

# EURASIAN JOURNAL OF SOCIAL SCIENCES

[www.eurasianpublications.com](http://www.eurasianpublications.com)

---

## MEASURING THE QUALITY OF LIFE IN VIETNAM

**Nguyen Thi Xuan Mai**

National Economics University, Vietnam

Email: mainx@neu.edu.vn

---

### Abstract

Quality of life has been studied for a long time in the world. However, in Vietnam, studies on quality of life are still scarce. In fact, there is no study on measuring this concept. Based on the literature review, Vietnam's development objectives and available data, this paper proposes the methodology of measuring the quality of life in Vietnam, including developing theoretical framework, selecting indicators and composing the quality of life index. Although the quality of life in Vietnam should be considered by the capability approach in relation with the subjective wellbeing approach, the paper only calculates the quality of life index mainly based on objective indicators due to unavailable data of subjective ones. The result shows that the quality of life in Vietnam is at medium level and there are many factors that need to be improved in the future.

**Keywords:** Quality of Life, Subjective Wellbeing, Composite Index, Normalizing, Weighting, Aggregation

---

### 1. Introduction

After years of pursuing economic development goals, we gradually realize that social and human development must be at the forefront. In particular, quality of life and improving the quality of people's life are one of the ultimate targets of the Human Development Strategy at the global as well as national levels. Stiglitz *et al.* (2009) suggest that governments should shift emphasis from measuring economic production to measuring people's well-being and quality of life. Quality of life has been studied for a long time in the world. Most studies focused on constructing and measuring this concept. There are many different definitions of quality of life depending on the level of development, social and cultural notions and traditions of each country or region. However, there is no universally accepted one. This led to the continuous debates among researchers worldwide.

Raphael (1996) raised 11 debates concerning measurement of quality of life. However, in the social science, the two most debated topics are whether measurement of the quality of life is objective or subjective and what are its dimensions. Literature review shows that many research models have combined both subjective and objective indicators in the measurement of quality of life (Cummins, 2000; Hagerty *et al.* 2001; Costanza *et al.* 2007; Stiglitz *et al.* 2009, etc); and most studies considered quality of life a multi-dimensional concept (Felce and Perry, 1995; Diener and Suh, 1997; Haas, 1999; Hagerty *et al.* 2001; Costanza *et al.* 2007). Keith (2001) notes that quality of life's core dimensions can vary from one culture to another. In addition, Alkire (2015) says that there is no consensus on how many dimensions are as well as what they are. Alkire (2015, p. 9) also states: "A credible measure of quality of life is a certain type of evaluative exercise". This measure includes dimensions that are of special importance to

the society or people in question and of social influence ability that focuses on public policy rather than a private good, or a capability which cannot be influenced from outside.

Based on classic works of scholars worldwide, many countries and international organizations have studied and developed methods of measuring quality of life as a basis for assessing meaningful change in quality of life over time as well as comparing quality of life among countries, regions, cities or communities, etc.

Quality of life could be measured and monitored in two ways: developing indicator system or calculating composite index (Noll, 2010). As an abstract concept, quality of life construct is very complex and includes different dimensions. Therefore, it is difficult to conclude how the quality of life has improved as a whole by monitoring the indicator system which reflects the concept. Many international organizations and countries around the world currently prefer to use composite index to measure complex phenomena such as quality of life.

In Vietnam, the national agenda have included subjects of human development, human rights and the enhancement of quality of life for many years. However, how quality of life should be measured and the improvement of quality of life is clearly evaluated are still the questions. In general, in Vietnam, studies on quality of life are still limited and unsystematic. In fact, there is no study on measuring this construct.

The key contribution of this paper is to partly close the existing policy and research gap by introducing the approach to the quality of life in Vietnam, then defining the concept and its dimensions. The paper also proposes the quality of life indicators and method of calculating a composite index to measure the quality of life in Vietnam in order to provide useful information for making decisions at the national and local levels.

The paper is organized as follows: Section 2 defines the theoretical framework of quality of life in Vietnam including its concept and components. Section 3 provides the methodology for composing the quality of life index in Vietnam. Results and discussion are presented in Section 4. Section 5 concludes and raises some future researches.

## 2. Theoretical Framework of Quality of Life in Vietnam

At the present time, the wider research community has accepted no definitive theoretical framework of quality of life. According to Maggino and Zumbo (2012), the description of concepts depends on the researcher's point of view, the objectives of the study, the applicability of the concepts, and the socio-cultural, geographical, and historical context. Therefore, for the purpose of measuring quality of life, the development of the framework for quality of life in Vietnam will begin with the selection of a research approach. Literature review shows that there are some approaches to determine the quality of life.

In the 1960s, there were two oppositely traditional approaches in measuring quality of life, i.e. objective and subjective approaches. Objective approach based on the resources focuses on measuring objective or social indicators that reflect people's objective circumstances in a given cultural or geographic unit. This includes external life conditions, such as crime rate, unemployment rate, number of doctors per capita, etc. However, quality of life measured based on resources alone could be insufficient (Alkire, 2015). In fact, with the same resources, each person has different ways to experience and enjoy life and realize the value of life depending on his or her own characteristics.

Meanwhile, subjective approach based on utility theory is the measurement of subjective wellbeing to assess the individual's cognitive and affective reactions to her or his whole life or to specific domains of life. According to the utility theory, quality of life involves the satisfaction of the desires of individuals, in which a society is regarded as good when it provides the maximum satisfaction or positive experiences for its citizens (Cobb, 2000). In the late 1990s, this approach was accepted by many researchers as an alternative approach to explain quality of life (Diener and Suh, 1997).

