

Article

Quality of Life Regional Differences: Case of Self-Governing Regions of Slovakia

Judit Oláh ^{1,2,*} , Zuzana Hajduová ³, Roman Lacko ⁴  and Pavol Andrejovský ⁴

¹ Faculty of Economics and Business, Institute of Applied Informatics and Logistics, University of Debrecen, 4032 Debrecen, Hungary

² TRADE Research Entity, North-West University, Faculty of Economic and Management Sciences, Vanderbijlpark 1900, South Africa

³ Department of Business Finance, Faculty of Business Management, University of Economics in Bratislava, Dolnozemska cesta 1, 852 35 Bratislava, Slovakia; zuzana.hajduova@euba.sk

⁴ Department of Economy, Faculty of Business Economics with seat in Košice, University of Economics in Bratislava, Dolnozemska cesta 1, 852 35 Bratislava, Slovakia; roman.lacko@euke.sk (R.L.); pavol.andrejovsky@euke.sk (P.A.)

* Correspondence: olah.judit@econ.unideb.hu

Received: 8 March 2020; Accepted: 6 April 2020; Published: 7 April 2020



Abstract: Quality of life is one of the most important areas of human well-being explored worldwide. The issue of quality of life, namely its quantification, is a current topic evidenced by a number of literary sources in the literature. We solved this issue in the conditions of the Slovak Republic and within this problem, we analyzed the development of the quality of life parameters for each self-governing region of Slovakia. We calculated a Quality of Life Index for the regions of Slovakia using selected indicators. We compared the quality of life in the regions of Slovakia and selected parameters suitable for calculating the overall index together with the methodology of the index's creation. We found that there are statistically significant differences between regions, in terms of economic, social and environmental factors. The assessment of the quality of life in the regions of Slovakia, as well as the assessment of the quality of life also on the level of Slovakia, even internationally, is an important aspect affecting the further development of society and the existence of humanity itself.

Keywords: ecosystem health; quality of life; urbanization; indicators; self-governing regions

1. Introduction

Public health and overall citizens' status are basic assumptions for increasing the prosperity of the economic system. Disturbance of the ecosystem balance and the permanent pollution of the environment and its impact on human development are nowadays much discussed topics in various forums. According to some authors, there are three main philosophical approaches to determine the quality of life [1]. The first approach describes the well-being characteristic of normative ideals based on religion, philosophy or other systems. The second approach is based on satisfying preferences. Under this approach, the quality of life is based on whether citizens can get the things they desire. The third definition of quality of life comes from the perspective of individuals [2]. The compendium of well-being indicators on economic and social progress clearly differentiate material conditions from the quality of life. In material conditions of life, this means economic well-being (economic well-being).

It is very important to measure and assess the impact of pollution on the environment using established indicators and econometric models to provide scientists and politicians with a clear view of the state of the environment [3]. The results of the individual studies are, in some cases, unclear,

so it is essential to find new ways of measuring and assessing negative impacts on the life quality of the population.

According to scientists, there is no consensus on the various econometric models that would explain precisely the behavior of individual countries. However, this also causes one to acknowledge that different countries treat their environment differently; that is, they have their specific methods, which can sometimes lead to an improvement in the quality of life of the population in a given country. It is necessary to look for such ways and take comprehensive measures regarding environmental behavior. The attitude of the population towards natural resources is, in most cases, positive because they perceive it as an economic benefit [4,5]. Many studies have found differences in the attitudes between country and city life perceptions [6,7].

In most cases, studies focus on gross domestic product. In economic science, the perception throughout society is that the size of the gross domestic product does not automatically reflect people's daily lives, and that there is no linear relationship between the growth of gross domestic product and the improvements in living standards and a better life for the people of the country. This problem is particularly highlighted in the Stiglitz report [8]. However, there are studies that have developed a model based on the population density aspect [9].

The influence of the Human Development Index [10–12] was examined in the authors' works. The social impact of politics was examined [13], and it was even stated that better information literacy skills are linked to quality of life [14]. Food satisfaction and various other factors were included in the Social Progress Index. The aspect of tourism was mentioned in works [15,16], and in [17] of the consumption of goods and its impact on the quality of life of the population. Some studies [18] emphasized that this issue must be taken in cooperation with the social aspects of human existence and the development of well-being. The assessment and solution must have a multidisciplinary dimension. There are also other indices which have been researched, such as the Better Life Index [19]. The improvement of quality of life is a wide problem which can also be connected to some less observed processes [20], and this concept is directly connected with sustainability [21–23].

The political sphere affects the quality of the environment and economic factors [24]. The level of economic and social development, the quality of the environment and the well-being of the population are clearly influenced by socio-political factors. According to the above-mentioned state of the art, we find it very important and we aim for this study to compute individual values of a Quality of Life Index on the regional level as researched in other studies [25], which could be very helpful for improving the policies of improving the quality of life on a national level. We will also respect the national characteristics and slightly modify the indicators used for the computation, in terms of the Slovak Republic as a part of the Vysehrad Four countries [26]. Based on the above state of the art and the missing literature in terms of the Central European countries, the main aim of this study is to develop and evaluate the current state of the selected factors of citizens' life and overall quality of life in the individual self-governing regions of Slovakia, and to assess the regional disparities.

2. Materials and Methods

The review of the past approaches to quality of life assessment includes the collection and study of available domestic and foreign literature dealing with the issue. Based on the knowledge of the current state of the problem, we deal with the construction of a custom composite indicator. The aim of the composite indicator is to provide a synthesis by combining indicators and other statistical data related to the area of quality of life to the one extent. The individual analyses and research carried out in the framework of this study are based on descriptive and multidimensional statistics. We computed our data on a regional basis. The division of Slovakia into eight self-governing regions (NUTS 3 level) is shown in the next Figure 1.

