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The determinants of subjective well-being: An assessment for Russian cities based on new data

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Happiness is what people always seek. In recent decades, there has been a desire to measure happiness and understand what influences it, considering the place of residence. Given the increasing global importance of cities and their role in Russian state policy to improve quality of life, it is crucial to understand the factors that influence citizens' subjective well-being. This research aims to study the impact of social, economic, environmental, and urban factors on the subjective well-being of residents in Russian cities. To achieve this goal, we reviewed empirical studies focused on the influence of various factors on subjective well-being. Then we used a dataset published for the first-time on VEB.RF platform. Related data characterize the quality of life in 115 cities in Russia. We justify the use of a double log multiple regression model to identify the domains of subjective well-being. The calculations show that satisfaction with cultural life, safety, environmental conditions, and beautification of urban areas are the most significant determinants. It was found that city size does not affect subjective well-being determinants. Aligning government and municipal policies to key well-being domains can attract citizens and support sustainable development by creating inclusive, safe and resilient cities.

Keywords: *subjective well-being; happiness; quality of life; econometric modeling; Russian cities*

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Детерминанты субъективного благополучия жителей российских городов: оценка на основе новых данных

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Люди всегда находятся в поисках счастья. В последние десятилетия к этому добавилось желание человека измерить счастье, понять, что на него влияет, в том числе с учетом места его проживания (страна, регион, город). В условиях возрастания роли городов во всем мире, а также в связи с тем, что государственная политика по повышению качества жизни в России опирается на понятие качества жизни в городах, исследование детерминант субъективного благополучия городских жителей приобретает особую актуальность. Целью настоящего исследования является изучение влияния социальных, экономических, экологических факторов и факторов городской среды на субъективное благополучие жителей российских городов. Для достижения этой цели был выполнен обзор эмпирических исследований, посвященных влиянию различных факторов на субъективное благополучие. Затем авторы использовали впервые опубликованный на платформе VEB.RF набор данных, характеризующий качество жизни в 115 российских городах. Авторы обосновывают применение модели двойной логарифмической множественной регрессии для выявления детерминант субъективного благополучия. Расчеты показали, что наиболее значимыми факторами являются удовлетворенность культурной жизнью города, безопасность города, объективная экологическая ситуация и уровень благоустройства городских территорий. Также было обнаружено, что размер города не влияет на детерминанты субъективного благополучия его жителей. Выстраивание государственной и муниципальной политики в соответствии с выявленными детерминантами будет способствовать привлечению большего числа жителей и вносить вклад в устойчивое развитие российских городов за счет создания инклюзивной, безопасной и устойчивой городской среды.

Ключевые слова: *субъективное благополучие; счастье; качество жизни; эконометрическое моделирование; российские города*

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Introduction

The interest of researchers and the international community in the topic of human well-being (quality of life, welfare, happiness) has been stable over recent years, indicating the need to better understand this concept, including identifying related factors. The importance of this issue is confirmed by the fact that over the past 25 years, several Nobel Prizes in Economic Sciences have been awarded

for research related to well-being and personal happiness (A. Sen in 1998; D. Kahneman in 2002; Angus Deaton in 2015; R. Thaler in 2017; and M. Kremer, Abhijit Banerjee and Esther Duflo in 2019).

For many years, a so-called "objective" approach to assessing the quality of life has prevailed. The main measure of the quality of life was based on an economic indicator – GDP per capita. Starting from the late 1970s, socio-economic indicators such as the Physical Quality of Life Index (PQLI) and the Human Development Index (HDI)[1] have also been employed.

However, it was found that a country's level of economic development is not an absolute determinant of a person's well-being. According to "Easterlin paradox", per capita income significantly affects well-being up to a point, after which trends diverge (Easterlin, 1974). In countries where incomes are sufficient to meet basic needs, happiness is not significantly correlated with income.

Thus, it became apparent that subjective factors also influence a person's well-being. Over time, subjective well-being, or happiness, has been singled out as an independent object of study, not only by psychologists and sociologists, as seen in the works by Veenhoven (1991), but also by economists (Piekałkiewicz, 2017). International organizations have begun assessing it and comparing different regions. Some of the world's most popular methods for assessing happiness include the OECD's Better Life Index[2], the World Happiness Index[3], the Happy Planet Index[4], and the Gallup Global Well-Being Index.

When studying subjective well-being, the territorial dimension inevitable arises: assessments are given for countries, regions, and, more recently, cities. The New Urban Agenda highlights the relationship between urban development and quality of life in cities. UN Sustainable Development Goal 11 focuses on cities and settlements. This goal states: "Make cities and human settlements inclusive, safe, resilient and sustainable"[5]. According to the UN, to achieve this, it is necessary to improve living conditions for people in cities by providing convenient public transportation, improving road quality, reducing air pollution, creating comfortable public spaces and streets.

