relies on the ratio of the excess amount of one's own income over the minimum income and the range between the maximum and the minimum income in the social context. Equation (3) denotes the frequency principle, which can be regarded as the income percentile that the individual lies in among the whole distribution of income. N is the size of the distribution, and Rank goes from 1 to N , indicating the positions of the lowest and highest income, respectively.

Some valuable predictions relevant to income distribution can be inferred from the above equations (Partucci, 1995):

1. The range principle indicates an inverse relationship between the maximum income and an individual's SWB since the minimum income has a bottom of zero and usually does not vary much from there even in developed nations.
2. Individual SWB increases as the skew of the distribution increases³ given the same individual income level. This is because more people will be ranked under any given income i , and hence causes the frequency principle (F) to be higher. For example, an individual ranked 100th with an income of \$30,000 before will be ranked 120th with the same income if the skew of distribution increases to a more positive extent.
3. Aggregate SWB of the nation decreases as the skew of the distribution increases. This prediction is resulted from a different angle than in the last case of an individual. The sum of the range principle in equation(1) will decrease as more people are near the bottom of the income level, while the frequency principle remain the same given the same size of the population. In other words, a more skewed income distribution means more people are poor, and the national aggregate SWB is lower in spite of the fact that fewer people gains from the skew.

Parducci's predictions apparently support the social comparison effect on SWB, and the third prediction claims an inverse relationship between aggregate SWB and the inequality distribution of income. In the study of Diener et al (1995), 55 nations were examined through four surveys. Although income skew and Gini coefficient⁴ were inversely correlated to

³ Income distribution within a nation usually is in the form of a positive skew, i.e. more people will be ranked under the average income and results in an upper tail on the left and a lower tail on the right.

⁴ It is measure of income equality, with 0 representing a perfect equality and 1 representing a maximal inequality.

national SWB, only one out of eight coefficients⁵ were statistically significant. Hagerty (2000) examined time series data of eight industrial countries over 25 years and tested the effects of income skew, Gini coefficient as well as percentages of national income received by the households in the highest and lowest income quintile. His results confirmed the third prediction induced from the range-frequency theory. All income distribution variables except the percentage of national income from the lowest income quintile were found to affect national SWB in a negative way, and also statistically significant. Clearly, previous research findings on income distribution and national SWB are not conclusive because they are both limited and contradictory.

4. Research Design

As aforementioned, the main concern of this article is to find out whether a more skewed income distribution reduces aggregate SWB at a national level. Another major interest is to find out whether income distribution generates different effects on SWB between rich and poor nations. The dependent variable will be the national aggregate SWB, and the key independent variables will be income level and a few income distribution variables. National aggregate SWB is usually represented by the mean SWB of the nation calculated by taking the average of all survey population. Income distribution should ideally include variables describing both income skew and income dispersion. The strategy is to compose more measures of income distribution based on available data. Previously, income skew is usually

⁵ Four regressions were run against four surveys on both Gini coefficient and income skew.

computed based on income quintile data⁶. Another alternative is to use the ratio of mean income over median income if median income data is available. Gini coefficient is a traditionally well accepted measure of income equality, which is also a reasonable proxy for income skew. Income dispersion data may be hard to obtain. Hagerty (2000) proposed the idea but did not include it in this study because it was unavailable.

There are a number of other factors that were found to have influence on national SWB (Diener, Diener and Diener, 1995):

(1) *National Wealth*. As reviewed earlier, the correlation between the wealth of nations and the mean SWB was found to be large. GDP per capita or GNP⁷ per capita when GDP is not available, can be used to as the measure.

(2) *Human Rights*. Whether people have sufficient civil and political rights to pursue their life goals is regarded as an important factor affecting the national SWB.

Empirical evidence shows that national SWB tends to be lower when people are under oppression and lack of liberty. Information and indicators of human rights can be gathered from various reports.

(3) *Income Growth*. A too rapid or too static growth rate could both drive national SWB down. Diener et al. (1993) found that rapid economic growth is likely to cause high aspiration and more turbulence in life such as job dislocation, and hence lower SWB level. Nonetheless, a static growth rate or no growth could cause unemployment rate to rise, and also affect SWB in a negative way. Therefore, income growth does not seem to have a relationship with SWB in a definite direction.

⁶ This is the measure used by Diener et al (1995).

