

CENTRAL ASIA
AND CAUCASUS

TOP-40 CITIES

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CREDITS

We are happy to present our first competitiveness ranking of 40 major cities in Central Asia and the Caucasus.

The project was delivered by a team of ISPG experts. We would like to extend special thanks to Nurbek Achilov for collecting and making statistics available. The project would also have been impossible to deliver without the drafting and editing assistance from the following ISPG experts:

- **Batikhon Kalibekov**
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- **Roman Kotyaca**

We also express our gratitude to our foreign experts for their valuable inputs, inspiration, and suggestions:

- **Yerzhan Saltybaev**, Director of Institute of World Economics and Politics
- **Marc Uzan**, Executive Director & Founder, Reinventing Bretton Woods Committee
- **Masami Torikoshi**, International Center for Science and Technology
- **Kim Kwang Dong**, International Cooperation Consultant / Professor

We hope that our effort to produce an annual ranking of cities in the countries of the region will continue, with coverage to be extended in the future.

We are greatly looking forward to further support from our partners.

Sincerely yours,

Maxat Kurbenov
Managing Director
ISPG

INTRODUCTION

Today on the global map of the world, it is not individual countries, but cities of the world that are turning into a point of attraction of brains, capitals, investments, and technologies.

As many researchers and experts assume, the issues of competition between countries will become less relevant significantly in the future. The competition will be concentrated around cities as they are more mobile ecosystems. For example, famous urbanist Jane Jacobs says that it is cities, not countries, that drive economic growth (1).

According to the World Economic Forum, urbanization should become the future megatrend. The forum reports say that as early as 2020 60% of the population will be living in cities. Thus, according to the World Bank's schedule (2), the urban population in 2018 was already 55.3%. Fifty years ago or in 1968, this was 36.2%.

Max Roser, an economist at Oxford University and founder of Our World In Data, says that if in the 1950s most of the population had lived in the cities of developed countries in Europe, America, and Asia, then almost all countries of the world will have their main population living in cities by 2050 (3).

By 2050, according to UN forecasts, about 2/3 of the global population, or about 67% of the world will be living in cities.

Urbanization and the growth of megacities are becoming the main global trends. Neither country nor region can prosper economically if their cities - innovative ecosystems - are not improved continuously. The speed and wide extent with which cities take over and apply technologies will drive their ability to compete with others in attracting innovation, investment, creative community and enabling attractive conditions for society.

The main outcomes of such urbanization and megatrend, we believe, are the following:

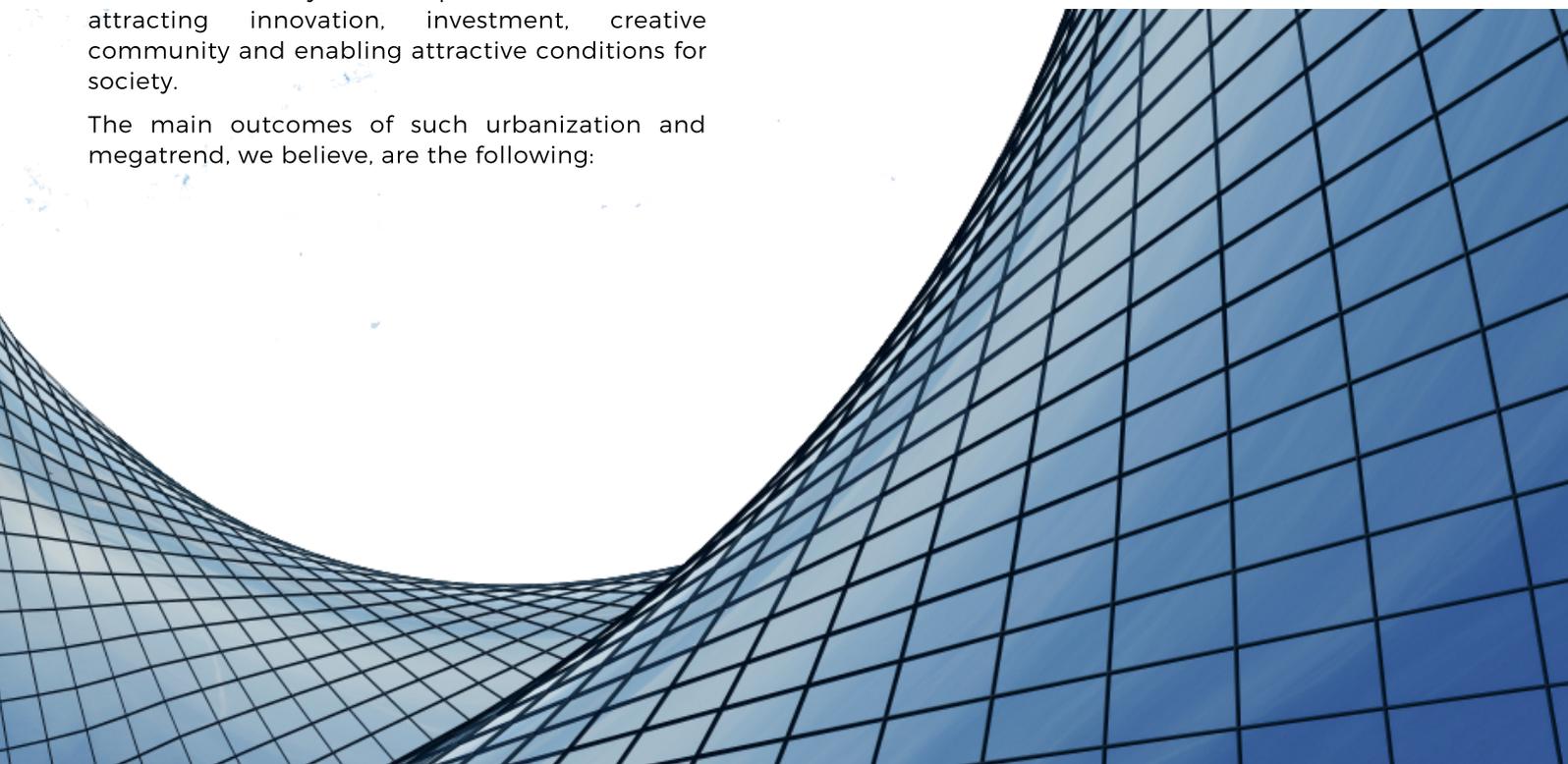
- 1) Better infrastructure and convenience of cities for life, professional career and leisure;
- 2) High economic potential versus rural areas;
- 3) A better environment for pursuing education and healthcare services;
- 4) Access to information, financial and other resources for development;
- 5) High level of civil security and protection;
- 6) Better conditions for the creative community and bringing talents to light;
- 7) High level of culture in cities.