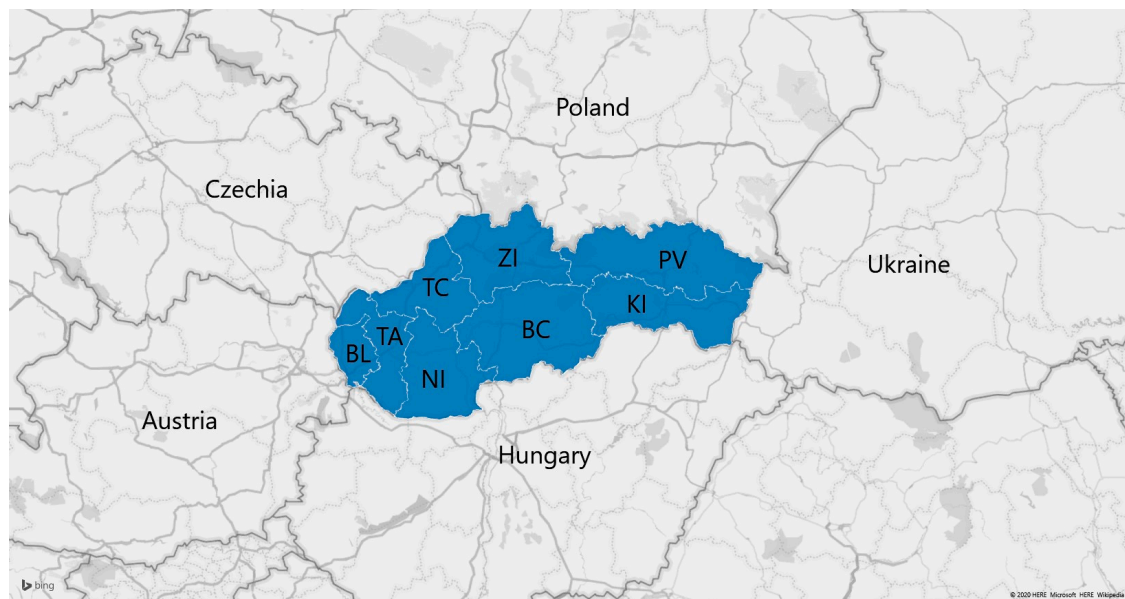


Figure 1. Division of Slovakia into regions. Source: Own processing using MS Excel. Note: BC–Banská Bystrica region, BL–Bratislava region, KI–Košice region, NI–Nitra region, PV–Prešov region, TC–Trenčín region, TA–Trnava region, ZI–Žilina region.

In selecting the quality of life factors, we will focus primarily on the objective criteria that will ensure the comparability of the results, thereby creating a platform for further research. The technical problem that needs to be dealt with when computing the composite indicator itself is usually the heterogeneity of the partial indicators that we treat by normalization of the data. A normalization of time series can be accomplished in a variety of ways, including ranking, standardization, min–max, distance to difference, among others. Due to the fact that input indicators that provide useful information could be high in number, for construction of the Quality of Life Index, built on the multi-criteria model, it is essential to structure all these dimensions into the area of interest in assessing the quality of life. Key areas can be analyzed through indicators (which can be direct, indirect or constructed) and then be processed as independent evaluation criteria. The composite indicator is chosen for solving the issue of quality of life because the aggregate indicator can be comprised of the multidisciplinary aspects that arise from the very concept of quality of life.

Authors have pointed out this method of measuring and defining of the quality of life [27]. In this work, regional analyses of the quality of life in the eight self-governing regions of Slovakia were used. The input indicators are selected based on the identification of the most important empirically confirmed factors of quality of life [28,29]. We have created our own Quality of Life Index in the regions of Slovakia, since there is no available index on a regional level. The structure of the individual indexes was based on Mederly's research dedicated to index structure [30,31]. The regional indexes were also measured and evaluated in the other studies [32,33].

The choice of these indicators was also based upon the availability of data (only some indicators are available on the regional NUTS 3 level) in each region of Slovakia. The reference researched period is the years 2008–2018.

The index is composited from single partial indices, which are named Index I., II. and III. The source data for the design was the database of the Statistical Office of the Slovak Republic [34]. The values of all indicators for each region are measured as the ratio of the average value of the indicator for the Slovak Republic. If the value is higher in a particular region than the average value for Slovak Republic and include a positive impact on the quality of life, it is the sum of 100 plus the value of which is above the average of SR. If the values are above-average in the region and there is a negative impact on the quality of life, the difference is subtracted from the value of 100. The 100 points of the index represent

the average level of quality of life in a given year in the regions of Slovakia. Values below 100 points are an unfavorable level of quality of life relative to the average of the Slovak Republic. Values above 100 points are a favorable level of quality of life relative to the average of the Slovak Republic.

$$Indicator_{year} = \frac{AVR_{year}}{AVS_{year}} \times 100 \quad (1)$$

where AVR_{year} is the actual value of the indicator in the selected region; AVS_{year} is the actual value of the indicator in Slovakia.

All three partial indexes I., II. and III. are then measured as an average of the incorporated indicators. For example, Index I. is computed as follows:

$$Index I_{year} = \frac{\sum_{i=1}^3 Indicator_{i, year}}{3} \times 100 \quad (2)$$

where $Indicator_{i, year}$ represents individual value of every indicator in the selected year.

Justification of the indicators:

Index I.

- (a) GDP per resident is the most used indicator of economic performance in the region;
- (b) Registered unemployment rate is the main indicator of the labor market situation in the region. Unemployed people have lower incomes, and therein a lower quality of life;
- (c) Average purchase price of a flat is an indicator reflecting the development of real estate prices in a particular region.

Index II.

- (a) Number of divorces per 1000 marriages is an indicator which indicates the social coherence of the population in the region. It reflects satisfaction and good relationships in marriage, which is also related to the quality of life;
- (b) Average old-age pension is related to the average gross monthly wage. The higher an income brings the possibility for higher consumption, therein increasing the quality of life;
- (c) Number of deaths per 1000 inhabitants. In regions with a higher quality of life, this indicator is lower than in regions with a higher value of this indicator.