⁷ GNP stands for gross national product.

(4) *Equality*. Equality in major life aspects such as life expectation, health care, education and income could help increase people's chance of attaining life goals. On the other hand, inequality often results in more people being suppressed in accessing useful resources and thus lowers their SWB level. Income equality will be measured and tested by Gini coefficient. Other equality factors are also measurable but may not be available to a wide range of nations.

(5) *Cultural Aspects*. Whether a society values individualism or collectivism (I-C; Triandis, 1989), or whether it is more culturally homogeneous or heterogeneous were found to affect people's perception of happiness. However, it is hard to gauge where those aspects drive national SWB and to what degree the influence can reach.

Diener et al. (1995) tested most of the above factors together with income distribution on a total of 55 nations. Among the 55 nations, European countries were overrepresented, while extremely poor countries were underrepresented. In addition, testing all variables limited the data observations because some factors were rarely measured for a great number of countries. Hagerty (2000) only included eight developed nations⁸, but introduced time series data. There were no controls placed, probably due to the similarity among those nations. Apparently, results from this study only explain the matter well for the richest nations in the world, but they cannot be applied to the rest of the worlds with a large number of poorer nations.

This proposal will attempt a design with controlled national income factor in testing the relationship between income distribution and aggregate SWB. Nations will be divided into

⁸ The eight nations are the United States, United Kingdom, Netherlands, France, Germany, Italy, Denmark and Japan.

groups based on income, covering developed nations, developing nations and extremely poor nations, where they should be equally represented as much as possible. This will result in testing the model at least four times⁹, one of which is against all the nations, and the rest will be for different nation groups. This design would help to provide a more thorough understanding on the interaction between income distribution and national aggregate SWB. In addition, a comparison of different nation groups could generate some interesting findings because they vary considerably in national income as well as many other factors.

Income itself will be tested together with income distribution variables, i.e. Gini coefficient, income skew based on quintiles or deciles and possibly income dispersion¹⁰. Per capita income was proven to have a large positive effect on national SWB, and the data is fairly available for many countries. Moreover, comparing its effect among the nation groups can provide valuable insights on the previously proposed diminishing effect of absolute income.

Other aforementioned factors will be controlled when necessary. Factors like cultural aspects are hard to measure, but relatively convenient to be categorized based on region and religion. Human rights and equality data are measurable yet not available to a great number of nations, especially to developing and extremely poor nations. Income growth does not seem to bear a definite one-direction relationship with SWB and is not the focus of the research. Therefore, they will not be tested directly. The control on income level and cultural factors can help reduce their confounding effects.

⁹ There may be further break-down under developing countries due to the wide varieties among them.

¹⁰ Income dispersion may be attempted depending on data availability.

There is no definite hypothesis suggesting the significance of income distribution's effect on national aggregate SWB, although it is logical to assume they move in an opposite direction. Previously reviewed theories, empirical evidence as well as research findings did not agree with each other. Nonetheless, it is an important question regarding economic equality and well-being. The results from this proposal can add to its implication and shed light on social and economic policy making.

5. Data Analysis

Data Collection

National aggregate SWB as the dependent variable is collected from the World Database of Happiness directed by Ruut Veenhoven. This database collected happiness surveys for 110 countries from 1945 to 2007. What was used in this study includes 89 countries¹¹, average subject well-beings from 1995 to 2005. Among them, 31 are mostly OECD countries, and the rest 58 covers the second- and third-world countries, many of which have not been studied closely on the subject of subject well-being previously. The variable of national mean subject well-being reflects the "overall appreciation of his own life as-a-whole". It is expressed in a scale from 0 to 10 with 0 representing the lowest level and 10 the highest. The following table listed them in the order of descending SWB value with the number of surveys conducted during the time span.

¹¹ Or regional economy of a country, such as Taiwan of China.