In the 1970s, the utility theory was replaced by the basic needs approach based on hierarchy of needs given by Maslow (1943). The basic needs theory stated that quality of life was defined as the level of satisfaction of most members in the given society with the hierarchical needs (Sirgy, 1986). Ventegodt *et al.* (2003) assessed that the quality of life theory

based on Maslow's (1943) needs was a suitable theory. However, Tay and Diener (2011), after re-testing Maslow's (1943) theory, pointed out that universal human needs seemed to exist regardless of cultural differences but the order of needs in the hierarchy was inaccurate.

Capability approach to the quality of life was established in the 1980s and became popular in the 1990s. According to Stiglitz *et al.* (2009:42), "this approach conceives a person's life as a combination of various 'doings and beings' (functionings) and of his or her freedom to choose among these functionings (capabilities)". Some of these capabilities may be quite elementary, such as being safe, well-nourished and literate, while others may be more complex, such as participating actively in political life. Therefore, this approach has a large similarity with the objective approach based on resources (Noll, 2010). Meanwhile, Cobb (2000) considered the capability approach a new version of the basic needs approach to defining quality of life. Whereas, almost earlier attempt to devise a list of basic human needs (focusing on the requirements of physical survival) as well as to evaluate the extent to which they are met, all the recent efforts treat the requirements of a good life in a much more complex way, such as emphasizing the importance of freedom, institutional issues, etc. At present, this approach is one of the most influential theories and is the premise for the Human Development Index, the Millennium Development Goals, and many other development issues at the global level.

As a developing country, Vietnamese's life still faces many difficulties. Therefore, our goal for the coming years is to meet the basic needs, particularly, ensuring the human living conditions. Additionally, we also pay attention to human rights as well as building a free, democratic, equitable and civilized society. Vietnam's development perspectives show that quality of life in Vietnam is closely linked to human, economic and cultural development, social justice and healthy and safe living environment.

From the above-mentioned analysis, the paper suggests that the quality of life in Vietnam should be considered in the capability approach, also known as human development approach (Cobb, 2000), in combination with the subjective wellbeing approach. This means that the quality of life in Vietnam needs to be measured by both objective and subjective factors. This combination in the measurement of quality of life in Vietnam is both methodological and in line with the general trend of the world. All experts taking part in the depth interview agree with this suggestion.

Therefore, the quality of life in Vietnam should be interpreted as follows: "Quality of life is the extent to which objective human needs of living condition are fulfilled in relation to personal perceptions of subjective wellbeing". Structure of this concept will be defined based on top-down approach. The objective of identifying quality of life's dimensions is to provide a reliable measure of quality of life for Vietnam.

The objective dimensions of quality of life in Vietnam were identified based on Allardt (1993). Following the capability approach, Allardt (1993) suggested quality of life model was based on fulfilling three basic needs. Having needs include economics resources, housing conditions, employment, education and health. Loving needs include all social relationships with other people, such as friends, workmates or larger community. Being needs emphasize the personal growth and living in harmony with nature. It includes the extent to which a person can self-determine his/her own life, their opportunities for political activities, meaningful work, enjoying nature, and leisure time. In general, Stiglitz *et al.* (2009) agreed with this view.

Meanwhile, personal perceptions - the subjective dimension of quality of life in Vietnam - are considered based on theory of subjective wellbeing. According to Diener *et al.* (2009), subjective wellbeing was defined as person's cognitive and affective evaluations of his/ her life which included satisfaction with life, positive effect, and negative effect. Although each of these aspects of subjective wellbeing needs to be measured separately (Stiglitz *et al.* 2009), in fact, evaluation measures, particularly, life satisfaction have been used most often when relating to quality of life. Besides, on a basis of distinguishing different classes of subjective quality of life including wellbeing, satisfaction with life, happiness and meaning in life, Ventegodt *et al.* (2003) concluded that most theory of quality of life focused on life satisfaction. Veenhoven (1996) also said that life satisfaction was one of the indicators of an "apparent" quality of life.

Then, the theoretical framework of the quality of life in Vietnam is proposed in Figure 1 below.

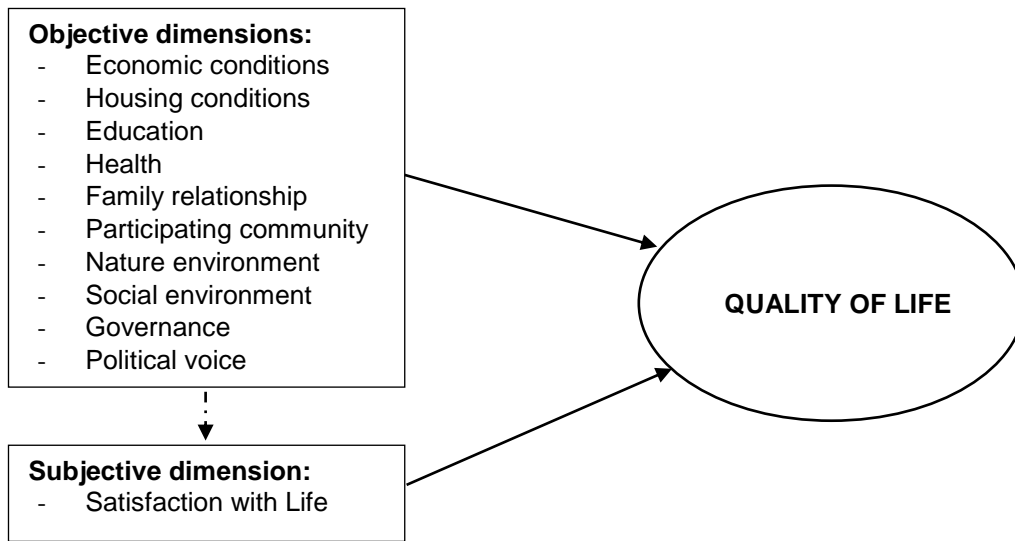


Figure 1. Theoretical framework of Quality of Life in Vietnam

Source: Author's own preparation.