In the present study, we adhere to the view that satisfaction with the place of residence, in this case satisfaction with life in a city (city satisfaction, community satisfaction), is directly related to the subjective well-being of an individual in that location and serves as an indicator of it. We agree that community satisfaction forms only a part of the overall life satisfaction (most closely related to subjective well-being), which also includes personal, family, national, and global aspects (Sirgy et al., 1995).

As such, subjective well-being has been an independent variable in many studies, given the increasing competition among cities for human capital, and the importance of achieving the UN's Sustainable Development Goals (SDGs) and improving the quality of life for residents. It is therefore necessary to identify the factors that influence subjective well-being. The purpose of this study is to investigate the influence of various social, economic, environmental, and urban factors on subjective well-being in Russian cities using new statistical data. To achieve this, we will need to complete the following tasks:

(1) Review empirical studies that focus on various factors that affect subjective well-being.

(2) Use multiple regression analysis to assess the impact of social and economic factors as well as urban environments on subjective well-being in 115 cities across Russia.

(3) Determine whether the size of a city affects its residents' subjective well-being factors; draw conclusions based on our findings.

Literature review

Review of econometric studies on the impact of various factors on subjective well-being

Many econometric studies focus on the determinants of subjective well-being. Typically, a classic multiple regression model is employed, reflecting the dependency of subjective well-being (SWB) on various factors (X_i):

$$SWB = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_k X_{ik} + \varepsilon_i. \quad (1)$$

[1] Sen, A., Anand, S. (1994). Human Development Index: Methodology and measurement. New York: Human Development Report Office. https://hdr.undp.org/content/human-development-index-methodology-and-measurement

[2] OECD (2020). How's Life? 2020: Measuring Well-being. OECD Publishing. https://doi.org/10.1787/9870c393-en (date of access: 01.03.2024)

[3] Helliwell, J. F., Layard, R., Sachs, J. D., Aknin, L. B., De Neve, J.-E., Wang, S. (eds.). (2023). World Happiness Report 2023 (11th ed.). Sustainable Development Solutions Network. https://worldhappiness.report/ed/2023/ (date of access: 10.03.2024)

[4] Happy Planet Index (2021). https://happyplanetindex.org/happy-planet-index-2021-launch-event-recap/ (date of access: 10.03.2024)

[5] United Nations. https://sdgs.un.org/goals/goal11 (accessed on January 30, 2025)

The traditional idea is that SWB depends on an individual's income. Many studies are based on this premise, showing a positive and decreasing relationship between SWB and income (Diener et al., 1995; Easterlin, 1974; Ferrer-i-Carbonell, 2005). The influence of economic factors also includes the study of relationship between SWB, inflation, and unemployment. Thus, Di Tella et al. (2001) note that self-reported happiness among unemployed individuals is significantly lower than that of employed individuals with similar characteristics such as income, education, and so on. Regarding the impact of inflation on SWB, according to a model used in the study, a one percent increase in inflation reduces the level of happiness by 0.01 point on the life satisfaction scale.

With the increased focus on SWB, more and more researchers are beginning to consider non-economic factors as predictors of happiness. Thus, Helliwell (2003) demonstrates that single people appear to be on average less happy than married people. Dorn et al. (2007), using data from 28 EU countries, show that the level of democracy has a positive impact on SWB. Their study also found that the happiest countries are English-speaking, followed by German-speaking and Scandinavian countries (the influence of language and cultural factors on happiness is evident). Veenhoven's (2000) study of 38 developed countries assessed the impact of economic, political, and personal freedom on residents' happiness. The results showed that freedom and happiness are positively correlated.

Many studies are devoted to econometric assessment of the influence of various urban environmental factors on SWB. Thus, Stutzer and Frey (2008) analyzed the data of German residents from 1985 to 1998 and concluded that people with longer commute times reported systematically lower SWB. Stickley et al. (2015), analyzing data from nine former USSR (18,000 participants from Armenia, Azerbaijan, Belarus, Georgia, Moldova, Kazakhstan, Kyrgyz Republic, Russia, and Ukraine), identified a relationship between different crime types and SWB, showing a significant negative correlation between experiencing violence and lower happiness and satisfaction with life.

Cheng et al. (2022) analyzed the impact of air pollution on SWB based on daily data from 13 Chinese cities between August 2014 and December 2019. The authors found that air pollutants were negatively correlated with SWB: well-being tended to decline further during hot seasons due to pollution during.

Cuñado and Gracia (2013) examined the relationship between air pollution, climate change and SWB (happiness), using data from Spanish regions. The results showed that after stabilizing most socio-economic variables, regional differences in SWB remained significant. This may be explained by differences in variables related to both air pollution and climate change.

The impact of digitalization (smart cities) on the well-being of residents has also been studied. Lin et al. (2019) empirically showed that digitalization positively affects the level of safety, usefulness, and convenience for residents when it comes to accessing information, services and interactions, which directly impacts SWB. The paper by Litvinceva et al., (2019) used a combined methodology to assess the digital component of population quality of life for 85 regions of Russia, eight federal districts, and the country overall for 2015–2017. Chernenko (2024) in his study for Russian regions proved the role of digitalization as a major catalyst for technological change, with social consequences that increasingly affect SWB.