Index III.

- (a) Number of crimes per 1000 inhabitants is an indicator that is directly linked to civil security, and therein the quality of life;
- (b) Number of fires per 1000 inhabitants. Regions with lower relative fires can be considered as a region with a safer environment and better quality of life;
- (c) Length of highways and first-class motorways and roads. This indicator indicates the region's infrastructure and its condition.

Monetary indicators are presented in fixed prices. Table 1 indicates the response of the citizens to the rise of the individual indicators.

Table 1. Division into indicators with positive response and negative response.

Positive Response	Negative Response
GDP/resident	Registered unemployment rate
Average old-age pension	Average purchase price of a flat
Length of highways and first class motorways and roads	Number of divorces per 1000 marriages
	Number of deaths per 1000 inhabitants
	Number of crimes per 1000 inhabitants
	Number of fires per 1000 inhabitants

For each of the monitored indicators, we calculated the average values clearly by using the chopped average method, where the selected percentages of the lowest and highest values are not included in the average calculation. In the submitted work, we operated with the values of the eight regions of Slovakia mentioned in Figure 1 [35,36]. After computation of the three indexes, we constructed the overall index, the Quality of Life Index, as an average of Indexes I., II. and III. As all three indexes are very important, we did not use weights. Researchers highlight that finding the right ratio between social, economic and environmental factors is hard to find [10]. This process will need deeper research and, maybe, a questionnaire on the perception of the importance of these indicators by the citizens of Slovakia. This is beyond the aim of the presented study.

3. Results

In this section, we focus on the development of quality of life in the regions of Slovakia during the years 2008–2018, using the index of quality of life in the regions of Slovakia.

3.1. Index I.

This index mainly concerns the macro-economic characteristics. The results of the computed indicators are shown in Figure 2.

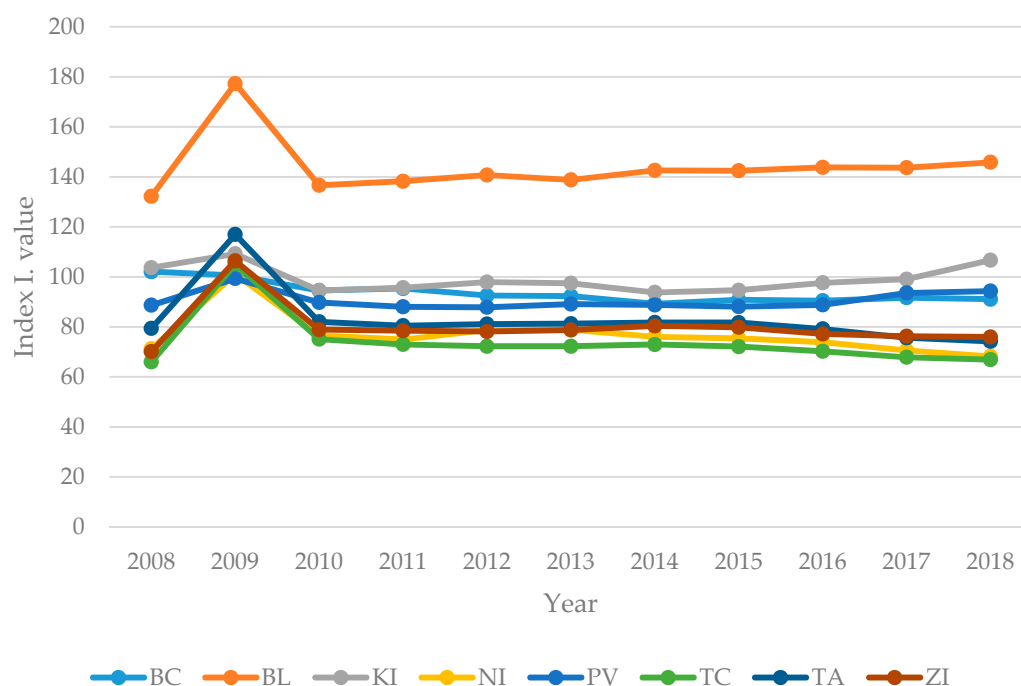


Figure 2. Development of calculated values of Index I. Source: Own processing.

An above-average value of the Quality of Life Index was measured in the Bratislava region. It reached values higher than average with respect to the value of the index's 100 points in every year. Therefore, we can conclude that the Bratislava region achieved the best value in the Quality of Life Index I. of all the regions of Slovakia for the period. The values of the Košice region were in some years just below 100 points, which means that the quality is below average, albeit with minor shortcomings because it closely approximates the average value. However, in the Košice region, they also recorded above-average values and in the years 2008, 2009 and 2018, where the value reached 106.67 points. We can say that in the Košice region, there has been a significant improvement in the quality of life according to our values measured by Index I. relative to the reference period. Average values were also in the regions of Banská Bystrica and Prešov. However, in the Banská Bystrica region,

they also recorded values above 100 points, as opposed to the Prešov region, and in 2008, it was between an above-average and average value at the level of 100.54 points. By contrast, in the Prešov region throughout the period, the value of the index largely oscillated about the same value except for a few changes in 2009, where the index stood at 99.35 points, as well as in 2016 with an index value of 93.59, and in 2018 with a value of 94.30.

3.2. Index II.

The next index is constructed mainly of the social characteristics of the selected regions. Values were analyzed for the entire period 2008–2018 and are shown in Figure 3.