Table 1

Country	National Aggregate Subject Well-being	Rank	Number of Survey
Denmark	8.2	1	3
Colombia	8.1	2	2
Switzerland	8.1	3	3
Austria	8	4	5
Australia	7.7	5	14
Finland	7.7	6	4
Sweden	7.7	7	6
Canada	7.6	8	1
Guatemala	7.6	9	1
Ireland	7.6	10	3
Luxembourg	7.6	11	3
Mexico	7.6	12	2
Norway	7.6	13	2
Malta	7.5	14	2
Netherlands	7.5	15	3
United States	7.4	16	2
Belgium	7.3	17	3
El Salvador	7.2	18	1
Germany	7.2	19	7
New Zealand	7.2	20	2
United Kingdom	7.1	21	5
Honduras	7.1	22	1
Cyprus	6.9	23	1
Italy	6.9	24	3
Spain	6.9	25	5
Argentina	6.8	26	2
Brazil	6.8	27	1
Dominican Republic	6.8	28	1
Singapore	6.8	29	1
Venezuela	6.8	30	2
Chile	6.7	31	2
Israel	6.7	32	2
Slovenia	6.7	33	5
Uruguay	6.7	34	1
Indonesia	6.6	35	1
France	6.5	36	6
Czech Republic	6.4	37	3
Greece	6.4	38	3
Nigeria	6.4	39	2
Philippines	6.4	40	2
China	6.3	41	2
India	6.2	42	1
Japan	6.2	43	2
Taiwan, China	6.2	44	1

Uzbekistan	6.2	45	1
Kyrgyz Republic	6.1	46	1
Viet Nam	6.1	47	1
Iran	6	48	1
Peru	6	49	2
Portugal	6	50	3
Croatia	5.9	51	2
Poland	5.9	52	4
Bolivia	5.8	53	1
Korea, Republic of	5.8	54	1
Bangladesh	5.7	55	2
Senegal	5.7	56	1
Hungary	5.6	57	8
Morocco	5.6	58	1
Slovak Republic	5.5	59	3
South Africa	5.5	60	3
Lebanon	5.3	61	1
Algeria	5.2	62	1
Jordan	5.2	63	1
Kenya	5.2	64	1
Turkey	5.2	65	4
Bosnia and Herzegovina	5.1	66	2
Estonia	5.1	67	3
Serbia and Montenegro	5.1	68	2
Uganda	5.1	69	1
Romania	5	70	4
Azerbaijan	4.9	71	1
Macedonia, FYR	4.9	72	2
Egypt	4.8	73	1
Ghana	4.8	74	1
Iraq	4.7	75	1
Latvia	4.7	76	3
Lithuania	4.6	77	3
Albania	4.4	78	2
Angola	4.4	79	1
Russian Federation	4.4	80	13
Pakistan	4.3	81	1
Bulgaria	4.2	82	3
Georgia	4.1	83	1
Belarus	4	84	2
Armenia	3.7	85	1
Ukraine	3.6	86	2
Moldova	3.5	87	2
Zimbabwe	3.3	88	1
Tanzania	3.2	89	1

The independent variables include measures on level of income and income distribution within nations. I used World Bank's GNI per capita as the measure of level of national income instead of the commonly used GDP per capita. The advantage of using GNI measure versus GDP is that it uses a three-year average of exchange rates to smooth out the transitory exchange rate fluctuations while converting from each national currency to current US dollars¹². GDP per capita, on the other hand, are calculated from data in constant prices and national currency units, which is subject to distortion from short-term currency conversion fluctuations. Also, the nation classification step, which will be discussed later, is also based on World Bank's GNI per capita measure for consistency. Therefore, using GNI per capita renders a more solid base for comparing the relative income level of economies.

To measure income distribution, three variables are collected or calculated. Gini coefficient is widely accepted as the measure of income inequality and the data is available for most countries. However, the coefficient is sensitive to any changes in the income distribution, whether it is at the top, bottom or middle. Hence it doesn't necessarily reflect the whole picture of income skew and dispersion within a nation. Income skew is not reported, but can be estimated based on quintile data, which are also available to most nations. Income range data are not available, but a decile dispersion ratio is used to capture at least a rough picture of income dispersion. The ratio is calculated as the average income of the top 10 percent of population divided by that of the bottom 10 percent of population. It represents the income of

¹² This is referred to as the Atlas method by World Bank.

the rich as multiples of that of the poor. All raw data are from the UNU-WIDER World Income Inequality Database¹³.

Method

The focus of the analyses is on how income inequality will affect national aggregate SWB. As aforementioned, nations vary tremendously in their income, and at different income levels the within nation income distribution could render different effects. For example, in extremely poor nations, when a large population's basic life needs are not satisfied, the income inequality is less relevant to its national aggregate SWB than the income level because people may not adapt to adverse living conditions completely. Therefore, the income level control will be placed first.