### 3. Methodology for calculating Vietnam Quality of Life Index

According to Noll (2010), there are two ways to measure and monitor the quality of life, namely developing indicator system and composing a composite index. At present, most international organizations and countries in the world use a composite index to measure such complex concepts as quality of life.

The 10-step process developed by the OECD (2008) is considered an ideal and detailed procedure for composing a composite index. Most of the composite indices use this methodology despite applying a shorter procedure. In general, constructing composite index often focuses on 4 main issues: (1) Developing a theoretical framework; (2) Selecting indicators; (3) Normalizing data; and (4) Weighting and aggregating (Mazziotta and Pareto, 2013).

Based on studying the OECD's methodology as well as the construction of the quality of life indices or similar indicators of international organizations and other countries, the paper proposes the construction of Vietnam quality of life index including the following steps:

Step 1: Developing the theoretical framework of the quality of life in Vietnam, including the concept and its components.

Step 2: Selecting the quality of life indicators.

Step 3: Normalization of data.

Step 4: Determining weights.

Step 5: Calculating component indices and the composite index.

Step 1 was presented in section 2 above. However, currently, there is no data on the level of satisfaction with life in Vietnam. Like the quality of life, satisfaction with life is an abstract concept often measured by multi-items scale. Developing satisfaction with life scale is a complex task that is beyond the scope of this paper. Therefore, although the theoretical framework of the quality of life in Vietnam includes both objective and subjective aspects, the measurement of the quality of life is based only on objective aspects in this paper.

The rest of the paper focuses on the remaining steps - calculating the quality of life index in Vietnam based on objective indicators. The methods in steps 3, 4 and 5 will be selected based on suggestions of Mazziotta and Pareto (2013) and available data.

#### 3.1. Selecting Quality of Life Indicators

According to Noll (2004), there are 3 ways to select indicators: (1) data driven; (2) policy driven; or (3) concept driven. With the above theoretical framework, the paper uses the third approach,

also known as top-down approach or theoretical approach to select quality of life indicators. Hence, the process of measurement of quality of life requires a robust conceptual definition and a consequent analysis of the relationship between indicators and this concept. Indicators should be developed through a hierarchical design as suggestion of Maggino and Zumbo (2012).

The paper uses both direct and indirect indicators to measure quality of life because some desired data are unavailable. Besides, types of indicator - input, output or outcome can be used simultaneously. Although input indicators are often easier to collect, output or outcome indicators are better when assessing the effectiveness of improving quality of life. For example, with the same resources spent on health and education (input indicators), results are different across regions. The outcome indicators are the best because our ultimate goals are to evaluate quality of life and improvement of quality of life.

Currently, experts generally agree with 14 criteria used by Jacksonville Community Council, Incorporated (Florida, United States) when selecting quality of life indicators (Swain and Hollar, 2003; Young, 2008). These criteria include: (1) purposefulness, (2) importance, (3) validity and accuracy, (4) relevance, (5) responsiveness, (6) anticipation, (7) understandability, (8) availability and timeliness, (9) stability and reliability, (10) outcome orientation, (11) asset orientation, (12) scale, (13) clarity, and (14) representativeness. The paper also uses these criteria to select the quality of life indicators. These indicators are divided into 10 objective dimensions of the quality of life. They are:

Economic conditions dimension consists of the following indicators: (i) Employment rate (aged 15 and over) (%); (ii) Monthly average income per capita (VND); (iii) Poverty rate (%); (iv) Percentage of respondents reporting that their economic condition has improved in the past 5 years (%); (v) Percentage of laborers having social insurance (%).

Housing conditions dimension consists of the following indicators: (i) Percentage of households having permanent house (%); (ii) Average dwelling area per capita (m<sup>2</sup>); (iii) Percentage of households using hygienic water (%); (iv) Percentage of households using electricity (%); (v) Percentage of households using hygienic toilet (%); (vi) Percentage of households having information and communication equipment (%).

Education dimension includes: (i) Literacy rate in population aged 15 and over (%); (ii) Percentage of population with high school diploma or higher (%); (iii) Number of pupils per teacher; (iv) Net enrolment rates (%); (v) Completion rate (primary, secondary and high school) (%); (vi) Percentage of children under 5 years who are monitored for development in health, education and social psychology (%).

Health dimension includes: (i) Life expectancy at birth; (ii) Infant mortality rate (per 1000 live births); (iii) Number of doctors per 10000 people; (iv) Number of patient beds per 10000 people; (v) Percentage of children under 1 year old immunized fully vaccinations (%); (vi) Percentage of children under 5 years old malnutrition (%); (vii) Percentage of people having health insurance (%).

Family relationship dimension includes: (i) Percentage of household having a cultural family certificate (%); (ii) Divorce rate (per 1000 people); (iii) Percentage of household having family violence (%); (iv) Sex ratio at birth.