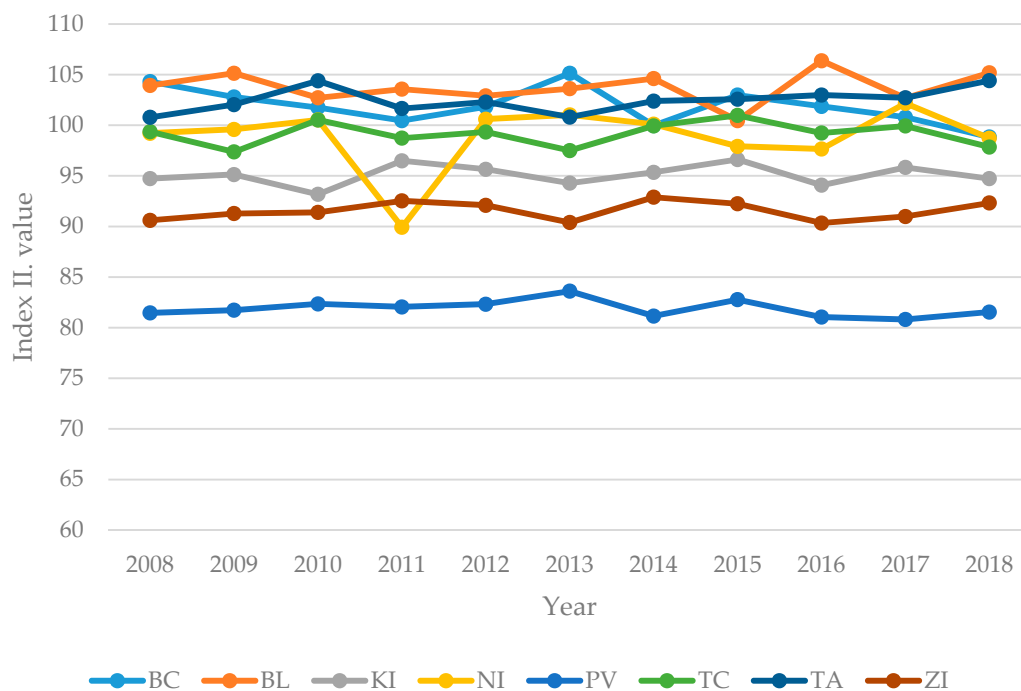


Figure 3. Development of calculated values of Index II. Source: Own processing.

According to Figure 3, it is clear that none of the regions in any two consecutive periods gained a significant change in the value of the index, except for one case; that is, in the Nitra region, where there was a significant decrease in the average up to about 10 points of the index. We can observe above-average values in the Banská Bystrica region, as well as in the Bratislava region, and some above-average values were also recorded in the Trnava region. These above-average values were not recorded as significant, as it was for Index I. The values of the Banská Bystrica region throughout the period showed above-average values, but in 2018, Index II. was slightly below the average level of 98.84 points in the quality of life for the Bratislava region throughout the period, and stood at above-average values without major changes in the index values in the selected period. The values of the Košice region were slightly below average. For the Košice region, we recorded similar values as for Index I., although in Index II., the average value was recorded in the Nitra region and in the Trenčín region. In the Nitra region, the best ratings were from 2010, 2012, 2013 and 2014.

3.3. Index III.

This index was computed from the individual indicators mainly concerned with the environment of citizens. The values for the individual regions are stated in Figure 4.

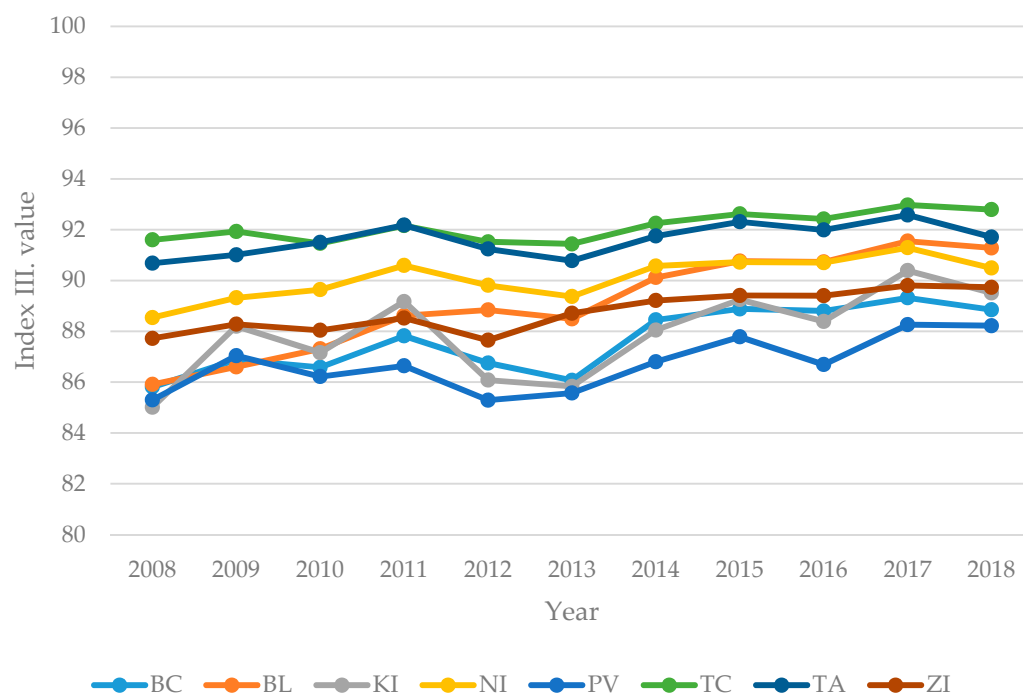


Figure 4. Development of calculated values of Index III. Source: Own processing.

From the data in Figure 4, it is clear that no significant changes in the value of Index III. occurred in any of the regions over any two consecutive periods. This interesting phenomenon was observed in some of the values. The reason that many of these regions reached values above-average or even of average value in the quality of life is due to the indicators that we have chosen for Index III. The best-rated regions, although their levels were below average, were the Trenčín and Trnava regions. The value of Index III. in the Trenčín region oscillated constantly. In the Trnava region, the values were very similar to those in Trenčín. Behind them is placed the Nitra region and Bratislava. The Nitra region reached mostly the same values throughout the period, with the exception of minor fluctuations. Surprisingly, the values are different to that which we measured in the Bratislava region for Indexes I. and II. The Banská Bystrica region is in last place in regard to the comparison with the other regions.