Since former Soviet states passed through a relatively short period after they gained independence, we would like to gain an insight into what successes have been accomplished by the main cities of the countries of Central Asia (hereinafter CA) and the Caucasus. This rating is a study of the competitiveness of cities in CA and the Caucasus and of how attractive they are for doing business, living and investment, with such survey, based on official data for 2018.

The population of 40 cities in review totaled 21.3 million in 2018, with the total GRP amounting to 275.9 billion USD. Just to compare, Moscow is home to 11.9 million people, and its GRP is 238.3 billion USD (see Table E).

The competitiveness rating of 40 cities in 8 countries of CA and the Caucasus was produced in order to yield a comparative analysis of how competitive the main cities in the region are and to assess key macroeconomic and social indicators of development.

Overall, this ranking should become a user-friendly tool for assessing the attractiveness of the cities of the countries in CA and the Caucasus.



BACKGROUND

After the collapse of the USSR, the cities of CA and the Caucasus have been developing in different realities, with development objectives being resolved amidst difficult geopolitical and economic situation in the countries. The capitals of countries and key strategic cities priority have become the priority development centers.

In total, the survey encompassed 40 cities from 8 countries of CA and the Caucasus. The main criterion 40 cities had to meet has been the population, such as the cities with more than 150 thousand residents (see Tables A, B, and C).

In 2018, the population of 40 cities in the review made it to 21.3 million, with the total GRP amounting to 275.9 billion USD. For example, the population of the Paris Region is 12.2 million with GRP of 808 billion USD (2018), and the population of Tokyo is 13.9 million (2019), with a GRP reaching 869 billion USD.

Average GRP per capita across 40 cities of CA and the Caucasus is 6,155.5 USD, with Atyrau scoring as much as 37.7 thousand USD, which is 6.1 times higher than the average, and with Namangan at a minimum level with 808.5 USD, which is 7.6 times below than average.

The cities of CA and the Caucasus have been rated based on statistical data from official websites of the public authorities at year-end 2018.

It is important to note that the main indicators in this ranking are applied per capita, which makes it possible to effectively compare the capabilities and potential of large and small cities.

In order to rate how well those cities perform in technology development and human capital, economic and trade potentials, as well as levels of environmental emissions and crime rates, we took 14 indicators divided into 5 main directions and relied on the statistical data from the official websites of the authorities of the cities.

FIVE KEY AREAS INCLUDE:

1. Technological Development and Human Capital;
2. Economic Potential;
3. Trade Potential;
4. Environmental Emissions;
5. Crime Rate.

The evaluation of technological development and human capital includes the following indicators:

1. Per capita R&D expenditures;
2. Human Development Index.

The economic potential evaluation includes the following indicators:

1. Per capita GRP;
2. Per capita investments;
3. Ratio of small businesses to the population;
4. Average salaries;
5. Number of per capita tourists;
6. Ratio of migration balance to the population.

The trade potential evaluation includes the following indicators:

1. Per capita exports;
2. Per capita imports;
3. Balance of export and import per capita.

The environmental emissions evaluation includes the following indicators:

1. Per capita environmental emissions;
2. Total emissions in the city.

The crime rate evaluation concludes the following indicator:

1. Ratio of registered crimes to the population.

AS A RESULT OF THE RESEARCH, THE TOP 10 COMPETITIVE CITIES ARE:

01 Nur-Sultan 390 points

02 Baku 384 points

03 Tbilisi 382 points

04 Aktau 379 points



In the overall rating (Table B), Nur-Sultan ranked the highest with a total score of 390 points, with the lowest rating assigned to Osh with a total score of 183 points.

The top-10 cities include 5 capitals of the Central Asian countries, as well as Batumi, Aktau, Atyrau, Almaty, and Uralsk. Ashgabat and Batumi share the 5th position with their score of 366 points.

Yerevan, the capital of Armenia, ranks 13th with a total score of 279 points; Dushanbe, the capital of Tajikistan, comes 16th with a total score of 267 points; and Bishkek, the capital of Kyrgyzstan, is 18th with a total score of 264 points (see Table B)

Based on the data we have received, we expect that this rating to become a useful and objective tool to assess the competitiveness of cities across the region, their strengths and weaknesses, as well as to determine their development policies and practices.

RATING OF 40 CITIES OF THE CA AND THE CAUCASUS IN FIVE DIRECTIONS

This rating of cities in CA and the Caucasus is our first step for assessing the cities of the region based on official data for the year 2018.

The study focused on the city's competitiveness indicators in 5 key areas in order to identify key development factors across the cities.

Each city has been judged by 14 indicators, with the lowest score of 1 point and the highest score of 40 points, except for two indicators (see Annex Table A and B).

Table 1 below lists 40 cities by ranking with a total score of 14 indicators.

Table 1.

General ranking of 40 cities of CA and the Caucasus

Position	City	Point
1	Nur-Sultan	390
2	Baku	384
3	Tbilisi	382
4	Aktau	379
5	Ashgabat	366
5	Batumi	366
6	Atyrau	365
7	Almaty	349
8	Tashkent	342
9	Uralsk	299
10	Shymkent	293
11	Aktobe	291
12	Oskemen	281
13	Pavlodar	279
13	Yerevan	279
14	Navoy	277
15	Kokshetau	275
16	Dushanbe	267
17	Karaganda	266
18	Bishkek	264
19	Khudzhand	257
20	Kutaisi	251
21	Kyzylorda	249
22	Ganja	248
23	Kostanay	237
23	Dzhizzak	235
24	Andizhan	231
25	Urgench	231
26	Bukhara	225
27	Termez	218
28	Nukus	217
29	Taldykorgan	214
30	Namangan	213
31	Samarkand	196
32	Turkestan	192
33	Petropavlovsk	191
33	Fergana	191
34	Karshi	190
35	Taraz	186
36	Osh	183

This table shows that Nur-Sultan ranks number one with a total score of 390 points. Nur-Sultan's leading position is based on the fact that all cities were not evaluated by statistical data, but rather specifically judged in relation to the population (per capita). For example, the city ranks the 6th in its population and the 4th in the total GRP.

The last position in the ranking has the Osh city with a total score of 183 points.

Even with 14 indicators served as a basis for the calculation of the overall ranking, the cities' indicators in 5 directions differ significantly.

Below is a detailed review of the rating across each of the five areas.

TECHNOLOGICAL DEVELOPMENT AND HUMAN CAPITAL

The evaluation of 40 cities over the level of Technological Development and Human Capital (TDHC) includes the following two indicators: 1) HDI ranking and 2) per capita R&D ranking.

The average level of HDI for 8 countries of CA and the Caucasus is 0.752. It calculated based on national indicators of countries. The average amount of R&D expenses across 40 cities in the review is 221 million USD, while the average per capita R&D costs are 10,4 US dollars. These are unquestionably very low figures for the region.