A large number of studies have been devoted to the impact of various factors on SWB. Only a few of these are described below. In Helliwell's (2003) study, this kind of research was carried out using data from the World Values Survey (WVS), for the years 1980–1982, 1990–1991 and 1995–1997, for 46 countries with 87,806 total observations. Econometric modeling showed that the following factors had a significant influence on the quality of life (the direction of influence is shown in parentheses): health status (+); having a job (+); having a partner (+); age (a *U*-shaped distribution with the most satisfied being aged 18–24 and over 55); religiosity and attendance at church (+); participation in public organizations (+); honesty in paying taxes (+); trust in others (+); income level (+); good relationships between people (+); quality of government (+); and infant mortality (–). Factors assessing education and life expectancy were not significant.

Smyth et al. (2010), based on sociological survey data from six Chinese cities, using a regression model revealed that the factors influence SWB include age (*U*-shape relationship, personal well-being was at its lowest at age 25), marital status (participants who are married reported 4% more personal well-being compared to single participants), the number of children (participants with children reported 3% higher personal well-being), and income (moving into a higher income category raise personal well-being by 3%). According to the study, gender and education do not show a statistically significant connection with SWB.

Chuluun et al. (2016) used both ordered logistic and linear regressions to study SWB in Mongolia. They found that individual income, health, marital status and exercise were all positively associated with life satisfaction in Mongolia.

The study by Bernini and Tampieri (2019) was conducted using the data on Italian cities from 2010 to 2013. Life satisfaction (or happiness, these are synonyms for the authors) was chosen as the dependent variable. The econometric modeling showed that socio-demographic factors had a significant impact on life satisfaction, including a *U*-shaped dependence on age, higher education, marital status/partnership, employment, and retirement status.

Leyden et al. (2011) examined the relationship between SWB (happiness) and the characteristics of 10 largest world cities including New York, London, Paris, Stockholm, Toronto, Milan, Berlin, Seoul, Beijing, and Tokyo. According to the econometric model, satisfaction with financial situation, health, and participation in social life were not the only contributors to happiness: it was also influenced by the availability of public transport, cultural and entertainment facilities, and the convenience and accessibility of cities for families with children.

It should also be noted that many studies related to the identification of factors of subjective well-being also consider the spatial aspect. Thus, Mouratidis and Yiannakou (2022) consider this aspect when examining cities in the northern and southern regions of Europe (Thessaloniki and Oslo). They suggested that urban environmental characteristics have an impact depending on local context, culture, and national preferences. Okulicz-Kozaryn & Valente (2019) examined the impact of the quality of life (economic well-being, social justice and stability, educational opportunities, recreational and cultural opportunities, etc.) on the level of happiness in European cities. Their findings suggest that quality of life increases as one moves from East to West Europe, while SWB increases more in Northern than Southern cities. Delken (2008) studied SWB separately for shrinking and growing cities in Germany.

Studies on the subjective well-being of Russian regions and cities

There are a number of studies conducted on the SBW domains of Russian regions. The work by Nemirovskaya and Soboleva (2020), based on nine regions and cities of federal significance in Russia, examines the relationship between SWB and factors such as material well-being of the respondents (satisfaction with financial situation, assessment of individual income, income of reference group, and respondent's income relative to reference group), as well as gender, age, marital status, number of children, self-reported health status, size of locality, religiosity, higher education, employment status. The findings indicate that material component plays a significant role in SWB. At the same time, at the regional level, additional factors such as age, marital status, health status, level of education, religiosity and availability of work also contribute to SWB, but their contribution varies across regions.

In the paper by Latova (2018), based on data from annual sociological research and monitoring studies, the author examines the level of satisfaction and the impact of recent socioeconomic crises (2008–2009 and 2014–2016). Key characteristics such as "material security," "nutrition," and "clothing," as well as "living conditions" and "health status," are essential in determining the level of satisfaction.

Andreenkova and Andreenkova (2019) conducted a comparative analysis of the determinants of life satisfaction in Russia and Europe based on the European Social Survey data. The results showed that the structure of the factors influencing life satisfaction in Russia was similar to that in other European countries, with physical and mental health, financial situation, and the evaluation of the general economic and political situation, national economic performance, and government effectiveness being the most significant.

In recent decades, there has been a shift in the focus of regional research towards cities, including studies of urban residents' SWB (e.g., Tatarkin and Animitsa, 2012). However, detailed research into Russian cities' well-being is still lagging behind, and the determinants of Russians' SWB remain largely unknown. Currently, cities are the focal point for attracting human capital globally, including in Russia, and ignoring SWB domains can impede management decisions by city authorities. We found only two studies that used econometric analysis to examine Russian citizens' domains of SWB published in indexed journals over the past decade.