Participating community dimension includes: (i) Percentage of villages having cultural house (%); (ii) Percentage of villages having a cultural village certificate (%); (iii) Percentage of respondents having voluntary contribution to local projects (%).

Nature environment dimension includes: (i) Percentage of respondents reporting that the water quality has declined in the past three years (%); (ii) Percentage of respondents reporting that the air quality has declined in the past three years (%); (iii) Forest area (% of land area); (iv) Living solid waste collection rate (%).

Social environment dimension includes: (i) Criminal rate (per 10000 people); (ii) Percentage of respondents reported they were victims of one of the four types of crime (%); (iii) Percentage of respondents said they felt safe walking alone around the area they live during the night (%); (iv) Safety levels in localities; (v) Road traffic death rate (per 100000 people).

Governance dimension includes: (i) Transparency of local decision-making index; (ii) Control of corruption index; (iii) Public administrative procedures index.

Political voice dimension includes: (i) Percentage of people voted in the National Assembly election (%); (ii) Percentage of people voted in the Commune People's Council Election (%); (iii) Percentage of people voted in the Village Head Election (%); (iv) Percentage of respondent said that the Candidate was not suggested (%).

### 3.2. Normalization of Data

Normalization to ensure comparability across indicators is required prior to data aggregation. Normalization is used to adjust for different nature of indicators, i.e., positive or negative orientation towards the index, different units of measurement across indicators and different ranges of variation.

There are 3 main normalization types: (1) linear scale includes 2 popular methods, namely z-scores and Min-Max (rescaling); (2) ordinal scale, such as ranking and categorical scales; and (3) ratio scale, such as distance to a reference country or percentage of annual differences over time (Weziak-Bialowolska, 2014). To select the appropriate method, we should take into account the theoretical framework as well as the data properties. Besides, we should pay attention to outliers because they may become unintended benchmarks and have a strong impact on the correlation structure. Moreover, we should consider whether we want to keep outliers, whether we want to benchmark against a reference country, whether the composite is time dependent, or whether we want to keep scores for the normalized indicators (Weziak-Bialowolska, 2014).

With guidelines of Mazziotta and Pareto (2013) and available data, the paper chooses Min-Max to normalize data for its simplest and most common normalization procedure. Then, all normalized indicators have the same range of variation (0.1), but not necessarily the same variance. The higher normalized indicator is, the better quality of life is.

$$X_{Normalized} = \frac{X_{Real} - X_{Min}}{X_{Max} - X_{Min}} \quad (1)$$

An advantage of Min-Max over z-scores is that rescaling widens the range of an indicator with a small range of values, as it allows differentiation between units with similar levels of performance. However, Min-Max is inappropriate in the presence of outliers, which can distort the normalized indicator. Therefore, some treatments should be made to avoid the cases in which outliers bias the results, such as using logarithmic transformation. Maximum and minimum values are usually determined depending on available data and actual experiences in composing global indices such as HDI. Specifically:

For indicators which have absolute value/or ratio value/or value per capita: If the indicator having value in a certain range, the minimum and maximum values are the respective minimum and maximum values. It is possible to refer to the minimum and maximum values established by international organizations for published indicators, such as 'life expectancy at birth'. In other cases, the minimum and maximum values should be defined based on the actual values achieved in units (i.e. provinces) for many years. With some given indicators, it is advisable to widen the achievement gap so that the minimum and maximum values can be used for many years to ensure comparability of the indicator over time. Additionally, we should use the logarithmic transformation with highly skewed indicators, as follow:

$$X_{Normalized} = \frac{\ln(X_{Real}) - \ln(X_{Min})}{\ln(X_{Max}) - \ln(X_{Min})} \quad (2)$$

For indicators which have percentage value, the smallest value is 0 and the largest value is 100 (%) in theory. There are two ways to determine the minimum and maximum values.

The first way is to choose the minimum value as 0 and the maximum value as 100. The value of 100 of positive indicators or the value of 0 of negative indicators indicates the best achievement in the quality of life. The advantages of this selection are simple, easy to implement and ensure comparability of indices over time because of fixed minimum and maximum values. Moreover, this selection reduces the probability of normalized indicators

receiving value of 0 since actual value is equal minimum or maximum value. However, there are some indicators that actually are impossible to achieve these values, e.g, 'poverty rate' is 100 or 'literacy rate (%) in population aged 15+' is 0.

The second way is to choose the minimum and maximum values based on the actual values achieved in provinces for many years. For example, the maximum value of 'poverty rate' is 50.8% which was defined in Dien Bien in the year 2010. The limitation of this selection is that indices in different years may not be comparable due to variation of the minimum and maximum value over time. Furthermore, many indicators have not been disaggregated at the provincial level so it is impossible to determine the minimum and maximum values.

Therefore, the paper chooses the first one to fit the current condition of data. In case of negative indicators, normalization is used to transform the value into positive orientation. Then the normalized equation is defined as follows:

$$X_{Normalized} = \frac{X_{Max} - X_{Real}}{X_{Max} - X_{Min}} = 1 - \frac{X_{Real} - X_{Min}}{X_{Max} - X_{Min}} \quad (3)$$

As a result, the normalized result is considered the distance to the maximum value of the indicator. The higher the distance is, the lower the value of the negative indicator is, the better the quality of life is.