For example, according to the Administration of Paris, more than 23,7 billion USD was spent on R&D in 2018, which is almost 107 times more than the average cost of 40 cities in the review. It needs to be noted that in 2018 Paris created 161 thousand R&D jobs, which included 112,5 thousand jobs for researchers.

It can be seen from Table 2 that Nur-Sultan and a number of cities in Kazakhstan are leading TDHC overall ranking.

R&D expenses in Nur-Sultan reached 70.9 million USD in 2018, with per capita R&D expenses amounting to 68.8 USD, which became the best among the 40 cities of the review and roughly 6.5 times higher than an average indicator.

Table 2.

Technological Development and Human Capital of 40 cities in CA and the Caucasus, by points

Nur-Sultan	31
Aktau	30
Almaty	29
Atyrau	28
Baku	27
Aktobe	27
Oskemen	26
Tbilisi	26
Kokshetau	25
Batumi	25
Karaganda	24
Kostanay	23
Ashgabat	22
Kutaisi	21
Yerevan	20
Uralsk	19
Navoy	18
Ganja	18
Pavlodar	17
Tashkent	17
Shymkent	16
Taraz	15
Khudzhand	14
Bukhara	13
Bishkek	12
Karshi	11
Kyzylorda	10
Andizhan	10
Dushanbe	9
Dzhizzak	9
Urgench	8
Samarkand	7
Taldykorgan	6
Termez	5
Turkestan	4
Osh	4
Nukus	4
Petropavlovsk	3
Fergana	2
Namangan	1

In addition, Kazakhstan ranked first in the Human Development Index in a group of 8 countries with an indicator of 0.800 in 2018. This enabled many cities in Kazakhstan to get higher positions in TDHC ranking.

The last place in the TDHC ranking is Namangan. The city's per capita costs of R&D are 1,5 USD. This is roughly 45 times lower than Nur-Sultan's figure.

It needs to be noted that the lowest HDI among the 8 countries is attributed to Tajikistan, where it is equal to 0.650. In a per capita R&D ranking, Petropavlovsk comes the last with the lowest indicator (1,165 USD).

The TDHC rating of the cities is based on 2 indicators, which has significantly impacted the performance of many cities in the review. For example, Dushanbe, which comes 16th with a score of 267 points in the general ranking, decreased to the 23rd place in TDHC with a total score of 9 points (see Table C).

It can be seen from Table 2 that Batumi that used to be the 5th in the general ranking moved to the 7th place and now shares it with Kokshetau with 25 points.

Table 3 provides an insight into each indicator of the TDHC. Even though Dushanbe has the lowest HDI in the ranking, since, according to UNDP, Tajikistan's HDI is the lowest in the region and is 0.650 points; the city ranks 26th in per capita R&D expenditures with 15 points and, accordingly, with 2,4 USD per capita (Table 3-A).

The city of Ashgabat also ranks one of the lowest in HDI, since the UNDP HDI index for Turkmenistan is only 0.706 points (3 out of 8 points), however, in per capita R&D expenditures, the city ranks the 9th with 32 points out of 40 and, accordingly, with 13,7 USD per capita. This suggests that Turkmenistan begins to focus more on technological development and incurs more budget expenditures on R&D.

It should be noted that the highest HDI is attributed to the cities of Kazakhstan, while it is said to be at a minimum in the cities of Tajikistan. The cities of Kazakhstan are ahead of other cities in per capita R&D expenditures. However, the R&D rating list ends with 2 cities of Kazakhstan - Petropavlovsk and Turkestan cities (Table 3-A).

In general, according to UNESCO, the global R&D expenditures reached a historical record with 1.7 trillion USD in 2017. The main share is taken up by 10 leading countries, which account for 80% of all expenditures.

Table 3.

Technology Development and Human Capital of 40 cities in CA and the Caucasus based on 2 indicators, by points

Nur-Sultan	8	40
Aktau	8	39
Almaty	8	38
Atyrau	8	36
Aktobe	8	35
Baku	6	37
Oskemen	8	33
Tbilisi	7	34
Kokshetau	8	30
Batumi	7	31
Karaganda	8	29
Kostanay	8	28
Ashgabat	3	32
Kutaisi	7	27
Yerevan	5	26
Uralsk	8	22
Ganja	6	23
Navoy	4	25
Pavlodar	8	20
Tashkent	4	24
Shymkent	8	19
Taraz	8	16
Khudzhand	1	21
Bukhara	4	17
Bishkek	2	18
Karshi	4	14
Kyzylorda	8	9
Andizhan	4	13
Dzhizzak	4	12
Dushanbe	1	15
Urgench	4	11
Samarkand	4	10
Taldykorgan	8	5
Termez	4	7
Turkestan	8	2
Nukus	4	6
Osh	2	8
Petropavlovsk	8	1
Fergana	4	4
Namangan	4	3

With an average volume of 221 billion USD, the share of 40 cities of CA and the Caucasus is only 0.013%. Such a level of R&D expenditures may not adequately meet the needs of the modern economy of the cities of CA and the Caucasus. What is needed is a completely new approach for financing and developing research. This should take the economies of cities in CA and the Caucasus to a new level of economic and trade development.

Table 3-2.

Total per capita R&D expenditures in 40 cities of CA and the Caucasus, USD

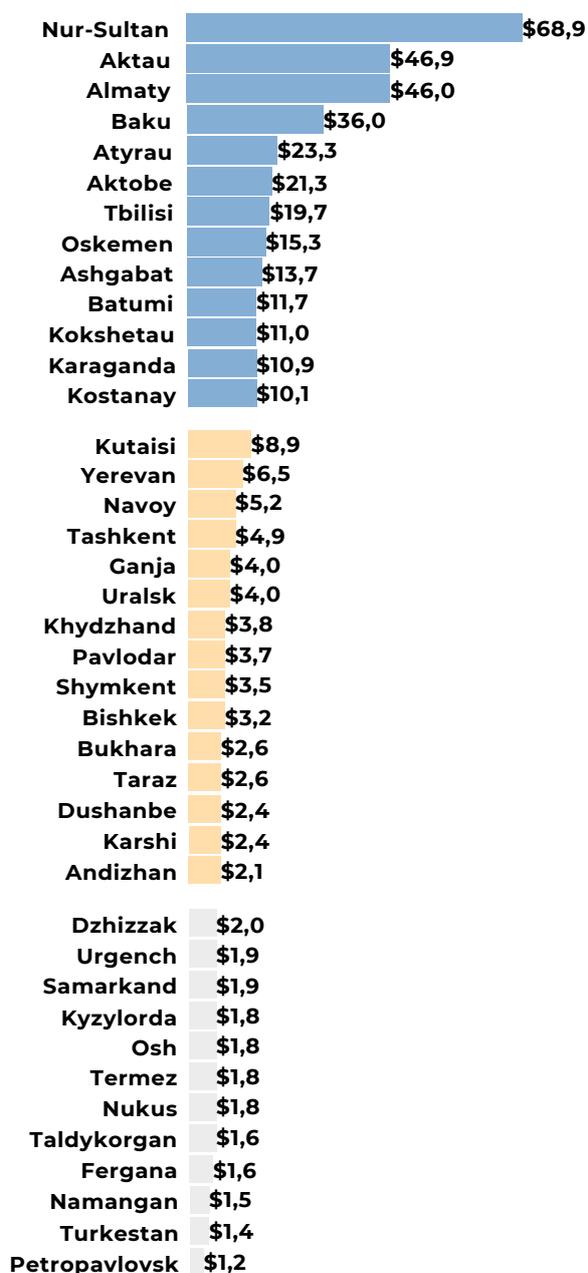


Table 4 provides the top 10 cities with the best positions in technological development and human capital.