3.4. Quality of Life Index

Finally, we computed the composite Quality of Life Index. During the researched period, there were observed indices of quality of life, and the most favorable values from all the regions of Slovakia were acquired from the Bratislava region. The Bratislava region maintained above-average values throughout the period, where the most significant of which was the value of 123.00 points in 2009. While in 2009, the economic crisis in Slovakia had begun, paradoxically, the Bratislava region reached the highest value Quality of Life Index in this year. Throughout the period, the Bratislava region held the advantage in comparison with the other regions of Slovakia. We have to point out that only in the Bratislava region did the whole period have an above-average index value among the remaining regions, with a few exceptions. Such relatively significant fluctuations in the index were recorded in 2010, compared with 2009, in all regions of Slovakia, and in some of them were 10 points or more. This is due to the economic crisis, but its impact on the index of quality of life is reflected only in 2010 and the subsequent years. As we can see in the Figure 5, after the year 2011, a gradual increase began in the values, with slight variations in these values separated by years, even though it was not the case in all regions.

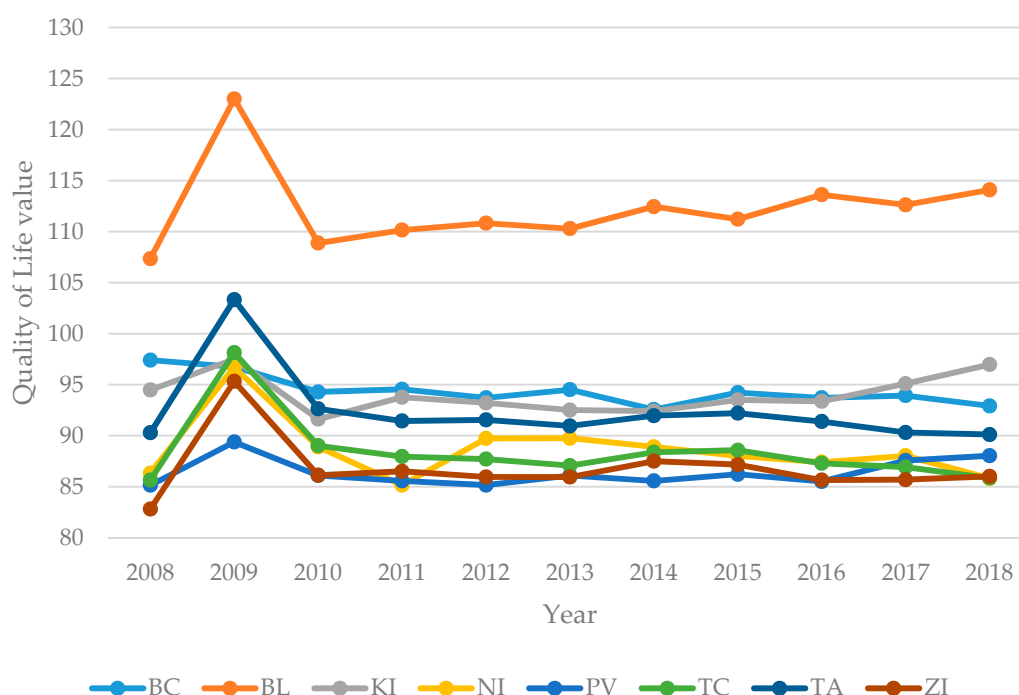


Figure 5. Quality of Life index values in Slovak regions. Source: Own processing.

The level of the quality of life in the Košice region for the whole period was below the 100-point level of the index value. In addition, the most significant change was the change during the times of the economic crisis, i.e., in the period from 2008 to 2010. After 2010, the index largely fluctuated between 92 and 93 points. This change in such relatively constant values occurred only in 2017 and 2018, where the index value in 2017 was 95.094 points, and in 2018, it represented a value of 96.972.

In the Nitra region, the index of quality of life was significantly below the 100-point value. In this region, the index value stood at about 90 points, but in 2009, the index reached 96.683 points, the highest value of the index of quality of life in the Nitra region recorded in the researched period.

The Žilina Region, during the period, reached indexes of quality of life, which were relatively constant, evolving since the values ranged respectively.

During the whole period, the quality of life in the Prešov region was similar to the Nitra and Žilina regions. The values were below average, i.e., below the 100-point value. The value in 2018 reached 88.025, which is almost comparable to the highest value of the Prešov region for the whole period in 2009, 89.37502 points.