For indicators which have optimal value, meaning that their values are either too high or too low is not good, such as 'forest area (% of land area)': Basically, the value of these indicators should be close to a certain central value (the optimal threshold). Therefore, in addition to determining the minimum and maximum values, the central values should be defined. The normalized equation is defined as follow:

$$X_{Normalized} = 1 - \frac{|X_{Real} - X_{Central}|}{X_{Max} - X_{Min}} \quad (4)$$

### 3.3. Weighting

Determining weights, in other words, the relative importance of the indicators/components, is a source of contention because weights can have a significant effect on the overall composite index and the country/province rankings. In general, weights should be selected in connection with both the theoretical framework and the data properties. No agreed methodology exists to weight individual indicators.

Since the structure of the quality of life concept is composed of several dimensions, we must calculate the component indices before calculating the composite index. Thus, two types of weights should be determined. The former is the weight of each individual indicator when calculating the component index and the latter is weight of each component when calculating the composite index.

The results of in-depth interviews show that in measuring the quality of life, individual indicators in each component should be considered equally but components should have different weights. This approach is consistent with the available data.

Weights can be defined objectively or subjectively. Objective weights are determined by statistical methods based on mathematical models, therefore, they are more objective and less controversial.

Regression analysis is one of the statistical methods to determine the objective weight. Typically, a linear multiple regression equation will be used to estimate the weights of a set of variables by the least square method. However, the difficulty of this method is to point out the appropriate dependent variable (not in the form of a composite index) while the phenomena measured are often abstract concepts which cannot be captured by an indicator, such as the quality of life concept. Other methods are factor analysis, data envelopment analysis and unobserved components models, etc. Due to lack of accordant data, it is impossible for the paper to use these methods to determine the objective weights.

Weights can be assigned equally, i.e. all variables are given the same weight. Hagerty and Land (2007) noted that if there were no way to choose objective weights, assigning equal

weight was the best way to limit controversies. So, equal weights should be used in the absence of statistical or an empirical basis, e.g. when there is insufficient knowledge of causal relationships or a lack of consensus on the alternative. Besides, according to Nadro *et al.* (2005), the effect of equal weightings also depends on how indicators are divided into groups or dimensions. Equal weighting among indicators in one dimension does not mean that equal weighting between dimensions. Similarly, equal weighting between dimensions could disguise different weights applied to indicators in one dimension.

The subjective unequal weights can be determined with the involvement of stakeholders, including experts, politicians, users, and people, etc. This approach is feasible when there is a well-defined basis for certain policy, such as the Development Strategy or the Plan for five or ten years. In addition, according to the Khien (2014), this method is acceptable because each person's view is subjective but view aggregated from a large enough number of people can be objective.

Typically, experts consulted are those who have a wide spectrum of knowledge, experience and concerns of the field of study. Each expert will give his or her opinion based on observable behaviors or theories. By aggregating the opinions of experts, researchers can determine the appropriate weights. There are some expert methods often used, such as budget allocation processes, analytic hierarchy processes and conjoint analysis.

In some cases, weights can be determined according to user's opinion. For example, (OECD, 2018) provides an online tool that allows people to evaluate the role of indicators in their own opinions. Public opinion polls have been extensively used over the years as they are easy and inexpensive to carry out. However, this weighting might not accurately reflect the views of society and policy implications for these results are not well defined. The best solution is to collect from a large, representative sample. This is not an easy thing to do in practice. On the other hand, in public opinion polls, the selected issues should have been already on the national agenda, and thus attract the attention of the media.

The paper uses the budget allocation approach (BAP) to determine subjective weights for components of the quality of life. BAP method is capable of fitting with all aggregation methods including linear aggregations, geometric aggregations and multi-criteria approach. In the BAP, experts are given a "budget" of N points, such as 10 or 100, to be distributed over the number of component indicators. They will pay more for those indicators whose importance they want to stress. However, the BAP is optimal for a maximum of 10-12 indicators. The experts can be confused if there are too many indicators involved.

### 3.4. Aggregation

In addition to determining the weighting procedure, an aggregate method is also a controversial issue in composing composite indices. In general, the choice of how the index is aggregated depends on the view about whether compensability between individual indicators or dimensions is allowed.

According to Nadro *et al.* (2005), while the additive (linear) aggregation method is useful when all individual indicators have the same measurement unit, the geometric aggregation is appropriate when sub-indicators are non-comparable and strictly positive and expressed in different ratio-scales. In both aggregations, weights express trade-offs between indicators/dimensions, i.e. deficits in one indicator/ dimension can be compensated by surplus in another. The compensability is constant in additive aggregations, while compensability is lower when the composite contains indicators having low values in geometric aggregations.

In general, the values of index calculated by additive aggregations are higher than by geometric aggregations. This difference depends on the difference between the indicators. Therefore, for the purpose of improving rankings, countries with lower scores generally prefer additive aggregations rather than geometric aggregations as low score of one indicator could be compensated from high scores of the others. However, with geometric aggregations, the marginal utility of an increase in the low score is much higher than in the high score so a country/province will have greater motivation to deal with outstanding issues aiming at improving its position in the ranking.



When different goals are equally reasonable and important, there should be a non-compensation view. For example, regarding to the sustainable development, all of three dimensions, namely economic, social and environmental one must be equally developed. Thus, economic growth cannot compensate for social instability or environmental destruction. In this case, both additive aggregations and geometric aggregations are inappropriate. Multi-criteria approach assures non-compensability by finding a compromise between two or more legitimate goals. This approach does not reward outliers since it keeps only the ordinal information. However, this method could be computationally costly when the number of countries is high as the number of permutations to calculate grows exponentially (Munda and Nardo, 2009).