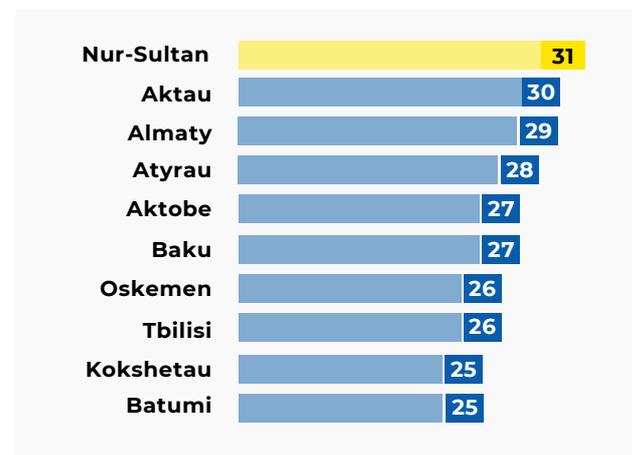
The top 10 cities with the best positions in technological development and human capital include the following numbers of cities by country as below:

- Kazakhstan - 7 out of 17 cities;
- Georgia - 2 out of 3 cities;
- Azerbaijan - 1 out of 2 cities.

These findings show that the cities of Kazakhstan, Georgia, and Azerbaijan score higher in technological development and the human capital than other cities in the region.

Table 4.

Top 10 cities with the best Technological Development and Human Capital, by points



Even though these cities score well and are in the top 10, it must be remembered that there have been limited statistics on the official websites of authorities. For example, details of R&D costs have been retrieved from analytical resources. HDI figures have been taken from the website of international organizations.

The reason for low HDI indicators in many cities is because updated statistics on the internet are available only for countries. However, in fact, the HDI of many capitals is significantly different from regional cities.

ECONOMIC POTENTIAL

The most important contributor to economic potential is GDP or GRP of cities and regions. In 2018, the world's GDP according to the World Bank was 84.8 trillion USD.

In 2018, the total GRP of 40 cities of CA and the Caucasus was 275.9 billion USD or 0.32% of the global GDP. It is slightly more than the GDP of 15-million population of Istanbul (2017) with 252 billion USD. When compared to global megacities, top 40 Central Asia and Caucasus cities don't even produce half of the GRP of the largest cities.

According to Quartz (2016), the GRP of Tokyo in 2014 was 1.6 trillion USD, New-York - 1.4 trillion USD, Los-Angeles - 860 billion USD, Seoul-Incheon - 846 billion USD, London - 836 billion USD, Paris - 715 billion USD, Beijing - 447 billion USD (Caixin, 2019).

Overall, the evaluation of economic potential of the cities under this review relied on the following indicators: 1) per capita GRP; 2) per capita investments; 3) number of tourists per capita; 4) number of small businesses per capita; 5) average salaries; 6) balance of migration in relation to the population.

Table 5 shows the level of economic potential of 40 CA and Caucasus cities.

According to the analysis, the average per capita GRP of 40 cities is 6155.5 USD; the average level of per capita investments is 1439.7 USD; the average salary is 334 USD; the average number of per capita tourists is 0.543; the average ratio of small businesses to the population is 1.05%; and the average ratio of migration to population is 0.01%.

The average indicators suggest that the region of CA and the Caucasus is still in a socially vulnerable zone, even though there are cities in the region that lead in economic indicators.

The leading position in the economic potential rating is held by Nur-Sultan (1st place - 36 points). The city is one of the best in 6 indicators, such as per capita GRP - 17380.1 USD (3rd place), per capita investments - 3004.8 USD (4th place), average salaries - 697.2 USD (3rd place), number of tourists per capita - 0.745 (9th place), number of small businesses in relation to the population - 3.97 % (1st place) and the balance of migration + 2.34% (3rd place).

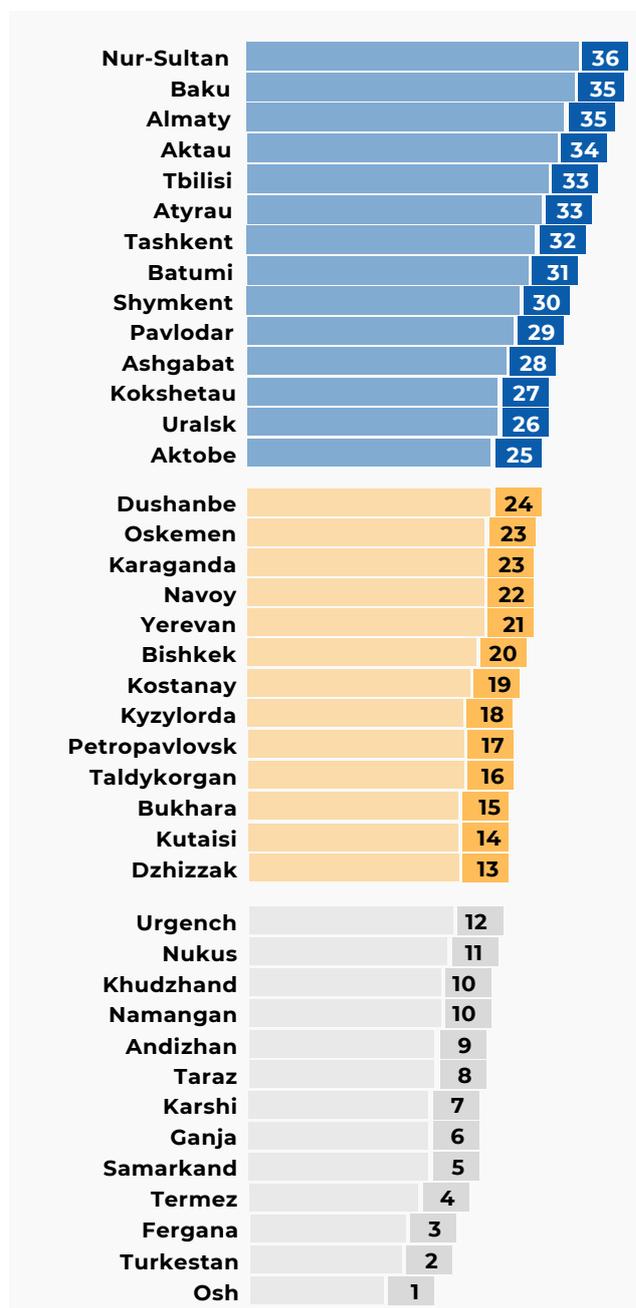
Among the capitals of the CA and Caucasus countries, the leading positions are held by Baku (2nd place), Tbilisi (4th place) and Tashkent (5th place). Ashgabat city ranks 9th, Dushanbe - 13th, Yerevan - 16th and Bishkek city comes 17th.