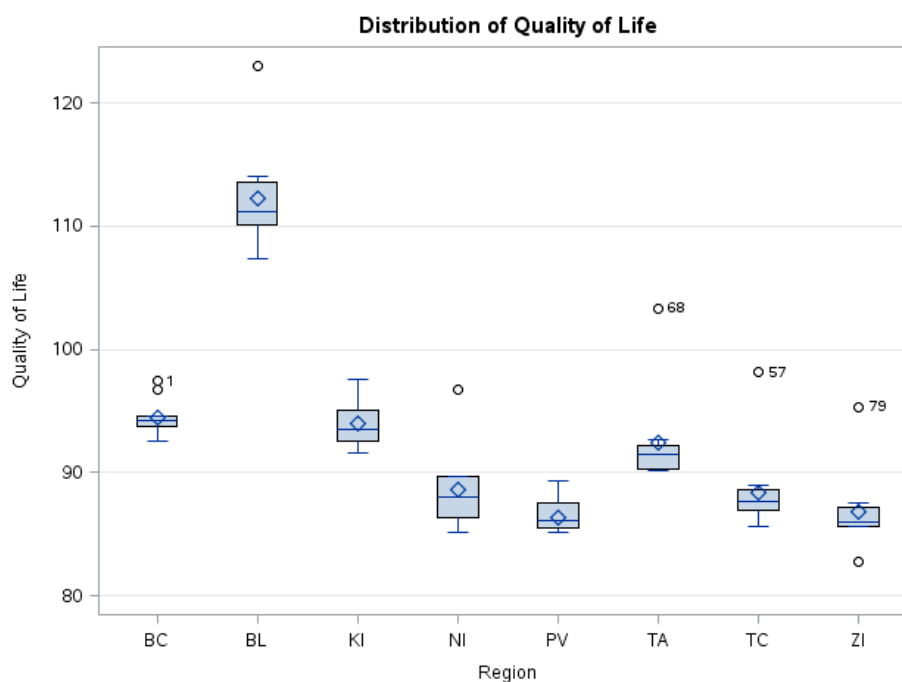
The quality of life observed in Trenčín was quite similar to the quality of life in the Prešov and Žilina regions. The development of the Quality of Life Index in the Banská Bystrica region during the period could be compared to the development of the quality of life in the Košice region, except for the fact that, in the Košice region, we have seen a slow climb in the index values after 2010, although with slight variations from one year, but ultimately we have seen positive changes. Although the Trnava region gained an above-average value of the index at the level of 103.33 points in 2009, in recent years throughout the period, the values were below the average level. The development of the Quality of Life Index is presented in Figure 5.

We have assessed which of the regions are statistically different from others. For this purpose, we used a Bonferroni t-Test. The results are presented in Table 2 and Figure 6.

Table 2. Results of the Bonferroni (–Dunn) t-Test.

Alpha	0.05		
Error Degrees of Freedom	80		
Error Mean Square	8.56608		
Critical Value of t	3.23205		
Minimum Significant Difference	4.0336		
Means with the same letter are not significantly different.			
Bon Grouping	Mean	N	Region
A	112.225	11	BL
B	94.408	11	BC
B	94.038	11	KI
C	92.375	11	TA
C	88.604	11	NI
C	88.409	11	TC
D	86.781	11	ZI
D	86.389	11	PV

Source: Own processing.

**Figure 6.** Box-plot of values of Quality of Life Index Source: Own processing.

Based on the results of the Bonferroni t-Test, we can state that only one region is statistically significantly different (have higher Quality of Life Index values) from all the others, and this is the Bratislava region. The Banská Bystrica region and the Košice region are also better than the other regions, but not better than the Bratislava region.

4. Discussion

The quality of life is a broad problem and, above all, a complex concept. It is very important that this concept is clearly defined, because it is precisely the condition that guarantees the quality of life of the population, which determines the status of the population in these regions and what can be improved in their living conditions. Of course, to assess the quality of life in the regions of Slovakia, it would be necessary to elaborate subjective opinions of the inhabitants of these regions, but it would go beyond the scope of this work. The research was based on statistical data we obtained for the individual regions. We found a comprehensive assessment of the quality of life across the country in the available sources, but focusing on individual regions was challenging, as well as collecting the data for each indicator. The best-rated region of all the regions of Slovakia for the whole period under review was the Bratislava region, which showed above-average values; that is, above the level of the 100-point average. Such a ranking of the Bratislava region is believed to have been caused mainly by its exceptional position in the country. The quality of life in the other regions of Slovakia was just below the 100-point level of the Quality of Life Index for most of the reviewed period, with a few exceptions. The most significant variability in the values of all regions was recorded between 2008 and 2010, where the index values first increased in 2009, compared with 2008, and then subsequently decreased in 2010. After this significant variability, all regions of Slovakia, except the Bratislava region, mostly oscillated around some of the values, which were just below the average of the index of quality of life, and in most regions, we saw a slightly rising character in all of the values of the index of quality of life.

Some findings occurred when researching the indexes in our study. There is significant improvement in the year 2009 and a decline before the year 2009. It is only observable in Index I. and the composite Quality of Life Index. Moreover, it can be observed in most of the regions. This is obviously because of the economic crisis, which starts in Slovakia in 2009. The quality of life was, therefore, influenced before and after the crisis, mainly from economic reasons. As we can see in the development of Indexes II. and III., the influence of the crisis was not evident in terms of social and environmental factors. The Bratislava region is the leading region, in many terms, in Slovakia. It is because most of the industry and services are designated to this region. Although, in terms of social and environmental factors (Indexes II. and III.), there were better performing regions. It is because when there are better economic conditions, it can result in higher prices of living, etc. These disparities were also found in other studies [32]. The performance of the Bratislava region could be mainly influenced by the high GDP per capita, which has been considered as the most influential factor regarding this area of research [37]. One common phenomenon occurred; that is, the western regions tended to have a better quality of life, which was also found in neighboring Poland [27]. We have to mention that there are few studies which have dealt with the quality of life on the subnational level.

5. Conclusions

The main problem related to quality of life, not only in terms of Slovakia, is the regional disparities. If a country has a high Quality of Life Index, it does not have to implicate that every region has the same high standard of living. That is the purpose of measuring regional indices. Exploring and searching for differences in economic and social levels and regional disparities allows one to identify the less developed regions to which regional developments need to be directed. Consequently, it is possible to adapt the economic concepts linking the solutions to the problems related to the economic growth of the concerned region. Such disparities could be as follows:

- Low competitiveness of the production and services in the region;
- Insufficient quality of human resources in the region;
- Insufficient quality of public infrastructure and its accessibility.

We want to contribute to reducing these disparities and activating regional and governmental authorities to ensure the development of these regions as well. Disparities are particularly evident at

the NUTS 3 level. An appropriate active regional policy is the appropriate and necessary use of the available EU resources. These factors could contribute to regional development:

- Development of human potential and effective use of labor in the region;
- Use of innovation, information technologies and processes to better exploit and develop production potential and increase the regional innovation capacity;
- The improvement of infrastructure will improve the accessibility of the regions, the quality of the environment and public services, thus exploiting the natural potential in the regions of Central and Eastern Slovakia, in particular, to improve the use of tourism;
- Improving the position of marginalized groups in the labor market, providing work directly in these regions as these groups, the long-term unemployed, do not want to move to work anymore.