As mentioned above, we must calculate the component indices before calculating the composite index. Mazziotta and Pareto (2013) suggest to adopt a compensatory approach within each dimension and a non-compensatory or partially compensatory approach among the various dimensions. Thus, component indices can be aggregated by additive methods, such as the arithmetic mean, while composite index can be aggregated by geometric methods, such as the geometric mean following the partially compensatory approach or the Multi-criteria Analysis following the non-compensatory approach.

In this paper, the arithmetic mean should be used to calculate components indices of the quality of life index in Vietnam. It means that compensation among indicators in each dimension is allowed. Moreover, this aggregation is appropriate when some of the indicators in the component have a normalized value of zero, i.e. failure in the achievement of quality of life. The arithmetic means keep the component indices away from value of zero.

Because of equal weights among indicators in each dimension, the component indices are calculated by simple mean formula as follows:

$$I_i = \frac{\sum_{j=1}^m X_{Normalizedj}}{m} \quad (5)$$

where  $I_i$  is component index of dimension  $i$  ( $i=1, n$ );  $n$  is the number of components;  $X_{Normalizedj}$  is value of individual indicator  $j$  after normalization in each component ( $j=1, m$ ); and  $m$  is the number of indicators in each component.

However, geometric mean should be useful in calculating the quality of life index in Vietnam. In fact, every component plays an important role in achieving a good life quality, that is, one person who has good income, education and medical care but lives in an insecure condition could not be considered to have a good quality of life. Therefore, to improve the quality of life, all components must be improved at the same time. Nevertheless, as a transitional economy, most social resources are still predominantly focused on economic development, so the quality of life's components cannot be completely offset each other. Thus, with a view of partially compensation, that the quality of life index should be calculated by geometric mean will encourage the equal development of all quality of life's components in Vietnam.

Because of unequal weights among components, the quality of life index is calculated by weighted geometrics mean, as follow:

$$I = \sqrt[\sum f_i]{\prod_{i=1}^n I_i^{f_i}} \quad (6)$$

where  $I$  is the quality of life index;  $I_i$  is the component index  $i$ ;  $f_i$  is weight of the component index  $i$ . The quality of life index has the minimum value as 0, i.e., completely poor quality of life and the maximum value as 1, i.e. completely good quality of life.

#### 4. Results

Due to the heterogeneous spatial and temporal data, the paper only calculates the quality of life index in Vietnam at the national level in 2016. In addition, this composite index is calculated based on 10 groups of indicators reflecting the objective quality of life because of unavailable

data on the satisfaction with life. The individual indicators are normalized by the Min-Max transformation as mentioned above.

The weightings of the component indices are determined by the BAP method. In general, BAP method is quite suitable with this study. With 10 objective dimensions, experts have no difficulty to score by constant sum scaling. Moreover, it is easier to ask the experts to score components than to compare pairs of components as the requirement of analytic hierarchy processes method. Therefore, more experts will be willing to answer.

In this case, 52 experts include researchers, lecturers, policy maker, and civil servants, etc. in the fields of economy, sociology, demography, and statistics, etc. at universities, research institutes, research centers, ministerial agencies, international organizations, etc. in Vietnam. Experts have the same role in the assessment. Thus, the scores for each component are determined by the simple arithmetic mean formula (Table 1).

**Table 1. Weights of the quality of life's dimensions**

Dimension	Symbol	Mean score	Weight
Economic conditions	TP1	19.0	1.9
Housing conditions	TP2	12.6	1.2
Education	TP3	11.4	1.2
Health	TP4	11.6	1.2
Family relationship	TP5	10.9	1.2
Participating community	TP6	5.1	0.5
Natural environment	TP7	9.5	0.9
Social environment	TP8	8.8	0.9
Governance	TP9	6.6	0.5
Political voice	TP10	4.5	0.5
<b>Total</b>		<b>100.0</b>	<b>10.0</b>

Source: Author's own calculation.

Besides, pair sample t-test is useful to examine whether there is a significant difference in mean scores among the quality of life's dimensions. If the dimensions have no significant difference in mean scores, they can be grouped into one group and have equal weights. P-values of these test are presented in Table 2.

**Table 2. Matrix of P-values of pair sample t-test**

	TP1	TP2	TP4	TP3	TP5	TP7	TP8	TP9	TP6	TP10
TP1	-	0	0	0	0	0	0	0	0	0
TP2	0	-	<b>0.133</b>	<b>0.061</b>	<b>0.058</b>	0	0	0	0	0
TP4	0	<b>0.133</b>	-	<b>0.493</b>	<b>0.413</b>	0	0	0	0	0
TP3	0	<b>0.061</b>	<b>0.493</b>	-	<b>0.535</b>	0.003	0	0	0	0
TP5	0	<b>0.058</b>	<b>0.413</b>	<b>0.535</b>	-	<b>0.141</b>	0.020	0	0	0
TP7	0	0	0	0.003	<b>0.141</b>	-	<b>0.113</b>	0	0	0
TP8	0	0	0	0	0.020	<b>0.113</b>	-	0.002	0	0
TP9	0	0	0	0	0	0	0.002	-	0.005	0
TP6	0	0	0	0	0	0	0	0.005	-	0.022
TP10	0	0	0	0	0	0	0	0	0.022	-

Source: Author's calculation.

Results in the Table 2 show that at a significance level of 0.01 or 0.05 in some cases, 10 quality of life's dimensions can be divided into 4 groups: (1) economic conditions; (2) housing conditions, education, health and family relationship; (3) nature environment and social environment; and (4) participating community, governance and political voice (although these dimensions are significantly different, their mean score are small and approximate).