Potapov et al. (2016) conducted a study using a sample of 1,636 respondents from Perm, one of Russia's large cities with a population of 1 million. The authors built several different multiple

regression models to examine the impact of various factors on residents' satisfaction. These factors included culture, education, environment, healthcare, social security, safety, and sports facilities. Of these factors, the most significant were the safety of urban environments and satisfaction with cultural life in the city.

Bakaeva et al. (2022) identified indicators that affect the overall happiness of the urban population in Russia. These include demographic, social indicators, indicators of urban function implementation, the technical state of urban services, the level of implementation of social standards, environmental indicators, and safety indicators. A correlation analysis was conducted to establish a relationship between these indicators and the happiness levels among residents of Russian cities. Calculations reveal that cities with adequate urban functions were the happiest to live in.

A significant number of papers have studied the influence of different factors (socio-economic, urban environment, ecology, etc.) on the SWB of local residents in various countries, regions and cities. These multi-faceted studies employ econometric methods, but there is a lack of research on life satisfaction in Russian cities. Russian researchers mainly rely on subjective data collected from respondents about their perceptions of various aspects of life rather than objective data that characterize the socio-economic aspects of their place of residence.

In this regard, the following questions arise: what factors influence a subjective well-being in Russian cities? What makes a city attractive to Russian residents?

Materials and methods

Information base and initial set of indicators

In this study, we use annual statistical data characterizing the quality of life in Russian cities provided by VEB.RF, Russia's largest development agency. This dataset was first published in 2022 and was chosen for several reasons. First, it is an open dataset with information on 115 Russian cities, consisting of over 250 metrics based on the internationally recognized OECD approach to assessing quality of life. Second, the dataset contains current and comparative metrics based on official municipal statistics and qualified sociological surveys (i.e., it combines both subjective and objective measures of quality of living).

Indicators were collected for 115 different cities on the VEB.RF platform, including: administrative centers of federal subjects of the Russian Federation; cities with population of 200,000 or more; and priority cities according to the Spatial Development Strategy of the Russian Federation until 2025. Moscow and St. Petersburg were excluded from the sample because they are global megacities and differ significantly in terms of their quality of life from other Russian cities.

At the first stage, statistical indicators were selected for SWB assessment from the VEB.RF database for 12 aspects of quality of life that correspond to OECD's approach. These indicators characterize the relevant aspects as fully as possible.

To assess SWB, we choose the "satisfaction" indicator from the database, which is the normalized arithmetic mean of two sub-indicators:

1. The share of people who want to change their place of residence (%), which is calculated as the percentage of respondents who answered "Yes, I would like to move to another locality in my region", "Yes, I would like to move to another region of Russia", "Yes, I would like to move abroad" to the question "Would you like to change your place of residence?"

2. Average self-assessment score, which ranges from 1 (worst) to 10 (best). This score is calculated by averaging the points indicated by respondents when answering the question "Imagine a ladder with steps numbered from 0 (bottom) to 10 (top). The top step is the best possible life, and the lowest step is the worst possible life. On which step of the ladder are you at the moment?"

For first, reverse-counting sub-indicator, normalization occurs according to formula (2). For second, direct-counting sub-indicator, normalization occurs according to formula (3):

$$x_{i\,norm} = 100 - \left(\frac{(x_i - x_{i\,min})}{(x_{i\,max} - x_{i\,min})}\right) * 100, \quad (2)$$

$$x_{i\ norm} = \frac{(x_i - x_{i\ min})}{(x_{i\ max} - x_{i\ min})} * 100. \quad (3)$$

The higher the final value of the "satisfaction" indicator (the closer to 100 it is), the higher residents' rating of the quality of life in a city (subjective well-being) (Table 1). Therefore, the construction of this "satisfaction" indicator in this case allows us to combine satisfaction with a specific place (city) and with one's own life (individual), which, in our view, directly characterizes subjective well-being (Sirgy et al., 1995).

Table 1

Average self-assessment by the population of SWB in the city

City	SWB, score
Grozny	94.80
Salekhard	83.93
Tambov	82.77
Sterlitamak	81.95
Sochi	79.52
Tyumen	77.39
Yalta	75.96
Vologda	72.01
Makhachkala	71.79
Krasnodar	70.71
…	…
Nakhodka	32.46
Arkhangelsk	32.36
Cherkessk	32.16
Biysk	31.71
Norilsk	29.37
Kyzyl	27.90
Cherepovets	27.55
Khabarovsk	27.12
Chita	26.12
Komsomolsk-na-Amure	25.33

Source: Authors' compilation; VEB.RF. Index of quality of life in Russian cities. Database (2021). https://citylifeindex.ru/database (accessed on December 16, 2023)

After choosing initial indicators, we calculated the pairwise correlation coefficients with the dependent variable *Y*. All the selected indicators, along with their description, unit of measurement and pairwise correlation (r) to Y, are presented in Table 2.

The pair correlation coefficients indicate that not all of the considered indicators have a significant correlation with the dependent variable. In particular, none of the indicators related to the development of digital technologies significantly affects the change in residents' satisfaction with their life in the city. This may be partially due to the low level of development of digital services and the lack of need for them in many cities, especially those with population less than 250,000 people (37% of the entire sample).