To divide the nations, World Bank's classification¹⁴ is adopted. The 89 nations are grouped into four categories based on the gross national income (GNI) per capita¹⁵. There are 14 nations in the low income bracket, 25 in the lower medium income bracket, 19 in the upper medium income bracket and 31 in the high income bracket. Table 2 lays out the four groups of nations. The 31 high income nations are good representation of the developed world, and stand for over 50% of all 60 high income nations. The upper medium income nations represent 46% of a total of 41 nations. The lower medium income nations listed also represent

¹³ As the introduction of the website discribes: "WIID2 consists of a checked and corrected WIID1, a new update of the Deininger & Squire database from the World Bank, new estimates from the Luxembourg Income Study and Transmonee, and other new sources as they have become available".

¹⁴ World Bank member economies with populations of more than 30,000 are divided into income groups according to 2006 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, \$905 or less; lower middle income, \$906–3,595; upper middle income, \$3,596–11,115; and high income, \$11,116 or more.

¹⁵ Using World Bank's GNI measure for income level as well as its nation classification based on the same variable helps maintain the consistency in nation-level comparison.

a good portion of 45% of all 55 nations, however, the low income nations only represents 26% of all 53 nations in this category due to data unavailability.

Table 2

Low income Nations (14)	Lower medium income Nations (25)	Upper medium income Nations (19)	High income Nations (31)
Bangladesh	Albania	Argentina	Australia
Ghana	Algeria	Brazil	Austria
India	Armenia	Bulgaria	Belgium
Kenya	Azerbaijan	Chile	Canada
Kyrgyz Repu	Belarus	Croatia	Cyprus
Mali	Bolivia	Hungary	Czech Republic
Nigeria	Bosnia and Herzegovina	Latvia	Denmark
Pakistan	China	Lebanon	Estonia
Senegal	Colombia	Lithuania	Finland
Tanzania	Dominican Republic	Mexico	France
Uganda	Egypt	Poland	Germany
Uzbekistan	El Salvador	Romania	Greece
Viet Nam	Georgia	Russian Federation	Ireland
Zimbabwe	Guatemala	Serbia and Montenegro	Israel
	Honduras	Slovak Republic	Italy
	Indonesia	South Africa	Japan
	Iran	Turkey	Korea, Republic of
	Iraq	Uruguay	Luxembourg
	Jordan	Venezuela	Malta
	Macedonia, FYR		Netherlands
	Moldova		New Zealand
	Morocco		Norway
	Peru		Portugal
	Philippines		Singapore
	Ukraine		Slovenia
			Spain
			Sweden
			Switzerland
			Taiwan, China
			United Kingdom
			United States

To test for the income group effects on national aggregate SWB, a multiple regression is run on dummy variables representing the four nation groups. The results are presented in Table 3. Clearly the high income nations are distinctively different from the other nation groups in explaining the dependent variable. The other three nations do not show significant difference

from each other in their relationship to the dependent variable. In other words, we cannot reject the null hypotheses that the coefficients are zero. However, it is not safe to conclude that the three lower income nations groups would have similar results when tested separately. It only suggests that they may be put together as one to compare with the high income nations group.

Table 3

Base-line Variable	<u>Low income nations</u>		<u>Medium low income nations</u>		<u>Upper high income nations</u>		<u>High income nations</u>	
	T	β	t	β	t	β	t	β
Low income nations			0.82	0.275	1.32	0.471	5.59	1.82***
Medium low income nations					0.64	0.308	5.68	1.544***
Upper high income nations							4.68	1.348***
R^2	0.3656							

Note: n=89. * p<.05. ** p<.01. *** p<0.0001

When testing income distribution's effect on each of nation group, all three income distribution variables: Gini coefficient, income skew and income decile dispersion ratio will be examined in separate single regressions. Meanwhile, to evaluate income level's effect, GNI per capita will be tested in single regressions for all groups as well.