Then, weight of each dimension in each group is calculated by simple mean of mean scores of all dimensions in that group dividing by 10. Hence, sum of weights is 10. Column 'Weight' in Table 1 shows these results.

Table 3 shows the values of component indices with data of 2016. Component indices are calculated by formula (5).

**Table 3. Results of calculating component indices**

Component	Symbol	Component index
Economic conditions	$I_1$	0.617
Housing conditions	$I_2$	0.791
Education	$I_3$	0.608
Health	$I_4$	0.695
Family relationship	$I_5$	0.864
Participating community	$I_6$	0.574
Natural environment	$I_7$	0.601
Social environment	$I_8$	0.733
Governance	$I_9$	0.572
Political voice	$I_{10}$	0.564

**Source:** Author's own calculation.

Using the formula (6) with the values of component indices in Table 3 and their weights in Table 1, the quality of life index in Vietnam in 2016 is 0.671.

With the value of 0.671, the achievement of quality of life in Vietnam is at medium level. This result is generally consistent with the value of the Vietnam's HDI in 2016 (0.683).

Among the quality of life's component indices, the score of family relationship is the highest (0.864). This finding is consistent with the study of Thinh (2012) which shows that people seem to be most satisfied with the relationship of parents and children; marriage, family and children. Next is the score of the housing conditions (0.791) and the social environment (0.733).

Economic condition is considered to have the most impact on people's life but its score is only at medium level. This result is in line with the former researches. Huong (2012) notes that economic conditions, especially income, have a significant effect on the satisfaction of spiritual life. However, people are less satisfied with this dimension of their life (Thinh, 2012).

The scores of dimensions including natural environment, governance, political voice, and participating community are all relatively low. In fact, while people are struggling with life, they are less interested in these aspects of their lives. Low people's intellectual standard, lack of awareness of their rights, and responsibilities might be the reasons. These are also the reasons that many experts have given low scores when assessing the importance of these dimensions to the quality of life in Vietnam.

## 5. Conclusion and future research

Over the past years, the quality of life has been a subject attracting the attention of many researchers, policy makers, and people all over the world. However, in Vietnam, studies on the quality of life remain limited although it is an important issue to be referred to in the national agenda. This study was conducted to provide reasonable measurement of the quality of life in Vietnam which is the basis for policy making in order to bring the better life for people.

Although the quality of life in Vietnam should be considered by the capability approach in relation with the subjective wellbeing approach, the measurement of this concept is mainly based on objective indicators due to unavailable subjective indicators. Therefore, the relationship between subjective and objective aspects is not clarified, particularly, in composing the quality of life index. Additionally, quality of life' indicators are not sufficient, such as lack of indicators of environmental quality, and family relationship quality, etc.

In the future, we should further develop studies on the quality of life and other similar subjects in Vietnam, including satisfaction with life, or happiness because they are the ultimate

goal in our life. These future studies should be concentrated on improving the theoretical framework, indicator system, and methodology of composing the quality of life index. Besides, it is important to develop the quality of life scale which will be useful to re-test the quality of life concept, its structure and determine the objective weights. These studies should also focus on subjective wellbeing, for example, developing the satisfaction with life. In addition to evaluating the scales, the studies must find out the factors that influence the quality of life or the people's perception of their life as well as the relationship between them. That expanding research in this new field will help us to understand and measure the quality of life in Vietnam more scientifically and accurately.

## References

- Alkire, S., 2015. *The capability approach to the quality of life*. OPHI Working Paper No. 94.
- Allardt, E., 1993. Having, loving, being: An alternative to the Swedish model of welfare research. In: M. Nussbaum and A. Sen, eds. 1993. *The quality of life*. Gloucestershire: Clarendon Press. pp. 88-95.
- Cobb, C. W., 2000. *Measurement tools and the quality of life*. San Francisco: Redefining Progress.
- Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., Danigelis, N. L., Dickinson, J., Elliott, C. and Farley, J., 2007. Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological economics*, 61(2), pp. 267-276. <https://doi.org/10.1016/j.ecolecon.2006.02.023>
- Cummins, R. A., 2000. Objective and subjective quality of life: An interactive model. *Social Indicators Research*, 52(1), pp. 55-72. <https://doi.org/10.1023/A:1007027822521>
- Diener, E. and Suh, E., 1997. Measuring quality of life: Economic, social, and subjective indicators. *Social Indicators Research*, 40(1-2), pp. 189-216. <https://doi.org/10.1023/A:1006859511756>
- Diener, E., Oishi, S., and Lucas, R. E., 2009. *Subjective well-being: The science of happiness and life satisfaction*. In: S. J. Lopez and C. R. Snyder, eds. 2009. *The Oxford Handbook of Positive Psychology*. New York, NY: Oxford University. pp. 187-194
- Felce, D. and Perry, J., 1995. Quality of life: Its definition and measurement. *Research in Developmental Disabilities*, 16(1), pp. 51-74. [https://doi.org/10.1016/0891-4222\(94\)00028-8](https://doi.org/10.1016/0891-4222(94)00028-8)
- Haas, B. K., 1999. Clarification and integration of similar quality of life concepts. *Journal of Nursing Scholarship*, 31(3), pp. 215-220. <https://doi.org/10.1111/j.1547-5069.1999.tb00483.x>
- Hagerty, M. R., Cummins, R. A., Ferriss, A. L., Land, K., Michalos, A. C., Peterson, M., Sharpe, A., Sirgy, J. and Vogel, J., 2001. Quality of life indexes for national policy: Review and agenda for research. *Social Indicators Research*, 55, pp. 1-96. <https://doi.org/10.1023/A:1010811312332>
- Hagerty, M. R. and Land, K. C., 2007. Constructing summary indices of quality of life: A model for the effect of heterogeneous importance weights. *Sociological Methods & Research*, 35, pp. 455-496. <https://doi.org/10.1177/0049124106292354>
- Huong, D. T. T., 2012. Cac yeu to tac dong den muc do hai long ve doi song tinh than [Factors affecting the level of satisfaction with spiritual life]. *Tap chi Xa hoi hoc*, 4 (120).
- Keith, K. D., 2001. International quality of life: Current conceptual, measurement, and implementation issues. *International Review Of Research In Mental Retardation*, 24, pp. 49-74. [https://doi.org/10.1016/S0074-7750\(01\)80005-7](https://doi.org/10.1016/S0074-7750(01)80005-7)
- Khien, T. V., 2014. Nghiien cuu phuong phap luan xay dung chi so danh gia tong hop cac chi tieu thong ke khac nhau ve kinh te - xa hoi o Viet Nam. Bao cao tong hop Ket qua nghiien cuu khoa hoc, De tai cap co so cua Tong cuc Thong ke, 2014. [Methodology for developing the composite indicator assessing social-economic issues in Vietnam, Findings report, Project of General Statistic Office of Vietnam, 2014]