It is noteworthy that there is no significant correlation between SWB and indicators such as per capita cash income and unemployment rate. At the same time, a moderate negative relationship exists with the proportion of the population living below the subsistence minimum in the region. This indicates that economic development still matters in cities. Of all "economic" indicators, the latter has the highest statistical reliability, since a low level of income must be verified by providing necessary documents to government bodies, while other indicators can be distorted by shadow income and "imaginary" unemployment.

Table 2

Initial composition of indicators determining the degree of life satisfaction in the city

Variable	Brief description	*r*
Y	Average self-assessment by the population of SWB in a city, score (0 – absolutely dissatisfied, 100 – completely satisfied) – dependent variable	1.0
	Living conditions	
X1	Share of households with broadband Internet access, %	0.01
X2	Ratio of average rent to average per capita monthly income, %	0.24
X3	Ratio of the average cost of 1 square meter of housing to the average monthly income of a person, %	0.28
X4	Share of residential buildings constructed after 1980, %	0.20
X5	Share of wear and tear in urban networks (heating, steam, water, and sewage), %	–0.19
	Security	
X6	*Number of crimes, units, per 100,000 people*	*–0.42*
X7	*Share of illuminated areas in streets, driveways and embankments, %*	*0.30*
	Income and job	
X8	*Share of the population with incomes below the subsistence level in the region, %*	*–0.34*
X9	Average per capita income, adjusted to the CPI, rubles	0.15
X10	Number of companies in the creative industries, units per 10,000 people	0.22
X11	Unemployment rate, %	–0.07
	Health	
X12	Mortality rate from circulatory and respiratory diseases among people under 65 years old, people per 100,000 people	–0.20
X13	Availability of doctors and paramedical personnel in outpatient clinics, units per 10,000 people	0.06
	Education	
X14	Satisfaction with preschool education, proportion of "rather satisfied" and "completely satisfied" responses to the question "How satisfied are you with the quality of pre-school education for your child (children)?", %	0.14
X15	Satisfaction with school education, proportion of "rather satisfied" and "completely satisfied" responses to the question "How satisfied are you with the quality of school education for your child (children)?", %	0.18
	Mobility	
X16	Percentage of road network in standard condition in urban agglomerations, %	0.18
X17	Availability of car sharing services, yes (1) / no (0)	0.21
X18	Proportion of population living within a 10 minutes' walk from public transport stops, %	0.16
X19	Average time to commute from home to workplace, minutes.	0.00
X20	Public transport frequency, minutes	0.04
X21	Financial affordability of air travel, ratio of cheapest air ticket price to Black Sea coast and back in summer per adult to average city resident's salary, %	–0.23
X22	*Financial affordability of railway travel, ratio of cheapest train ticket price to Black Sea coast and back in summer per adult to average city resident's salary, %*	*–0.44*
	Improvement	
X23	Green space coverage, percentage of total area, %	0.16
X24	Access to parks and forests, percentage with at least one hectare within 15 minutes' walking distance, %	0.26
X25	*Share of residents who consider their city beautiful and well-kept, %*	*0.49*
X26	Residential density, square meters per hectare	0.15
	Ecology	
X27	*Comprehensive air pollution index, score*	*–0.32*
	Social activity	
X28	Assessment of interpersonal trust, proportion of respondents who trust people living in their city, %	0.27
X29	Involvement in communities, percentage of respondents participating in public initiative groups and local communities created to help others, protect interests, and solve common problems of residents, %	–0.04
	Civil rights	
X30	Availability of digital tools for influencing life in the locality, assessment of availability and functionality, score	–0.08
X31	Corruption perception index, points	–0.22
	Work and leisure	
X32	Retail space per 1,000 residents, square meters	0.14
X33	*Self-assessment of cultural life in the city, 1 to 10 points*	*0.52*
X34	Number of museums, cinemas, galleries, theaters, philharmonics, etc., from aggregators (Yandex), units	0.07

Source: Authors' calculation; VEB.RF. Index of quality of life in Russian cities. Database (2021). https://citylifeindex.ru/database (accessed on December 16, 2023)

No significant correlation was found between indicators of school and preschool education satisfaction and mortality rates from circulatory and respiratory diseases among people under 65 years old (which indirectly reflects the quality and accessibility of medical services), possibly because not all respondents considered issues related to child education and health care important (due to their age, degree of concern about their health, and other reasons).

From all analyzed indicators, those with pairwise correlations with SWB equal or exceeding modulo 0.3 were selected (shown in italics in Table 2). These indicators were then used to construct a multiple regression model in the next sections.

Descriptive statistics for selected indicators

Table 3 presents descriptive statistics for the selected indicators.

