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Quantitative Analysis and Modelling of the Factors That Determine the Quality of Life in the City Council of Chile

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ABSTRACT

This research tries to determine what factors influence the well-being of various communities and city council in Chile, based on urban national life quality indicators, the above carried out for communes that are close to the threshold of 50,000 inhabitants, which represents close to 100 communes of the country, reaching approximately 80% of the population. To measure efficiency, an econometric model is developed with a series of variables that explain the levels of well-being, as well as to also find measures of significance and importance in the relationship structure, in order to understand the sensitivity of some factors in the national well-being and quality of life.

Keywords: Quality of life, Efficiency, Stochastic frontier analysis, Econometric modelling, Urban well-being

INTRODUCTION

Municipalities and communities are an element that, as a whole, form a nation or state, having these, in their structures, a certain independence and autonomy with respect to the central government, the main focus pursued by local governments or municipalities, is to watch over the interests, needs and problems faced by the citizens of a particular geographical area, understanding that, due to the diversity and geography of a nation, not all its citizens will find the same needs in your day to day (List and Sturm, 2006).

It is becoming more and more necessary to be more precise in the evaluations and designs of solutions to people's problems, the targeting and optimization of resources must be carried out intelligently, understanding that these resources are limited and increasingly scarce, and that they play a fundamental role in the well-being of the citizenry in general. At the same time that it is required to work on precise solutions, it is also it is necessary to improve the ways of understanding the problems of the community, for this reason instruments are designed that serve as tools that evaluate gaps and allow the generation of policies that cover said gaps almost perfectly (Hasnain et al., 2005).

One way to assess gaps and problems that afflict communities is to perform well-being measurements in various dimensions, considering the spectrum of contexts in which a person operates in their daily lives, in this way we can, in addition to understanding differences between regions and geographical areas, define policies according to the most urgent problems of each sector, an example of which is the measurements through the Urban Life Quality Indicators that are carried out annually in the country (Kjersti et al., 2018).

Chile is a nation with a strong centralist tendency, this is due to the fact that, in part, it has a centralized political power, which is the equivalent of saying that everything ends in its capital, with a bias in territorial terms that is why, in addition to the above, it is they require decentralization policies that positively impact the regions, including them in national decisions and in the design of policies and projects that seek improvements in the welfare of the nation.

The main objective of this study is to determine which factors influence the well-being of the various communities and municipalities of Chile, based on Indicators of National Quality of Urban Life, the above carried out for communes that are close to the threshold of 50,000 inhabitants, which represents nearly 100 communes in the country, reaching 80% of the population. on approximately. For the measurement of efficiency, an econometric model is developed with a series of variables that explain the levels of well-being, as well as to also find measures of significance and importance in the structure of relationships, in order to understand the sensitivity of some factors in the welfare and quality of national life.

THEORETICAL FRAMEWORK

Urban Quality of Life and Well-being is a concept that, over time, has gained increasing attention in a wide range of contexts, finding related studies in fields such as international development, health care, education on, recreation and others related to social interactions in communities. Studies of this style have an impact on development policies, growth, and especially on intelligent planning in urban environments, considering locations and forms of effective and efficient distribution according to specific problems and needs (Bowler et al., 2010).

People are beings that live in society and community, we are governed by a series of rules and restrictions according to social structures and limitations that we put, for this reason, despite being free entities, we are governed by a regulation that proposes order to the operation and activate. The government and its agents form, as a whole, an entity that looks after the needs of people in a society, seeking solutions to problems that society suffers in a given period and geographical area, such solutions or policies they delimit the actions and impact on the behaviour and freedoms that citizens have in the community, thus affecting their relationships and quality of life, this mainly due to the fact that said policies affect employment, health, education, dispersion on and day-to-day decisions, basic elements with which a person interacts during any stage of their development (Giannico et al., 2021).

The quality of life is a subjective concept for sure, the satisfaction in our daily lives and the perceptions that we may have of ourselves in our community and towards others are subjective components that depend on internal factors and personal, the definitions can fall into different evaluations and appreciations without clear convergence or solid answer. Despite the above, there is a logical association between satisfaction with ourselves and with our daily life, and how we feel regarding aspects such as physical and mental health (Rubilar et al., 2022).