Several cities have lost their position in the economic potential rating. For example, Tbilisi came the 3rd (-1 position), Ashgabat - 6th (-3 position), Yerevan - 15th (-1 position).

Tashkent, which came 9th in the general rating, ranks 5th in economic potential (+4 positions). Dushanbe, which came 18th in the general ranking, ranks 13th in economic potential (+6 positions).

Table 5.

Economic potential of 40 cities of CA and the Caucasus, by points



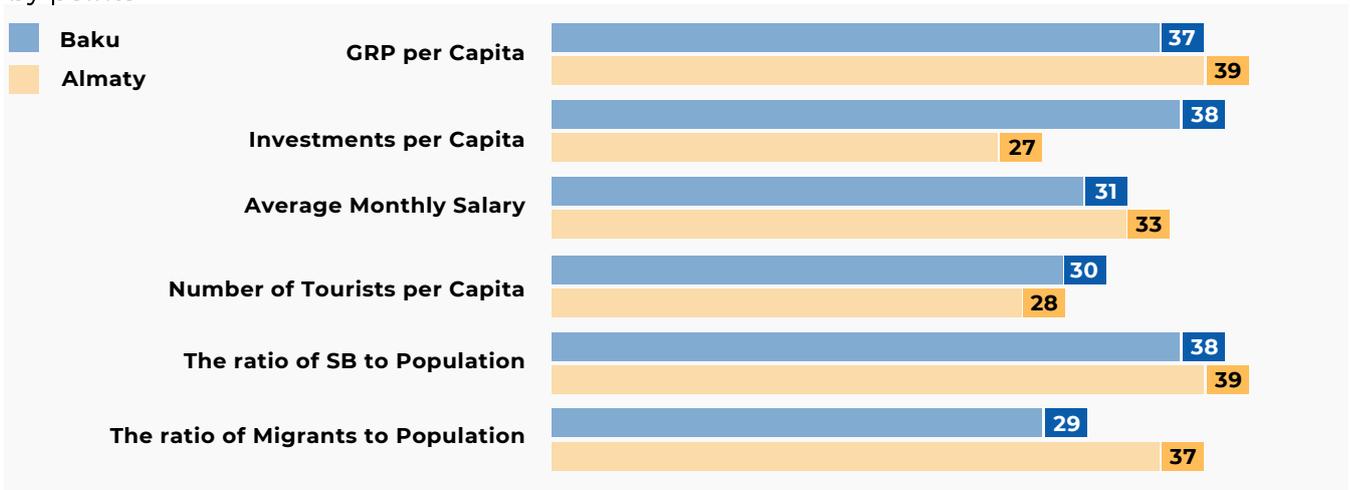
In general, the CA and Caucasian cities have low scores in economic potential. In order to compete with the big cities of the world, the cities of CA and the Caucasus need to focus on the new growth points.

For example, the cities of the Baltic region rank higher, e.g., according to the official statistics of Estonia, Tallinn's per capita GRP is 29,224 US dollars, per capita investments – 37,895 USD, average salaries – 1,383 USD, the number of tourists per capita - 10.68. In other words, Tallinn's economic potential figures are higher than the best indicators of cities in Central Asia and the Caucasus.

In an economic potential ranking, Almaty and Baku come second (Table 5-2).

Table 5-2

Economic potential of Almaty and Baku, by points



Almaty is the best in 6 indicators, such as per capita GRP amounting to 20,381.5 USD (3rd place), per capita investments – 1,179.9 USD (14th place), average salaries - 582.9 USD (4th place), average number of tourists per capita - 0.622 (12th place),

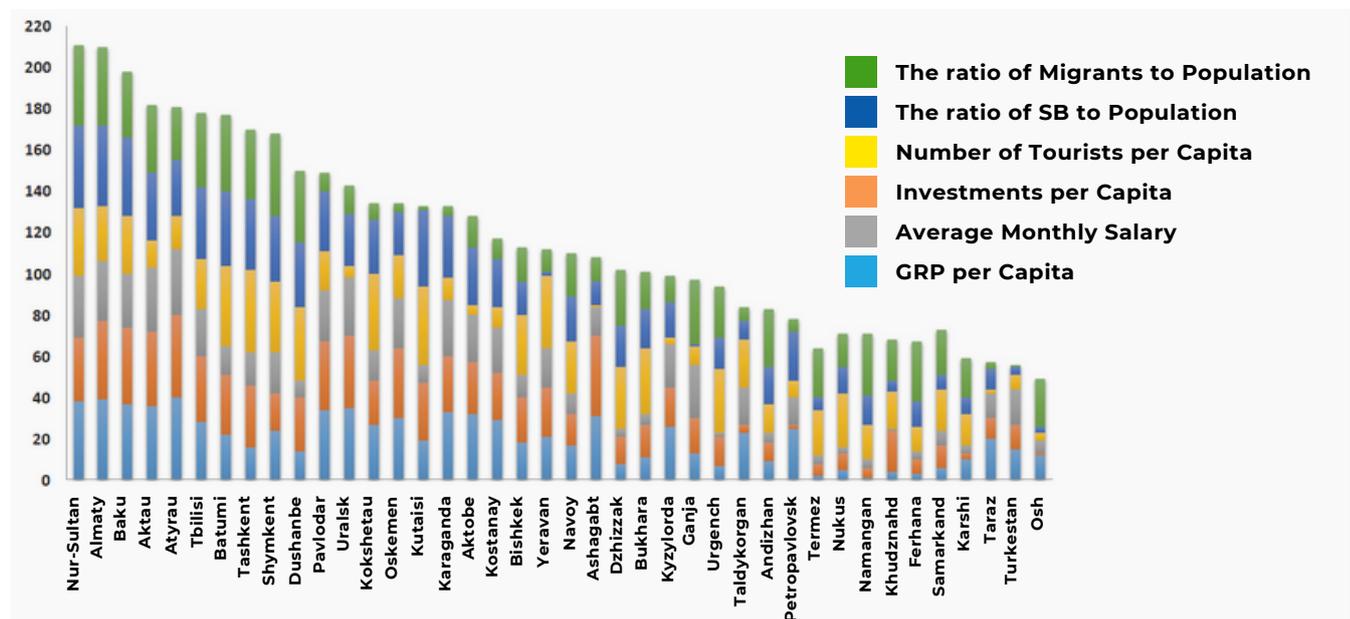
average number of small businesses in relation to the population - 3.46% (2nd place) and the average migration balance ratio + 1.84% (4th place).