- Maggino, F. and Zumbo, B. D., 2012. Measuring the quality of life and the construction of social indicators. In: K. C. Land, A. C. Michalos, and J. Sirgy, eds. 2012. *Handbook of social indicators and quality of life research*. Heidelberg: Springer. pp. 201-238. [https://doi.org/10.1007/978-94-007-2421-1\\_10](https://doi.org/10.1007/978-94-007-2421-1_10)
- Maslow, A. H., 1943. A theory of human motivation. *Psychological Review*, 50(4), pp. 370-396. <https://doi.org/10.1037/h0054346>
- Mazziotta, M. and Pareto, A., 2013. Methods for constructing composite indices: One for all or all for one. *Rivista Italiana di Economia Demografia e Statistica*, 67(2), pp. 67-80.
- Munda, G. and Nardo, M., 2009. Noncompensatory/nonlinear composite indicators for ranking countries: a defensible setting. *Applied Economics*, 41(12), pp. 1513-1523. <https://doi.org/10.1080/00036840601019364>
- Nadro M., S. M., Saltelli A. and Tarantola S., 2005. *Tools for composite indicators building*. EUR 21682 EN, Joint Research Centre, Ispra.
- Noll, H.-H., 2004. Social indicators and quality of life research: Background, achievements and current trends. In: Genov N., eds. 2004. *Advances in sociological knowledge*. Heidelberg: Springer. pp. 151-181.
- Noll, H.-H., 2010. Measuring and monitoring the quality of life. Workshop on “well-being and its various measurements”.
- OECD, 2008. *Handbook on constructing composite indicators: Methodology and user guide*. [pdf]. Available at: <<http://www.oecd.org/sdd/42495745.pdf>> [Accessed on 10 February 2018].
- OECD, 2018. *What's the Better Life Index?* [online]. Available at: <<http://www.oecdbetterlifeindex.org/about/better-life-initiative/>> [Accessed on 12 November 2018].
- Raphael, D., 1996. Defining quality of life: Eleven debates concerning its measurement. In: R: Renwick, I. Brown, and M. Nagler, eds. 1996. *Quality of life in health promotion and rehabilitation*. Thousand Oaks, CA: Sage Publications. pp. 146-170.
- Sirgy, M. J., 1986. A quality-of-life theory derived from Maslow's developmental perspective. *American Journal of Economics and Sociology*, 45, pp. 329-342. <https://doi.org/10.1111/j.1536-7150.1986.tb02394.x>
- Stiglitz, J., Sen, A. and Fitoussi, J.-P., 2009. The measurement of economic performance and social progress revisited. Reflections and overview. Commission on the Measurement of Economic Performance and Social Progress, 2009 Paris.
- Swain, D. and Hollar, D., 2003. Measuring progress: Community indicators and the quality of life. *International Journal of Public Administration*, 26(7), pp. 789-814. <https://doi.org/10.1081/PAD-120019247>
- Tay, L. and Diener, E., 2011. Needs and subjective well-being around the world. *Journal of personality and social psychology*, 101(2), pp. 354-365.
- Thinh, H. B., 2012. Su hai long ve cuoc song cua nguoi Viet Nam: mot so phat hien ban dau va ham y chinh sach [Satisfaction with Vietnamese people's life: initial findings and policy implications]. *Tap chi Nghien cuu Con nguoi*, 4/2012.
- Veenhoven, R., 1996. *The study of life-satisfaction*. Rotterdam: Erasmus University Press.
- Ventegodt, S., Merrick, J. and Andersen, N. J., 2003. Quality of life theory I. The IQOL theory: An integrative theory of the global quality of life concept. *The Scientific World Journal*, 13(3), pp. 1030-1040. <https://doi.org/10.1100/tsw.2003.82>
- Weziak-Bialowolska, D., 2014. Normalisation. *12th JRC Annual Training on Composite Indicators and MCDA 22-26/09/2014*, Ispra IT, 2014.
- Young, R. D., 2008. Quality of life indicator systems—definitions, methodologies, uses, and public policy decision making. *February*, 25, pp. 1-19.