It would be interesting to compare the results of the Quality of Life Index in the regions of Slovakia with the overall development of the Environmental Performance Index (EPI) of the Slovak Republic for the period under review, or with the other regions of the Vysegrad Four countries from the view of sociopolitical and economic aspects [38]. If we can observe a gradual improvement in Slovakia both in the EPI and in the Quality of Life Index, then we can state the interdependence, interconnection and conditionality of the EPI and the Quality of Life Index, with respect to our research results. In the next period, according to the methodology of the EPI's creation, it could be quantified for the individual regions [37,39,40]. The use of these indices is of great importance for the population not only in terms of quality of life but also in economic terms, such as investment in real estate and land. An important area is the protection and creation of the environment, whether on a regional or national level in terms of a given country or, internationally, in terms of global economics. Another possible pathway for future research would be assessing the energy efficiency of regions with Quality of Life Indexes, as some research proves a high correlation between these indicators.

Author Contributions: Conceptualization, J.O., Z.H., R.L. and P.A.; methodology, Z.H.; software, J.O., Z.H.; formal analysis, J.O., Z.H., R.L. and P.A.; methodology, R.L.; data preparation, R.L.; writing—original draft preparation, Z.H. and R.L.; writing—review and editing, J.O., Z.H., R.L., and P.A.; visualization, Z.H. and P.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Kultúrna a edukacná grantová agentúra MŠVVaŠ SR, grant number 026 EU-4/2018. The APC was funded by KEGA 026 EU-4/2018, VEGA 1/0240/20.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Brock, D. Measuring quality of life: Economic, social, and subjective indicators. In *The Quality of Life*; Clarendon Press: Oxford, UK, 1993; pp. 95–132. ISBN 978-0-19-828797-1.
2. Diener, E.; Suh, E. Measuring quality of life: Economic, Social, and Subjective indicators. *Soc. Indic. Res.* **1997**, *40*, 189–216. [[CrossRef](#)]
3. Fiorino, D.J. Explaining national environmental performance: Approaches, evidence, and implications. *Policy Sci.* **2011**, *44*, 367–389. [[CrossRef](#)]
4. Rahman, A.A.; Hasshim, S.A.; Rozali, R. Residents' Preference on Conservation of the Malay Traditional Village in Kampong Morten, Malacca. *Procedia-Soc. Behav. Sci.* **2015**, *202*, 417–423. [[CrossRef](#)]
5. Pienaar, E.F.; Lew, D.K.; Wallmo, K. The importance of survey content: Testing for the context dependency of the New Ecological Paradigm Scale. *Soc. Sci. Res.* **2015**, *51*, 338–349. [[CrossRef](#)]
6. Datta, D.; Chattopadhyay, R.N.; Guha, P. Community based mangrove management: A review on status and sustainability. *J. Environ. Manag.* **2012**, *107*, 84–95. [[CrossRef](#)]
7. Hassan, S.; Olsen, S.B.; Mohammad Afandi, S.H.; Thorsen, B.J. Measuring the Rural and Urban Attitudes towards Wetlands Using the New Ecological Paradigm: Setiu Wetlands, Malaysia. *E-BPJ* **2016**, *1*, 132. [[CrossRef](#)]
8. Stiglitz, J.E.; Sen, A.; Fitoussi, J.-P. *Report by the Commission on the Measurement of Economic Performance and Social Progress*; Commission on the Measurement of Economic Performance and Social Progress: Paris, France, 2009.