Baku also has high scores in economic potential. Its per capita GRP is 16,355.4 USD (4th place), per capita investments - 3,085.73 USD (3rd place), the average salaries are 462.1 USD (6th place), number of tourists per capita is 0.698 (11th place), number of small businesses in relation to the population - 2.77% (3rd place) and the average ratio of migration balance + 0.007% (12th place).

Table 5-2 demonstrates that Almaty excels city of Baku in 4 indicators of economic potential. Baku is the leader in 2 indicators.

Table 6.

Economic potential across 40 cities in CA and the Caucasus, based on 6 indicators



However, Baku is well ahead of Almaty when it comes to investment amounts (by 11 points). The per capita investments, in general, enable Baku to maintain a high level of overall economic potential along with Almaty.

The lowest rating in economic potential is held by the city of Osh (36 out of 36, with the same scores held by several cities).

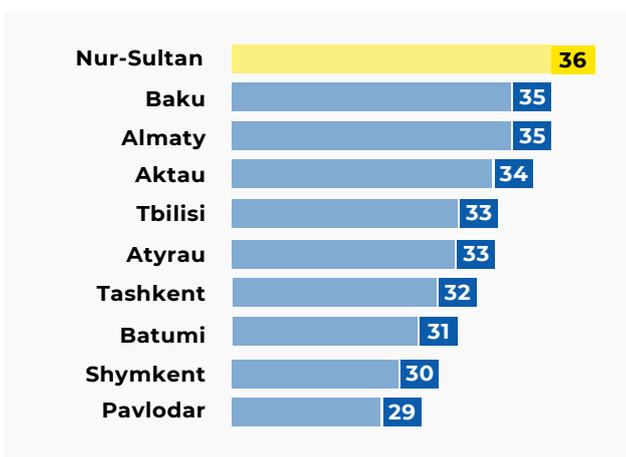
Even though per capita GRP of Osh is 1,642 USD (30th place out of 40 countries), its other indicators are even lower. The per capita investments of Osh are 272.5 USD (34th place out of 40 countries). For example, the city attracted only 20,100 USD of foreign direct investments for the whole of 2018. The average salaries are 200.5 USD (29th place out of 40), with 0.111 tourists per capita (39th place out of 40).

We can infer from Table 6 that Almaty and Aktau rank the highest in economic potential versus most capitals of Central Asian countries, except for Nur-Sultan and Baku.

Table 7 reflects the top 10 cities with the highest economic potential rating.

Table 7.

Top 10 cities with economic potential, by points



The list of top ten cities with the highest economic potential includes the cities of the following countries:

- - Kazakhstan - 6 out of 17 cities;
- - Azerbaijan - 1 of 2 cities;
- - Georgia - 2 out of 3 cities;
- - Uzbekistan - 1 out of 12 cities.

These cities have a number of competitive economic advantages and are attractive for living.

TRADE POTENTIAL

According to the World Integrated Trade Solutions (2017), global exports in 2017 totaled 17.8 trillion USD, with imports amounting to 16.1 trillion USD. In 2017, the EU produced the largest export volumes in the world (31.5% of the total amount), the 2nd was China (12.1%), followed by the United States (9.0%), Germany (7.86%), Japan (3.85%), South Korea (3.24%), and France (3.1%).

The total export of 40 cities in CA and the Caucasus has reached 82 billion USD or 0.46% of the world exports, with the import of 40 cities totaling 56 billion USD or 0.34% of the global volume. Overall, the total exports of 40 cities are slightly less than those of Iran (91.9 billion USD) and slightly more than Slovakia's 80.5 billion USD of exports.

Compared to Paris, 40 cities of CA and the Caucasus have lower scores. For example, Paris Region with a population of 12.1 million exported products and services totaling to 101 billion USD in 2018. Singapore with a population of 6 million exported 373 billion USD in products in 2018, which exceeds the export of 40 cities in Central Asia and the Caucasus by 4.5 times.

In general, an assessment of the trade potential of 40 cities under review helps reveal new leaders, and evaluate the strengths and weaknesses of the cities' trade potential.

The following three indicators have been used to evaluate the trade potential: 1) per capita export; 2) per capita import; 3) balance of exports and imports per capita.

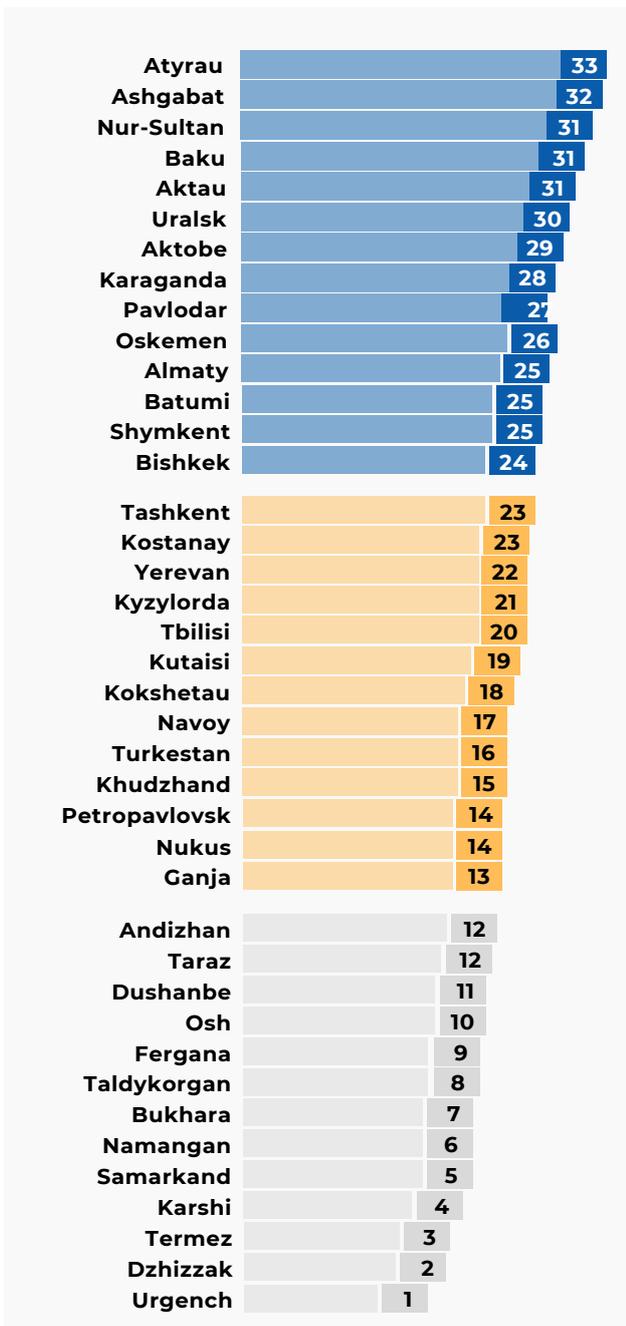
The average per capita exports across 40 cities of Central Asia and the Caucasus are 2,335.5 USD, the average per capita imports for 40 cities are 1,097 USD, while the balance of exports and imports per capita is 1238.5 USD.

