

Original Research Article

Economic determinants of residents' quality of life

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Abstract: Using the 2014-2023 dataset from the National Bureau of Statistics of China, this paper studies the influence of economic factors on the quality of life. Although there are some previous studies, the collective impact of additional economic factors, such as tax revenue, year-end total population, and the economic environment, on the level of life quality has not been studied. Based on the above reasons, we will construct linear regression models to investigate how these economic factors affect people's quality of life. To make sure that the dataset is accurate and complete, we have conducted online research to obtain the missing data for 2023. The models we have developed show that the economic environment and GDP jointly affect residents' disposable income, and GDP is positively correlated with per capita consumption expenditure. The study also found that taxes, population size and the economy all affect the amount of energy used per person.

Keywords: economic factors; quality of life; linear regression model

1. Introduction

Economic development and its effect on the quality of life have been subjects of many studies and public interest. The measurement of the quality of life is a very broad problem that includes access to housing and social services, as well as intangible factors such as one's own well-being and happiness. Therefore, the problems in the economy and the quality of life of the people have attracted the attention of scholars. Although previous studies have examined the effect of some economic factors on the quality of life and measured it in various ways, the collective influence of additional economic factors, such as taxation, year-end total population, and the economic environment, on the level of life quality has not been studied. Based on the previous studies of all kinds of economic factors affecting the quality of life, the current study will explore how the economy affects the quality of life by examining in detail how the economic environment and GDP influence residents' per capita disposable income, how GDP affects per capita consumption expenditure, and how taxes, year-end total population and the economic environment impact per capita energy consumption. By sorting out the relevant factor data from the National Bureau of Statistics of China and comparing the significance of the influence of different economic factors on the factors reflecting the quality of life, this research aims to study the impact of the economy on the quality of life.

2. Background literature

Although there are few studies that directly investigate the complex relationships among economic indicators and quality of life compared with other social phenomena, a large number of studies have examined economic factors and how they compare to other determinants of well-being. Theories of economic effect differ greatly. Therefore, it is beneficial for the progress of this study to examine the impact of all kinds of economic factors on all kinds of indicators of living standards.

3. The economic multifaceted influences on population health

McCartney et al. (2019) undertook "a systematic review of reviews" searching eleven databases and gray literature, and concluded that "countries with social democratic regimes, higher public spending, and lower income inequalities have populations with better health" (p. e1). Hamoudi and Dowd (2014) have studied older Americans; Caverio et al. (2022) have studied the people of Lima; Andreu et al. (2023) have studied cancer survivors. Hamoudi and Dowd used data from the Health and Retirement Study (HRS) and housing valuations by DataQuick to find that fluctuations in the housing market can harm the psychological

and cognitive health of older Americans. Cavero and others have also conducted a secondary analysis of the "Lima Cómo Vamos" survey to find that poor public services and urban conditions have negatively affected the quality of life and health of the people in Lima. Andreu and others used the QLACS scale to determine the health-related quality of life (HRQOL) of cancer survivors and found that employment status is positively correlated with HRQOL. Norström and others (2014) have classified the effects of unemployment on health by age, sex and marital status in a systematic way.

4. The economic multifaceted influences on welfare

Aktas (2022) used panel data analysis to find that, in the long run, the effect of human development and public governance on economic welfare in transition economies is positive but varies among these countries. El-Jahel, MacCulloch and Shafiee (2023) used data on life evaluation and emotional well-being to show that unemployment and inflation reduce well-being in all these aspects, and the effect of unemployment was especially strong. Li, Zhang and Gan (2024) analysed balanced panel data at the provincial level in China from 2009 to 2017 and found that an orderly residential land structure is favourable for the quality of life of the people. For the Vietnamese transition context, Trinh (2026) reported that "enterprise expansion is associated with improved income distribution and greater female employment", yet welfare impacts are conditioned by local institutional environments.

5. The environment multifaceted influences on life quality

Revich (2018) has investigated the environmental indicators in some large Russian cities, such as Moscow, and found that urban heat island effect, temperature fluctuations and traffic noise pollution all harm the health of the population, especially older people. Lai and others (2016) interviewed 211 informal caregivers and 402 self-care adults aged 45 and over. Exploratory and confirmatory factor analyses were carried out to find the eight attributes of the World Health Organization's guidelines and construct a structural equation model. Based on the above analysis, transportation and housing, community support and health services, outdoor spaces and buildings are all positively correlated with active aging.

6. The current study

The purpose of this paper is to examine the combined effect of the economic environment and GDP per capita on the disposable income of the population. The problem is to know how the two factors will work together to affect the economic life of the people.