Table 3

Descriptive statistics of selected indicators

Variable	Label for progr.	*N*	Avg.	Std. deviation	Median	Min	Max
Explained variable							
Average self-assessment by the population of SWB in a city, score (0 – absolutely dissatisfied, 100 – completely satisfied)	*SWB*	115	51.8	13.8	52.0	25.3	94.8
Explanatory variables							
Number of crimes, units, per 100,000 people	*crime*	115	1467.9	388.3	1401.4	212.3	2610.4
Share of illuminated areas in streets, driveways and embankments, %	*light*	115	80.0	19.9	85.7	29.9	100.0
The share of the population with incomes below the subsistence level in the region, %	*poor*	115	13.8	4.4	13.6	5.6	34.1
Financial affordability of railway travel, %	*transport*	115	23.4	13.4	19.4	3.4	70.0
The share of residents who consider their city beautiful and well-kept, %	*wellmaint*	115	51.3	20.5	50.0	10.9	94.0
Comprehensive air pollution index, score	*eco*	115	1.7	0.9	1.3	1.0	4.0
Self-assessment of cultural life in the city, 1 to 10 points	*culture*	115	5.6	0.8	5.5	3.9	8.0

Source: Authors' calculation

Descriptive statistics allow us to draw conclusions about variability in the indicators. In general, the presented data are quite homogeneous. A significant variation between cities can be seen in the indicator for financial accessibility to railway transportation, which can be explained by differences in geographical distance from the Black Sea coast and logistical factors in different cities. There is a significant variation in residents' perception of city maintenance between Russian cities, which can be explained by different levels of funding. There are also significant differences in air pollution between cities, reflecting differing environmental conditions.

Next, based on the OLS method, we provide two versions of the econometric multiple regression model: a classical linear model (model 1) and a double logarithmic model (model 2). All computations were performed using the econometric software *R*.

Classical linear multiple regression model

The results of data processing for the classical linear model are presented in Table 4.

Table 4

Influence of various factors on the SWB (model 1)

Indicators	Model 1
Constant	32.229***(10.827)
crime	–0.007* (0.004)
light	0.059 (0.051)
poor	–0.212 (0.277)
transport	–0.109 (0.074)
wellmaint	0.136 (0.061)**
eco	–1.498(1.212)
culture	4.669*** (1.772)
Number of observations	115
Adjusted R^2	0.408
F statistics	12.232***

Note: Assessment was performed using conventional OLS. The dependent variable is average self-assessment by the population of SWB in a city (*SWB*). Robust standard errors are given in parentheses. * denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.

Source: Authors' calculation

Let us check this model for multicollinearity by calculating the variance inflation factor (*VIF*). This measures the correlation between predictor variables and strength of that correlation in a regression model. Table 5 presents the calculation results.

Table 5

Variance inflation factors for model 1

crime	*light*	*poor*	*transport*	*wellmaint*	*eco*	*culture*
1.556	1.286	1.509	1.810	1.630	1.491	1.771

Source: Authors' calculation

Since all *VIF* coefficients are less than 10, we can assume that there is no significant multicollinearity in the model.

The estimation results obtained for the classical linear multiple regression model show that overall, the model is statistically significant, as indicated by the significant value of *F* statistic at the 1% level. The adjusted R^2 is 0.408, which means that this model explains 41% of changes in the SWB of city residents. Regarding the explanatory variables in this model, the variables that are statistically significant are: crime level (*crime*), city maintenance (*wellmaint*), and cultural development in the city (*culture*).

Double log multiple regression model

The results of data processing for the double logarithmic model are presented in Table 6.

The results of the econometric evaluation for model 2 also shows its significance (the value of *F* statistic is 14.047, and it is significant at 1% confidence level). The adjusted R^2 is 0.445, suggesting that 44.5% of changes in SWB can be explained by the model. Predictor variables such as crime level (*crime*), illumination (*light*), city maintenance (*wellmaint*), environmental situation (*eco*), and cultural development (*culture*) are all statistically significant. Meanwhile, predictor variables such as the proportion of people with incomes below the subsistence level (*poor*) and transport accessibility (*transport*) proved to be less significant.

Table 6

Influence of various factors on the SWB (model 2)

Indicators	Model 2
Constant	4.145*** (0.689)
ln crime	–0.211*** (0.064)
ln light	0.106* (0.063)
ln poor	–0.100 (0.066)
ln transport	–0.040 (0.030)
ln wellmaint	0.107** (0.049)
ln eco	–0.078* (0.043)
ln culture	0.490*** (0.170)
Number of observations	115
Adjusted R^2	0.445
F statistics	14.047***

Note: Assessment was performed using conventional OLS. The dependent variable is average self-assessment by the population of SWB in the city (*ln SWB*). Robust standard errors are given in parentheses. * denotes significance at the 10 % level; ** denotes significance at the 5 % level; *** denotes significance at the 1 % level.

Source: Authors' calculation

Comparing the two models, we see that model 2 has a higher adjusted R^2 and F statistic, so it should be used for further analysis of the influence of different factors on SWB.

Additionally, we checked the accuracy of model 2 using the Ramsey test. Since the p-value is 0.935, greater than 0.05, we can reject the hypothesis that our model specification is incorrect.