Results

First, GNI per capita is run against national mean SWB for all nations and the sub-groups. The regression results on all nations (in Table 4) show that the national mean SWB is highly correlated to its national income level and explains approximately 42% of the SWB level. The comparison between high income nations and the rest shows that the unit income increment in

poorer nations contributes more to its SWB level than that in the richer nations because the coefficient for poorer nations is four times that of the rich nations. These conclusions are consistent with previous research findings and the theory of diminishing effect of income to SWB. Nonetheless, income level only explains 7% of the SWB for poorer nations, while it explains 45% for high income nations. It suggests that the SWB levels of the not so rich nations are subject to more variables, and a simple analysis of income probably will not explain the more complex scenarios in their cases.

Table 4

Single Regression	<u>All Nations</u>			<u>High income nations</u>			<u>All except High income nations</u>		
	n	t	β	n	t	β	n	t	β
GNI per Capita	89	7.87	0.062***	31	4.91	0.043***	58	2.12	0.169*
R ²	0.416			0.454			0.074		

Note: * p<.05. ** p<.01. *** p<0.0001

The regression on income distribution variables rendered interesting results as displayed in table 5. For all nations together, all three measures show a negative correlation to SWB, but income skew is not statistically significant. Also, income distribution only explains less than 5% of SWB, which is considerably lower than income level itself at about 42%. Therefore, it indicates that the income level of a nation has a much more determinant effect on its SWB level comparing to income distribution, but income inequality does generate a significant negative effect when all nation groups are evaluated together.

Table 5

Single Regression	All nations	Low income nations	Medium low income nations	Upper high income nations	High income nations
Gini Coefficient					4.91
n	89	14	25	19	31
t	-2.06	-1.14	2.59	2.46	-2.24
β	-0.025*	-0.026	0.070*	0.046*	-0.048*
R ²	0.0464	0.0973	0.2264	0.2618	0.1474
Skew					
n	84	14	24	18	28
t	-1.65	-1.52	3.46	2.56	-0.58
β	-0.041	-0.043	0.235*	0.114*	-0.060
R ²	0.0322	0.1609	0.3522	0.2900	0.0128
Decile Dispersion Ratio					
n	79	13	24	18	24
t	-2.06	-2.84	2.89	4.00	0.07
β	-0.005*	-0.004*	0.046**	0.056**	0.003
R ²	0.0524	0.4231	0.2755	0.5006	0.0002

However, when all four sub-groups are evaluated separately on the three income distribution variables, conflicting results appeared. For low-income and high-income nations, most income inequality measures still show a negative correlation with SWB¹⁶ but not all are statistically significant. For low income nations, the decile dispersion ratio has a significant negatively correlation with SWB and explains SWB by a high 42%. This suggests that in the poorest nations, the extreme income gap between the richest and the poorest remarkably influence the nation's aggregate subject well-being. For high income nations, Gini coefficient appears to have noticeable negative influence on SWB with a R² of 14%. As aforementioned, Gini coefficient reflects any change in the income spectrum of the nation, and not particularly the top or the bottom income groups. Hence, it has different implication than the decile dispersion ratio as in the case for low income nations group. Overall, this result favors social

¹⁶ With the exception of decile dispersion ratio for high income nation group.

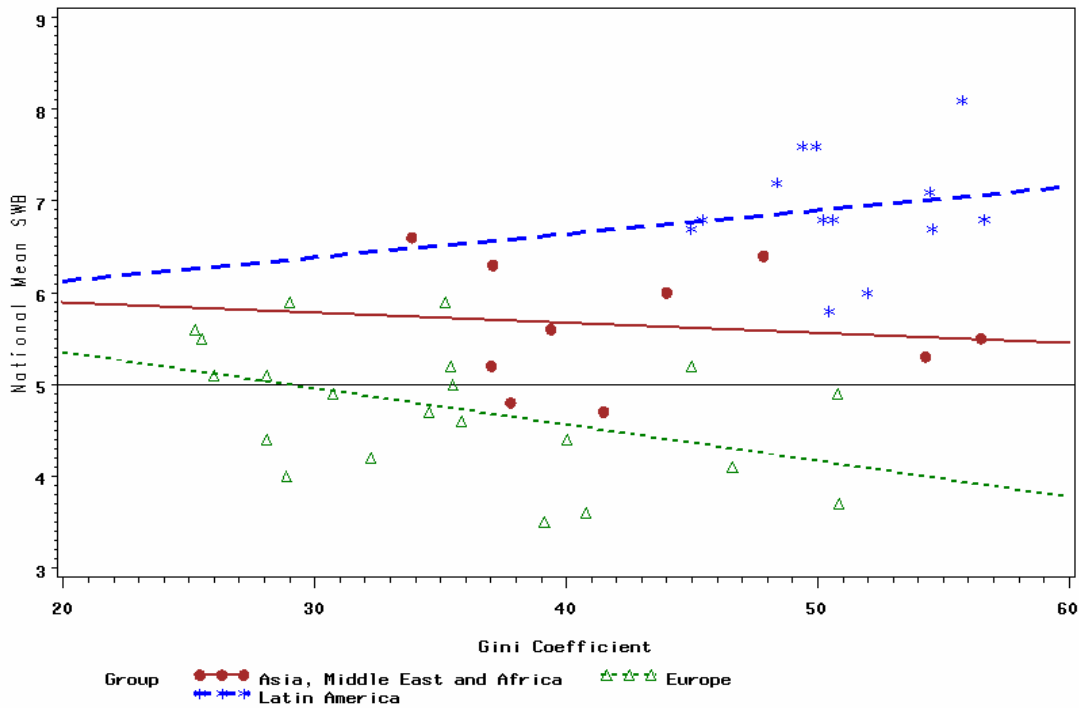
comparison theory. Given that the basic living conditions are met for the majority of the population in high income nations, and inequality issue appears to be more prominent.