Second, we wished to know whether there is a different pattern of spending among people at different levels of economic development, as shown by GDP per capita. Some studies have previously investigated the relationship between GDP per capita and consumption behaviour, but the exact mechanisms of this relationship have not been clarified. Therefore, the purpose of this paper is to investigate how the economic level of the country, reflected in GDP per capita, affects people's consumption patterns. Thus, it will be possible to determine how much the GDP per capita reflects the level of living standards for the people and how this, in turn, affects their consumption.

In addition, we also wanted to study the combined effect of taxes, year-end total population, and the economic environment on per capita energy consumption. We wish to study the impact of economic policies and environmental factors on per capita energy consumption and how these factors affect people's energy use. Although some studies have previously explored the relationship among economic factors and energy consumption, the impact of taxes, population size, environmental conditions, etc., at the individual level has not been fully investigated in the literature (Shi et al., 2021). Therefore, in the present study, we aim to determine whether the sensitivity of people's awareness of per capita energy consumption is affected by the implementation of taxes, year-end total population, and the economic environment. In this way, it may be possible to evaluate the extent to which the specific measures of association used in previous studies have shaped our understanding of these complex interactions. We explored the following research questions for this study:

- (1) To what extent does the economic environment and GDP per capita jointly influence the disposable income of residents?
- (2) To what extent does GDP per capita affect per capita consumption expenditure?
- (3) To what extent do taxes, year-end total population, and economic environment interact to influence per capita energy consumption?

7. Method

7.1. Materials

We obtained the data for this study from the National Bureau of Statistics of China over the period of 2014 to 2023. The purpose of this paper is to study how changes in the economy affect the lives of ordinary people. According to the official database, we have obtained the following data: Year-end total population in ten thousand people, taxes in billions of yuan (RMB), residents' per capita consumption in yuan (RMB), per capita energy consumption in kilograms of standard coal, and residents' per capita disposable income in yuan (RMB).

7.2. Procedures

Read the data in the statistics program and then analysed it. At this time, it was discovered that the data for per capita energy consumption in 2023 was missing. Therefore, I have used Google to carry out an online search for relevant data in 2023 and have found some. A reliable source has been used to obtain the actual data point for per capita energy consumption in 2023, so the dataset will be accurate and continuous. In addition, for the sake of uniformity and simplicity, the decimal point in disposable income has been rounded to the nearest integer.

7.3. Tools

Prepare the data and then use a computer to construct the three linear regression models that will be employed to investigate the impact of economic indicators on the quality of life of residents. Linear regression analysis was used to examine the effect of independent variables (economic indicators) on the dependent variable (quality of life indicators).

8. Result

We have successively added the independent variables of each dependent variable to construct 15 linear regression models. The AIC is a measure of model fit. We have also added interaction terms in the two models to investigate the effect of interaction. Finally, three good choices were selected.

To find the answers to the above questions, we constructed three linear regression models using the Im() package in R.

8.1. The impact of the economic environment and GDP on per capita disposable income of residents

Table 1. Product and year combined effects on income.

Source	Estimate	Std.Error	t value	Pr(> t)	
(Intercept)	-2.597e+06	4.494e+05	-5.779	0.000678	***
Year	1.296e+03	2.241e+02	5.782	0.000676	***
Product	1.186e-02	3.124e-03	3.795	0.006759	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

Data source: National Bureau of Statistics of China, dataset for 2014-2023.

Mode 1 is used to represent income as the dependent variable. Year and Product were taken as independent variables. Analysis of the linear regression model for the relationship between year, product and income shows that the entire model explained 99.94% of the variance (conditional R^2) and the fixed effects accounted for 99.92% of the variance (marginal R^2). As shown in **Table 1**, both year ($b = 1296$, $SE = 224.1$, $t = 5.782$, $p < 0.001$) and product ($b = 0.01186$, $SE = 0.00312$, $t = 3.795$, $p = 0.006759$) have significant main effects on the per capita disposable income of residents. Therefore, both the number of years and the category of products are relatively high. The effect size for year is 1296 and for product is 0.01186; each unit increase will lead to the corresponding change in average income, all else being equal. There was no interaction between year and product either ($p > 0.05$).

8.2. The impact of GDP on per capita consumption expenditure

Table 2. Product impact on disburse.

Source	Estimate	Std.Error	t value	Pr(> t)	
(Intercept)	2.935e+03	6.177e+02	4.752	0.00144	**
Product	1.846e-02	6.389e-04	28.890	2.23e-09	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

Data source: National Bureau of Statistics of China, dataset for 2014-2023.

In mode 2, disburse is taken as the dependent variable and product as the independent variable, and the linear regression model shows that it can explain about 99.05% of the variation (conditional R^2) and about 98.93% of the variation (marginal R^2). As shown in **Table 2**, the main effect of product is significant ($b = 0.01846$, $SE = 0.00639$, $t = 28.890$, $p < 0.001$), and it affects the level of disbursement. That is to say, for every unit increase in the product category or score, the average increase in disbursement is 0.01846 after controlling for other factors.