9. Dinda, S. A theoretical basis for the environmental Kuznets curve. *Ecological Economics* **2005**, *53*, 403–413. [\[CrossRef\]](#)
10. Bravo, G. The Human Sustainable Development Index: New calculations and a first critical analysis. *Ecol. Indic.* **2014**, *37*, 145–150. [\[CrossRef\]](#)
11. Hsu, A.; Lloyd, A.; Emerson, J.W. What progress have we made since Rio? Results from the 2012 Environmental Performance Index (EPI) and Pilot Trend EPI. *Environ. Sci. Policy* **2013**, *33*, 171–185. [\[CrossRef\]](#)
12. Mohammed, A.; Li, Z.; Olushola Arowolo, A.; Su, H.; Deng, X.; Najmuddin, O.; Zhang, Y. Driving factors of CO2 emissions and nexus with economic growth, development and human health in the Top Ten emitting countries. *Resour. Conserv. Recycl.* **2019**, *148*, 157–169. [\[CrossRef\]](#)
13. Wolsink, M. Contested environmental policy infrastructure: Socio-political acceptance of renewable energy, water, and waste facilities. *Environ. Impact Assess. Rev.* **2010**, *30*, 302–311. [\[CrossRef\]](#)
14. Herrera, L.; Buitrago, R.E.; Lorenzo, O.; Badea, M. Socio-Emotional Intelligence in Colombian Children of Primary Education. An Analysis in Rural and Urban Settings. *Procedia-Soc. Behav. Sci.* **2015**, *203*, 4–10. [\[CrossRef\]](#)
15. Gössling, S. Global environmental consequences of tourism. *Glob. Environ. Chang.* **2002**, *12*, 283–302. [\[CrossRef\]](#)
16. Gladstone, W.; Curley, B.; Shokri, M.R. Environmental impacts of tourism in the Gulf and the Red Sea. *Mar. Pollut. Bull.* **2013**, *72*, 375–388. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Wiedmann, T.; Lenzen, M.; Turner, K.; Barrett, J. Examining the global environmental impact of regional consumption activities—Part 2: Review of input–output models for the assessment of environmental impacts embodied in trade. *Ecol. Econ.* **2007**, *61*, 15–26. [\[CrossRef\]](#)
18. Cracolici, M.F.; Cuffaro, M.; Nijkamp, P. The Measurement of Economic, Social and Environmental Performance of Countries: A Novel Approach. *Soc. Indic. Res.* **2010**, *95*, 339–356. [\[CrossRef\]](#)
19. Kasparian, J.; Rolland, A. OECD's 'Better Life Index': Can any country be well ranked? *J. Appl. Stat.* **2012**, *39*, 2223–2230. [\[CrossRef\]](#)
20. Badrulhisham, N.; Othman, N. Knowledge in Tree Pruning for Sustainable Practices in Urban Setting: Improving Our Quality of Life. *Procedia-Soc. Behav. Sci.* **2016**, *234*, 210–217. [\[CrossRef\]](#)
21. Moser, G. Quality of life and sustainability: Toward person–environment congruity. *J. Environ. Psychol.* **2009**, *29*, 351–357. [\[CrossRef\]](#)
22. Byravan, S.; Ali, M.S.; Ananthakumar, M.R.; Goyal, N.; Kanudia, A.; Ramamurthi, P.V.; Srinivasan, S.; Paladugula, A.L. Quality of life for all: A sustainable development framework for India's climate policy reduces greenhouse gas emissions. *Energy Sustain. Dev.* **2017**, *39*, 48–58. [\[CrossRef\]](#)
23. Tapia-Fonllem, C.; Corral-Verdugo, V.; Fraijo-Sing, B. Sustainable Behavior and Quality of Life. In *Handbook of Environmental Psychology and Quality of Life Research*; Fleury-Bahi, G., Pol, E., Navarro, O., Eds.; International Handbooks of Quality-of-Life; Springer International Publishing: Cham, Switzerland, 2017; pp. 173–184. ISBN 978-3-319-31414-3.
24. Murakami, F.; Sulzbach, A.; Pereira, G.M.; Borchardt, M.; Sellitto, M.A. How the Brazilian government can use public policies to induce recycling and still save money? *J. Clean. Prod.* **2015**, *96*, 94–101. [\[CrossRef\]](#)
25. Rozenberg, A.G. Factors of Quality of Life of the Population: Research and Discussion. In Proceedings of the International Scientific Conference "Global Challenges and Prospects of the Modern Economic Development", Samara State University of Economics, Samara, Russia, 7–8 November 2019; 2019; pp. 1498–1504.
26. Šoltés, V.; Nováková, B. Measurement of Objective life Quality in the Context of Economically Developed Countries' Quantification. *Procedia Econ. Financ.* **2015**, *32*, 146–153. [\[CrossRef\]](#)
27. Nowak, P. Regional variety in quality of life in Poland. *OC* **2018**, *9*, 381–401. [\[CrossRef\]](#)
28. Yonk, R.M.; Smith, J.T.; Wardle, A.R. Building a Quality of Life Index. In *Quality of Life and Quality of Working Life*; Boas, A.A.V., Ed.; IntechOpen: London, UK, 2017; ISBN 978-953-51-3445-9.
29. Yonk, R.M.; Smith, J.T. Exploring the Components of Our Quality of Life Index. In *Politics and Quality of Life*; SpringerBriefs in Political Science; Springer International Publishing: Cham, Switzerland, 2018; pp. 17–34. ISBN 978-3-319-72570-3.
30. Mederly, P.; Topercer, J.; Nováček, P. *Indikátory Kvality Života A Udržitelného Rozvoje: Kvantitativní, Vícerozměrný a Variantní Přístup*, 1st ed.; UK FSV CESES: Praha, Czech Republic, 2004; ISBN 80-239-4389-8.

31. Mederly, P.; Novacek, P.; Topercer, J. Sustainable development assessment: Quality and sustainability of life indicators at global, national and regional level. *Foresight* **2003**, *5*, 42–49. [CrossRef]
32. Abdul Mohit, M. Analysis of Malaysian Regional Quality-of-Life and its Policy Implications. *AjQoL* **2018**, *3*, 11. [CrossRef]
33. Petrova, E. Regional Life Quality Management: Methodological Approaches to its Forecasting using Neural Networks. In Proceedings of the International Scientific Conference “Competitive, Sustainable and Secure Development of the Regional Economy: Response to Global Challenges” (CSSDRE 2018), Limassol, Cyprus, 18–20 April 2018; Atlantis Press: Volograd, Russia, 2018.
34. Štatistický úrad SR STATdat. Public database. Available online: http://statdat.statistics.sk/cognosext/cgi-bin/cognos.cgi?b_action=xts.run&m=portal/cc.xts&gohome= (accessed on 20 September 2019).
35. Macháček, J.; Toth, P.; Wokoun, R. *Regionální a Municipální Ekonomie*; Oeconomica: Praha, Czech Republic, 2011; ISBN 978-80-245-1836-7.
36. European Union. *Final Report of the Expert Group on Quality of Life Indicators*; Publications Office of the European Union: Luxembourg, 2017; ISBN 978-92-79-66085-6.
37. Liu, B.; Matsushima, J. Annual changes in energy quality and quality of life: A cross-national study of 29 OECD and 37 non-OECD countries. *Energy Rep.* **2019**, *5*, 1354–1364. [CrossRef]
38. Almeida, T.A.; Das, N.; García-Sánchez, I.-M. Sociopolitical and economic elements to explain the environmental performance of countries. *Environ. Sci. Pollut. Res.* **2017**, *24*, 3006–3026. [CrossRef] [PubMed]
39. Lambert, J.G.; Hall, C.A.S.; Balogh, S.; Gupta, A.; Arnold, M. Energy, EROI and quality of life. *Energy Policy* **2014**, *64*, 153–167. [CrossRef]
40. Nadimi, R.; Tokimatsu, K. Modeling of quality of life in terms of energy and electricity consumption. *Appl. Energy* **2018**, *212*, 1282–1294. [CrossRef]



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).