Assessing the impact of city status (size) on the SWB of its residents

To evaluate the impact of city status (population size) on subjective well-being, all 115 cities were divided into two groups: the first group included cities with more than one million inhabitants and their satellites, while the second group included administrative centers and the largest cities of the constituent regions of the Russian Federation (Table 7). A dummy variable *status* (shift variable) representing the size of the city was introduced, and Chow test for structural change in relation to city *status* was conducted:

$$F\ (8, 99) = 0.844675;\ p\text{-value } 0.5658$$

According to the p-value from the Chow test, there was no structural shift in the data, indicating that city size does not influence subjective well-being among residents.

Table 7

Distribution of cities into two groups depending on their size

Cities with more than a million inhabitants and their satellites	Administrative centers and largest cities in constituent entities of the Russian Federation
Balashikha, Berdsk, Volgograd, Volzhsky, Voronezh, Gatchina, Dzerzhinsk, Yekaterinburg, Kazan, Krasnogorsk, Krasnodar, Krasnoyarsk, Nizhny Novgorod, Novosibirsk, Omsk, Perm, Rostov-on-Don, Samara, Taganrog, Ufa, Chelyabinsk	Abakan, Arkhangelsk, Astrakhan, Barnaul, Belgorod, Berezniki, Biysk, Birobidzhan, Blagoveshchensk, Bratsk, Bryansk, Veliky Novgorod, Vladivostok, Vladikavkaz, Vladimir, Vologda, Gorno-Altaysk, Grozny, Dimitrovgrad, Ivanovo, Izhevsk, Irkutsk, Yoshkar-Ola, Kaliningrad, Kaluga, Kemerovo, Kirov, Kovrov, Komsomolsk-na-Amure, Kostroma, Kurgan, Kursk, Kyzyl, Lipetsk, Magadan, Magnitogorsk, Maykop, Makhachkala, Murmansk, Naberezhnye Chelny, Nalchik, Nakhodka, Nizhny Tagil, Novokuznetsk, Novomoskovsk, Novy Urengoy, Norilsk, Obninsk, Oryol, Orenburg, Orsk, Penza, Petrozavodsk, Petropavlovsk-Kamchatsky, Pskov, Pyatigorsk, Rybinsk, Ryazan, Salekhard, Saransk, Saratov, Sevastopol, Severodvinsk, Seversk, Simferopol, Smolensk, Sochi, Stavropol, Stary Oskol, Sterlitamak, Surgut, Syktyvkar, Tambov, Tver, Tobolsk, Tolyatti, Tomsk, Tula, Tyumen, Ulan-Ude, Ulyanovsk, Ukhta, Khabarovsk, Khanty-Mansiysk, Cheboksary, Cherepovets, Cherkessk, Chita, Elista, Engels, Yuzhno-Sakhalinsk, Yakutsk, Yalta, Yaroslavl

Source: Authors' compilation; VEB.RF. Index of quality of life in Russian cities. Database (2021). https://citylifeindex.ru/database (accessed on November 12, 2023)

Results and discussion

Model 2 takes the form of equation (4):

$$\ln \widehat{SWB}_i = 4.145 - 0.211\, ln\, crime_i + 0.106\, ln\, light_i - 0.100\, ln\, poor_i - 0.040\, ln\, transport_i + 0.107\, ln\, wellmaint_i - 0.078\, ln\, eco_i + 0.49\, ln\, culture_i \quad (4)$$

An increase in crime rate (*crime*) by 1% decreases the self-assessed well-being of the population in the city by 0.2%, while an increase in illuminated urban area (*light*) by 1% increases SWB by 0.1%. The significance of these indicators is apparently due to the fact that for residents, when subjectively assessing well-being, it is important that their primary safety needs are satisfied. These findings are consistent with those of Stickley et al. (2015), Potapov et al. (2016), Mouratidis and Yiannakou (2022), and Lin et al. (2019). An increase in maintenance (*wellmaint*) by 1% would increase SWB by 0.1%, which coincides with the findings of Leyden et al. (2011) and Pfeiffer and Cloutier (2016). An increase of 1% in air pollution (*eco*) would decrease residents' SWB by 0.08%. Environmental pollution has a negative impact on well-being as confirmed by Cheng et al. (2022), Cuñado and Gracia (2013), Ryumina (2016), Belik et al. (2019). Finally, improving cultural life (*culture*) in a city by 1% leads to an increase of SWB equal to 0.5%, making it the most significant factor, which coincides with the conclusions of Potapov et al. (2016) for the Russian city of Perm.

The coefficients for the *poor* and *transport* variables are not statistically significant, so it is not worth interpreting them. There is no certainty that they are different from zero, so if the model specification used is adequate, we can assume that the economic indicators that characterize life in the city, such as the level of economic development and earning opportunities, as well as the cost of rail travel to Black Sea resorts compared to the average salary, do not significantly influence SWB, which is consistent with the "Easterlin paradox".