For the year 1962 Abraham Maslow published his book associated with personal psychology called The Self-Actualized Man: Toward a Psychology of Being, a book that took as its starting point concepts previously introduced and studied in The Theory of Human Motivation (A Theory of Human Motivation), establishing the bases of the theory of quality of life, based on studies carried out on people that Maslow considered self-performing, such as Albert Einstein or Eleanor Roosevelt, in addition to studies in people who could be considered within healthy segments of the population, such as students with high academic performance. The main basis that Maslow expounds is that personal perceptions in terms of quality depend on feelings of self-realization and personal growth, the fact of taking responsibility for our actions and becoming actors in our day-to-day life, having freedom of action and decision, and living in productive development environments make human beings happier, more powerful, free and healthy (Maslow 1964).

Studies and measurements of quality of life are reported in various regions of the world through different organizations and entities that focus on studying this variable. In Europe, the University of Brescia in Italy, carries out an annual study carried out through a survey that is applied to citizens of 83 countries that make up the European Union, adding others from the European Association Free Trade Association (EFTA), United Kingdom, some of the Balkan Peninsula and Turkey (Celemín and Velásquez, 2018).

Starting in 2010, the Chilean Chamber of Construction (CChC) and the UC Institute of Urban and Territorial Studies developed an Urban Life Quality Index (ICVU), considering various aspects and elements of various areas. of the country, whose main objective is to look for opportunities and deficiencies in the perception of the quality of life of citizens in various communes of the country, functioning as a tool that contributes to the development, design and implementation of projects and policies that are consistent with the ailments of Chilean citizens.

In the words of its author, the ICVU considers dimensions such as Labor Conditions, Labor Opportunities, Sociocultural Conditions, Mobility, Health, Environment, Housing, Urbanism and Connectivity, some variables that consider the dimensions in question are the % of Tax-Exempt Land, % of Common Fund Dependence, Employment and Business Opportunities, Investment Opportunities, Precariousness of Housing, Conditions of Public Spaces, Level of Insecurity in Sectors, Real Estate Development, Public and Private Services, among others.

The results for 2021 show that close to 44% of commune consultations, corresponding to approximately 4.7 million inhabitants, have a low level of perception of quality of life. In evolutionary terms, the ICVU has presented

increases in the last eleven years, going from the order of 43 to 45 points (years 2011 to 2014) to approximately 50 points (last three years), providing a compound annual growth rate of 1.38% between the years 2011 and 2021. It is possible to appreciate increases in the proportion of communes that show an ICVU at a high level, especially in the last four years of evaluation. For all cases, the sample of communes studied is of the order of 90 to 99 communes, which vary according to the growth and demographic movements of the sectors, in addition to other factors such as development and urbanization, which allows communes that were not on the evaluated list, to enter the study category.

Despite the increases in the results that the ICVU has had in the years studied, the results cannot be considered good in their entirety, close to 60% of the communes surveyed have medium low or right perception levels. We must consider that the country and the world have gone through a series of winds and events that have diminished the quality of life and the daily routine to which we have been accustomed for years, the pandemic and COVID-10, mobility restrictions and quarantines, the social outbreak of 2019, international conflicts and poor conditions in various aspects have changed the perceptions of citizens' lives in recent years.