For medium-low-income and upper-high-income nations, all three variables are statistically significant but surprisingly in the positive direction, meaning the more of inequality in income the higher the SWB is for the nation. The 44 nations in these two groups basically represent the emerging economies in Latin America, Eastern Europe, East Asia, Middle East and Africa. It is necessary to investigate these regional groups because they are very different in various political, social and cultural aspects. The following graph plotted regression lines of Gini coefficient against national aggregate SWB for the three regional groups¹⁷. Interestingly, the positive correlation between SWB and Gini coefficient is only true to Latin American nations. It is a clear negative correlation for the other two sub-groups. Latin American nations tend to have a very high inequality ratio, with over half of them having a Gini coefficient above .50. Meanwhile, they also tend to report very high life satisfaction, with most of them reporting an average of SWB above 6 from the scale 0 to 10. To gain more understanding of the surprising positive correlation between SWB and income inequality in this region, more factors regarding political environment, culture and religion must be taken into account.

Graph 1

¹⁷ Asian, Middle East and South Africa is combined into one group because of the small number of nations representing each region.

Emerging Markets: Gini Coefficient



With the fact that nations when controlled for income level deliver different results on the correlations between SWB and income distribution, it suggests that there is no single answer to this question. Among the large number of nations with medium-level income, the situation is even more complex. Therefore, even though over all nations SWB is found to be negatively correlated with inequality, it does not automatically apply to all nations, such as to many Latin American countries. It is not surprising that previous studies on national SWB and income distribution could result in much inconsistency. Recall that the 55-nation study by Diener, Diener and Diener (1995), including some developing nations, returned an insignificant result of income social comparison, but the time-series study by Hagerty (2000) on 8 developed nations found significant negative correlation between income inequality and national aggregate SWB.

6. Summary

This research focuses on the effect of income distribution on national aggregate subject well-being, and inevitably analyzed the effect of absolute income level. The results proved income's diminishing effect on people's happiness on an aggregate basis because the increment in income is able to raise the subject well-being much more in poorer nations than in richer nations.

Income inequality's negative effect on national aggregate SWB dominated when including nations from all levels of income, which is consistent with Paducci's prediction favoring the social comparison theory (Paducci,1995). However, distinctive results are obtained for nation groups at different income level or at a further dissection by region.

A few important findings are: For high income nations, the difference of top and bottom income gap does not seem to be as effective as the inequality spread over the whole population, while it is the opposite case for the extremely poor nations. Meanwhile, income distribution contributes more to high income nations than to low income nations. For low- or medium-income nations, especially those emerging economies in Eastern Europe, Latin America and Asia, there appear to be many more factors that would explain people's subject well-being in addition to income level and income distributions. This invites further research to offer a fuller perspective. The nations that carry unique political, social and cultural factors will demand an involvement of more variables and maybe time-series study. To summarize, economic policies related to improving subject well-being must take into account not only

income level and income inequality, but also the type of inequality as well as various political, social and cultural factors that may influence national aggregate subject well-being.

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