For comparison, per capita exports in Paris are 8,348 USD, and imports are 13,705 USD. However, it should be noted that there are cities in CA and the Caucasus with even better results.

For example, Atyrau is the leader in trade potential, and this is because Atyrau Region is one of the main suppliers of energy resources to international markets. The city's per capita exports are 38,372 USD (1st place in the export rating), per capita imports equal 4,708 USD (1st place in the import rating), the balance of exports and imports per capita is 33,663.8 USD (1st place in the per capita balance of exports and imports).

Table 8.

Trade potential of 40 cities in CA and the Caucasus



However, there are only 2 cities with per capita export figures better than those of Paris: Atyrau and Uralsk (see Table A), and this is because these cities primarily export energy resources.

The last line in trade potential rating belongs to Urgench. While Urgench ranks 20th in the balance of exports and imports (-37.6 US dollars per capita), the city demonstrates virtually the lowest positions in the other 2 indicators. For example, the per capita exports are 56.55 USD (40th place), and per capita imports are 94.17 USD (40th place).

Interestingly, the 3rd place is held by three cities with 31 points. These are Nur-Sultan, Baku, and Aktau. While high trade potential positions for the capital cities of Azerbaijan and Kazakhstan are naturally anticipated, the position of Aktau ranking third may seem quite curious. Along with Atyrau, Aktau is one of the biggest oil suppliers in the region. In addition, the port of Aktau is a major transit hub in the region. This is why Aktau's trade potential is so high.

Out of all the capitals of the countries of CA and the Caucasus, Dushanbe demonstrates the lowest trade potential (23rd position out of 33), with Ashgabat (2nd position out of 32), Nur-Sultan (3rd position out of 31) and Baku (3rd out of 31) ranking the highest. Of the three capitals with high trade potential ratings, only Nur-Sultan does not sell energy resources.

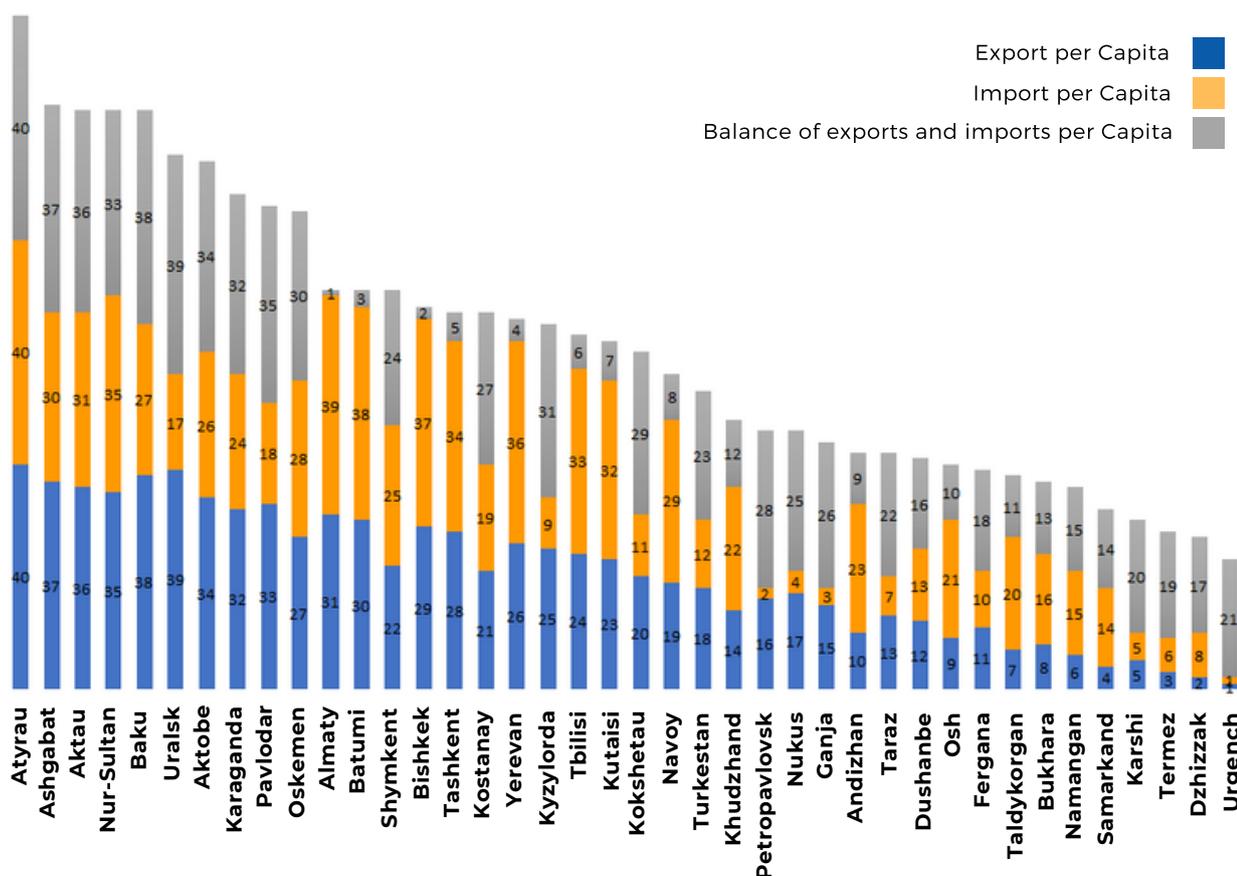
It can be seen from Table 8 that 10 cities of Kazakhstan are at the top of 40 cities of CA and the Caucasus in terms of trade potential.

The cumulative value of trade potential has also been influenced by the balance of exports and imports. For example, Batumi, which scores high in exports and imports, has got nearly the lowest points in the balance of exports and imports. This brought Batumi to the 12th line in the overall rating (Table 9).