The measurement of this indicator is a diverse topic, the factors that affect the quality of life are components of elements corresponding to different areas that involve the daily life of a person, some studies evaluate this indicator according to socioeconomic factors. economics and policies related to people's health. Puertas R. et al. (2020) evaluate the quality of life of 23 European cities considering a series of variables from various sources, finding lifestyle factors such as Alcohol Consumption, Education, Happiness and Satisfaction, in terms of socioeconomic factors we find GDP per Capita, Age, Working Life, and in terms of public policies we have Expenditure Public and Environmental Investment. Macke, Casagrande et al. (2018) consider a series of variables in the measurement and explanation of the quality of life in the city of Curitiba in southern Brazil, considering socio-structural variables such as themes Safety, Perception of Efficiency in Public Services, Satisfaction with Urban Development, Environmental Factors, Use of Green Areas, Cleanliness in the City, Air Quality, and others related to economic and environmental factors like Finance at Home, Labor Confidence, Confidence in Neighbors, among others. Somarriba N. and Zarszosa P. (2019) carried out a study in 28 countries of the European Union in order to find explanatory variables that relate the behavior of quality of life indicators by country, considering factors such as Gender, Age, Marital Situation, Children, Household Size, Wages and Working Life, Education, Perception of Corruption, Infant Mortality, among others. In Pakistan, a study conducted by Fahad L. et al. (2019) measures quality of life indicators in 52 counties in the city of Abbottabadm using a measurement instrument developed by the World Health Organization, considering demographic variables. factors such as the type of Family Nucleus, Types of Residence, Distribution by Sex, Distribution by Age, Own Residence, Marital Status, Educational Level, Illnesses, Employment Ratios and characterizations by Socioeconomic Group, Debt, between others.

From the above we can appreciate the variety of ways to analyse and study the problem of measuring quality of life, the results depend on the form and edges of evaluation, although there are common components between the studies, especially in terms of Employment, Education and Development that are independent of the analyst and of the area in which the research is carried out.

METHODOLOGY

The database for the investigation is made up of those communes that are close to the threshold of 50,000 inhabitants under certain conditions of development, there being communes that, although they do not meet this criterion, in terms of capabilities come into in the analysis, the above corresponds to a total of 99 communes in the country, involving all the regions that make up the national territory, in communal terms this represents about 29% of the 346 communes in the country, involving about 80% of the population, the above due to the fact that they are communes with the highest demographic concentration due to their characteristics of development and attraction of inhabitants.

The phenomenon to be studied corresponds to the Quality of Urban Life, which is defined, according to the criteria of the Chilean Chamber of Construction and the Nucleus of Municipal Studies as a measurement of the conditions of objective life of the population generated by actions and dynamics of transformations of urban spaces, induced by public and private agents and civil society or citizens themselves, which corresponds to studying how the parts that make up an urban and social system interact, and how it affects the perception of well-being on a day-to-day basis.

The measurement of our response variable (Quality of Urban Life) is carried out by integrating and interacting 20 communal characteristics (variables), this through characterizations of the area, indicators of various kinds, or others related to the commune in question, the data sources are diverse and correspond to reports provided by the Library of the National Congress of the Republic, Institute of Statistics, Ministry of Development Urban and the Centre for Studies and Analysis of Crime, in addition to other public reports such as the results of the Casen Survey.

It is worth mentioning that some variables are used in the way they come from the community reports provided by the reports, and others are built from the interaction between variables, such as Density, Green Area per Habitant, % of Students who obtain over 450 PDT Points and Inhabitants by Health Establishment.

The identification of the final model is carried out using iterative methods, specifically with Stepwise Regression through Forward, Backward and Stepwise iterations (mixture of Forward and Backward). All the regressions are significant according to the Fisher criterion with all the p-values less than 0.05, the adjusted coefficients of determination (r2) vary between 86.0% and 84.5%, taking the BIC criterion the smallest of the models studied. In terms of errors, the lowest error coefficients, in terms of Mean Absolute Percentage Error (MAPE) and Mean Square Error (MSE), the lowest meet the AIC criterion (Clark et al., 2019).

With the previous results, we proceed to work with the model identified by means of the Backward criterion under AIC, thus, all the variables are significant at 5% significance, the statistic Fisher's test of 76.22 yields a p-value ≤ 0.05, so the model is significant for the problem in question, in addition the r2 multiple is 87.14% and the adjusted r2 is 86, 0%. The model errors show some symmetry at their extremes, with a minimum of -6.4873, a maximum of 6.436 and a median of -0.3186 (Paz et al., 2016).