The lack of a significant statistical correlation between economic factors and SWB for Russian cities is different from the conclusions made by Nemirovskaya and Soboleva (2020) for Russia based on the 2011–2012 World Values Survey. We believe that this may be due to the fact that Nemirovskaya and Soboleva use variables that characterize income based on respondents' self-assessments, while we rely on absolute values of income in cities (respondents might be satisfied with their incomes, but they might not be objectively high compared to other areas).

Nemirovskaya and Soboleva also note that the SWB index for cities and regions does not seem to be directly related to the objective economic situation there. Thus, in Moscow, with the highest average per capita income in Russia, SWB is lowest (only 5% of respondents are completely satisfied with their lives). In contrast, residents of less economically developed regions like Kabardino-Balkaria and Chuvashia are much happier and more satisfied with their lives. The authors attribute these results to economic inequality in Moscow and the influence of sociocultural factors.

We may also consider another important trend that emerged in Russia after 2020 due to COVID-19: the increase in remote employment and self-employment in highly skilled fields like IT, design, marketing, consulting, etc. Today, 8% of all vacancies in Russia offer remote work opportunities, and these positions are more attractive to job seekers than traditional jobs[6]. In 2024, there were 12 million self-employed individuals[7]. Of these, approximately 15% were "white-collar workers," many of whom had the option to work remotely (Shevchuk et al., 2022). Considering these factors and the increasing mobility between cities, the importance of non-economic aspects of SWB may have increased.

Regarding the spatial aspect of this study, we tested the hypothesis that the factors of SWB depend on the size of the city. Our analysis of factors affecting SWB in cities of different sizes showed that city status was not statistically significant.

[6] Head Hunter research "The labour market today and what every HR specialist and top manager should know about it". https://berezovsky-sverdlovsk.hh.ru/article/31520 (accessed on March 10, 2024)

[7] Federal Tax Service of the Russian Federation. Self-employment. https://geochecki-vpd.nalog.gov.ru/self-employment (accessed on January 10, 2025)

A significant source of funding for expenditure in the identified areas in the constituent entities and municipalities of the Russian Federation is the implementation of such national projects as "Housing and Urban Environment," "Culture," and "Ecology." However, in 2023, these projects collectively represented only 11% of total national project expenditures (Table 8).

Table 8

National Projects Implementation in 2023

Name of the national project	Share of the national project in the overall implementation
Culture	1.80%
Digital economy of the Russian Federation	0.49%
Education	12.87%
Housing and urban environment	18.52%
including the federal project "Formation of a Comfortable Urban Environment"	4.15%
Ecology	4.80%
Small- and medium-sized entrepreneurship and support for individual entrepreneurial initiative	1.39%
Tourism and hospitality industry	1.61%
Labor productivity	0.11%
Healthcare	11.77%
Demography	12.53%
Safe quality roads	28.25%
Science and universities	0.42%
International cooperation and export	0.50%
Comprehensive plan for modernization and expansion of railway and energy infrastructure	0.78%
Total within the framework of national projects	**100%**

Source: Authors' compilation; Ministry of Finance of the Russian Federation. https://www.iminfin.ru/areas-of-analysis/np/ispolnenie-natsionalnyh-proektov (accessed on September 16, 2024)

In 2024, Russia began the process of updating national projects in order to align them with the country's new development objectives, as outlined in the Presidential Decree No. 309 dated May 7th, 2024, entitled "On the National Development Goals for the Russian Federation until 2030 and beyond to 2036." One of these objectives is to create a comfortable and secure living environment, including transforming Russian cities into safe, environmentally friendly, well-maintained, culturally diverse, and attractive locations to live in.

Currently, the Government is preparing to launch the new national project "Infrastructure for Life" in 2025. This project focuses on integrated territorial development, including housing and road construction, improving living standards, modernizing public utilities, and providing modern public transportation. To enhance subjective well-being, it is recommended to allocate more funding for initiatives aimed enhancing urban safety, improving environmental conditions, beautifying landscapes, and supporting cultural institutions. Furthermore, when allocating federal funds, it is important to consider the subjective well-being of residents within cities in relevant regions.

Conclusions

This study builds on previous research on subjective well-being in Russia and worldwide by conducting an econometric analysis of the subjective well-being domains among Russian citizens, an area that has not been fully explored yet. The analysis uses the first publicly available dataset for 115 cities (2021), encompassing both subjective (perception-based) and objective assessments (derived

from statistics). Consistent with earlier findings in Russia and other developed countries, the study identifies key factors affecting subjective well-being, including satisfaction with culture, urban safety, environment, and urban beautification. Unexpectedly, objective economic factors were not significant in the model, possibly reflecting the growth of remote and well-paid employment.

While the dataset covering only 2021 limits the capacity for drawing definitive policy conclusions, due to the lack of panel data, the study has practical significance. It provides deeper insights into factors shaping citizens' subjective perceptions of the quality of life in Russian cities, which can help local governments design human-centered urban development strategies, prioritize investments, and adopt budget policies that better meet the needs of average citizen.

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