8.3. Effects of taxes, year-end total population, and economic environment on per capita energy consumption

Table 3. Combined effects of tax, population, and year on energy.

Source	Estimate	Std.Error	t value	Pr(> t)	
(Intercept)	-2.319e+05	1.200e+04	-19.329	1.24e-06	***
Tax	4.311e-03	9.608e-04	4.487	0.00416	**
People	-1.353e-01	8.901e-03	-15.197	5.12e-06	***
Year	1.257e+02	6.061e+00	20.738	8.18e-07	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

Data source: National Bureau of Statistics of China, dataset for 2014-2023.

For which mode 3, energy was seen as the dependent variable. Tax, population and year were seen as independent variables. Analysis with a linear regression model of the effect of tax, people and year on energy shows that the entire model explains 99.87% of the variance (conditional R^2) and the fixed effects account for 99.8% of the variance (marginal R^2). As shown in **Table 3**, there are three significant main effects for tax ($b = 0.00431$, $SE = 0.00096$, $t = 4.487$, $p = 0.00416$), people ($b = -0.1353$, $SE = 0.00890$, $t = -15.197$, $p = 5.12e-06$) and year ($b = 125.7$, $SE = 6.061$, $t = 20.738$, $p = 8.18e-07$) on the level of disbursement; that is, changes in these factors have led to significant changes in disbursements. A unit increase in the tax will increase disbursements by about 0.00431 units, and a similar increase in the year will lead to a rise of 125.7 units. On the other hand, as the number of people increases, expenditure falls by 0.1353 units, all else being equal.

9. Discussion

9.1. The joint influence of economic environment and GDP on disposable income

The study reveals a significant positive correlation between the combined effects of the economic environment and GDP on disposable income. As McCartney et al. (2019) have shown, broader economic-political conditions jointly shape residents' material welfare; in line with the general consensus in economic research, good economic conditions and a high GDP are generally associated with higher incomes for individuals. Such cross-national heterogeneity in economic-welfare links is also documented by Aktas (2022). This paper will explore how changes in the economic environment and GDP affect the disposable income of the population together to add another layer of detail to this field.

9.2. The impact of GDP on per capita consumption expenditure

Based on the above analysis, it can be concluded that GDP per capita has a substantial positive effect on per capita consumption expenditure. The first is to directly investigate the connection between GDP per capita and consumption expenditure, thus providing support for the economic theory that income is a primary motive for consumption. By showing that GDP is related to consumption, this paper provides some empirical support for the idea that economic development leads to increased consumption.

9.3. The joint effects of taxes, population, and economic environment on energy consumption

Based on the above analysis, it has been determined that taxes, year-end total population and the economic environment jointly affect per capita energy consumption, and their interaction is not trivial. In recent years, various studies have been carried out to explore how different aspects of economic and demographic changes affect energy consumption, and these findings will be extended in this paper. As Trinh (2026) highlighted, "welfare consequences depend on the interaction between organizational forms, labor market participation, and institutional conditions" (p.33). Meanwhile, McCartney et al. (2019) stressed, "Politics, economics, and public policy are important determinants of population health" (p. e1). Based on the combined impact of taxes, population and economic conditions, this paper offers a new view on the study of energy consumption. Therefore, in the design of energy policies, these factors should be considered together to reduce energy consumption and pollution. The results do not consider only one factor but also

the combined effect of tax, economic environment and demographic changes on energy consumption.

10. Conclusion

This study investigates the influence of economic factors on residents' quality of life indicators. It analyzes data from China's National Bureau of Statistics (2014-2023) and employs linear regression models to address three key issues: The joint effect of economic environment and GDP on per capita disposable income, the impact of GDP on per capita consumption expenditure, and the combined influence of taxes, year-end population, and economic environment on per capita energy consumption. The results will expand the theoretical system of economic growth, consumption theory and energy economics, offer empirical support for economic theories, and provide policy suggestions for the government in the areas of economy, consumption and energy.

In future research, we will add more indicators of the quality of life that are affected by economic factors, study how different regions and groups in society are impacted by the economy, and put forward more targeted policies. The current study is limited by a single source of data and may have missed some relevant factors. Although the linear regression model can show the relationship among variables, it may fail to reflect all the changes in the economy. In the future, multi-country data, various databases and other models will be employed to study the problems of economic data more broadly.

About the author

Zhiqi Liu(2004-), female, a native of Jining, Shandong Province, China, is currently an undergraduate student whose research interests encompass financial management and economics.

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