The results when analysing the Inflation Factors of Variance and Tolerance, in the case of VIFs all show values less than 5, with the acceptance threshold for this indicator of VIF being ≤ 10, from the above we can to find authors in the literature who suggest VIF thresholds ≤ 5, for both cases it is true that there are no problems with a maximum VIF of approximately 4. The tolerances (TOLs) are all greater than 0.1, the criteria being considered as TOL ≥ 0.1, finding cases with TOL ≥ 0.2. With the above, it is established that the model does not have a collinearity problem between the selected variables (Coughenour et al., 2016).

RESULTS

The results of the Quality of Life Index in Chile are heterogeneous, and demonstrate the different and diverse realities that can be found throughout the country, their differences between minimums and maximums of nearly double (communities with 39 points and others with approximately 80 points) show this phenomenon.

The study presented considers variables of a diverse nature, responding to the fact that the factors that interact with Quality of Life are diverse, finding groups such as Demographic and Sociodemographic characteristics, Investment and Municipal Expenditure, Character Community Statistics, Education, Health, Violence and Daily Living, the above responding to the way in which this indicator is evaluated and constructed according to criteria estimated by the Chilean Chamber of Construction and the group of Researchers who carry out the analysis and its publication, leaving out what is the analysis by individual characteristics and its significance and impact on the final result.

The analysis has a total of 20 variables that try to explain the Quality of Urban Life, variables that, as mentioned above, are from different areas and groups that try to capture the behaviour of the phenomenon. The estimated final model Once the stepwise process has been carried out, it leaves a total of eight variables that explain about 86% of the variability of the Quality of Life, without major collinearity problems that alter the results of the parameter estimates of the model.

The results present mixed effects for the response variable, it is shown how the % of Communal Overcrowding and the participation in the Municipal Common Fund have negative or inverse relationships with the Quality of Life. The Municipal Common Fund is another variable that responds inversely to Quality of Life, although studies that relate investment and municipal spending show how public spending and policies in favour of the population 'on have a causal effect on the good live, this type of Fund responds to other

endogenous variables that explain the behavior, if we look at the communes that have the lowest levels of participation in the Municipal Common Fund we find communes such as Vitacura, Providencia, Las Condes, Lo Barnechea or Puerto Varas, communes that, with the exception of the last mentioned, are in the Metropolitan Region and have the largest number of companies and industries located in their dependencies, so they do not have the need to depend of this Fund, the foregoing responds in turn to the fact that their communes have better levels of employability and greater resources derived from what trade and the market generate in the mentioned areas.

The Permanent Own Income explains, in part, the opposite of what the Municipal Common Fund explains, if the latter shows how it is related to less industrialization and economic activity in the area, the Own Income works the other way around of this, and thus, the communes that had the least participation in the Fund are those with the greatest amount of Own Income, we are talking about communes such as Las Condes, Lo Barnechea, Providencia or Vitacura, communes that in turn have the highest levels of Quality of Life. For their part, Social and Internal Expenses, variables related to Municipal Investment, show direct or positive behaviors with Quality of Life.

One of the variables that most affects the Quality of Life is the % of Students who obtain over 450 points in the PDT, this variable is closely related to schooling and community study levels, representing both those who they graduate from high school and finish their compulsory education stage, together with presenting the aspirations of the population when taking the test in order to pursue higher studies of any kind. On the other hand, the Green Areas per Inhabitant provide direct - positive relationships with the Quality of Life.

CONCLUSION

The variables and factors that affect the Quality of Life are varied and its multiple factors, human interactions and the environment influence the sensations of well-being of the participants of a society and community, the policies that are generated in a region over a population should go after seeking to reduce the ailments suffered by the cohabitants, or at least reduce the gaps to reach what can be considered a healthy and propitious environment for the good development and well-being of the community citizenship.

The measurements and ways in which various professionals and specialists who focus their efforts on explaining and understanding quality of life are varied and depend on the approach that one wishes to give to the study, although it is possible to appreciate how some characteristics are repeated between studies, such as This is the case of Climate Indicators, Pollution, Health Conditions, Safety, Education, Violence or Employability, variables that tend to be related to what is considered for a full person in terms of their individual and collective needs and aspirations.

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