Table 10 provides the top 10 cities with the strongest trade potential.

Table 9.

Trade potential across 40 cities in CA and the Caucasus, based on 3 indicators, by points

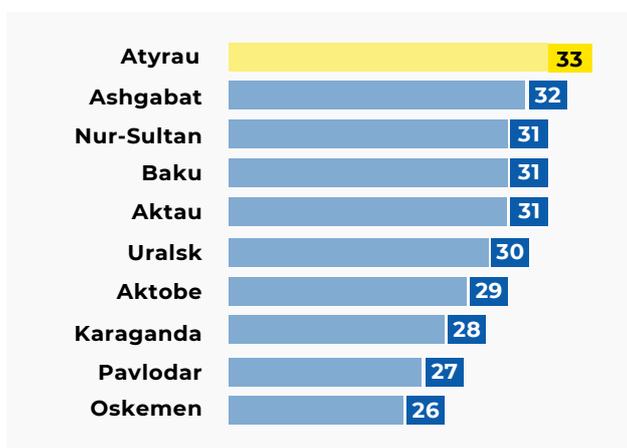


The top 10 cities with the best trade potential include 8 cities of Kazakhstan, and the capital cities of Turkmenistan and Azerbaijan.

These cities have competitive advantages in manufacturing demanded products, and exports of raw materials and resources.

Table 10.

Top 10 cities with the trade potential, by points



ENVIRONMENTAL EMISSIONS

The environmental emissions rating is based on 2 indicators: 1) emissions per capita; 2) total emissions of the city.

The total volume of emissions produced by 40 cities of the countries of Central Asia and the Caucasus reached 1.3 million tons, with 77.8 kg of average emissions per 1 person.

Just to compare, emissions produced by stationary sources in Russia in 2017 reached 17.4 mln tons, with Moscow – the largest city with 12 mln people – having produced 0.6 mln tons.

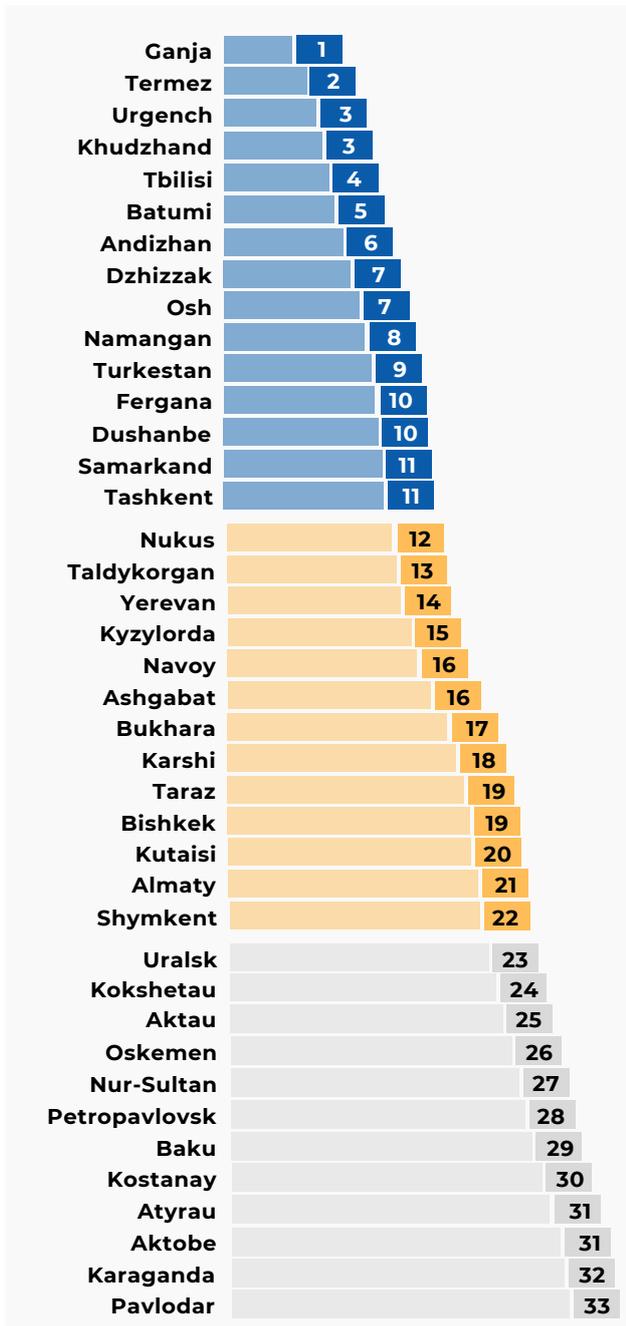
According to the Statistical Review of World Energy (2017), the world’s total carbon dioxide emissions amounted to 33.4 billion tons in 2017. In 2017, China demonstrated the largest CO2 emissions in the world (27.6% of the total amount), followed by the United States (15.2%), India (7.0%), Russia (4.6%) and Japan (3.5%).

The average environmental emissions in kg per capita reached 77.8 kg across 40 cities in 2018, with 31.7 thousand tons per 1 city of average total emissions.

When comparing the per capita emissions in 40 cities under review with those of other cities, Moscow demonstrates 5.2 kg, Minsk - 9.27 kg, and Tallinn - 16.0 kg.

These figures, of course, suggest that the cities of CA and the Caucasus have outdated energy production and use technologies. Yet, there are some cities in the region that perform better.

Table 11.
Emissions ranking of 40 cities in CA and the Caucasus



In a low emissions rating of 40 cities, for example, Ganja (Azerbaijan) is the leader with the total score of 33 (Table 11). The city's volume of emissions in kg per capita is 0.6 kg (1st place), and the total emissions of the city are 200,000 kg only (1st place).

As for the worst positions, Pavlodar shows the highest level of environmental emissions, thus, ranking 33rd with 1 point. The city's volume of emissions in kg per capita is 940.2 kg (40th place), and the city's total emissions are 315 thousand tons in 2018 (40th place).

The lowest emissions among the capitals of CA and Caucasus countries are shown by Tbilisi (4th place out of 33), with 1.64 kg of emissions per capita (2nd place), and 1.9 thousand tons of total city emissions (8th place).

Baku (29th out of 33) ranks the worst among the capitals of CA and the Caucasus. The city's volume of emissions in kg per capita is 60.5 kg (30th place), with 137 thousand tons of total city emissions (38th place).

Table 12 shows that the lowest environmental emissions are mostly performed by the cities that have the lowest economic and trade potential scores.

Pavlodar has the lowest score with the total score of 2 (40th place in the rating on two indicators). Karaganda has also received a low score - 2 out of 40 points for each indicator, with a total score of 4 (39th place in the rating in 2 indicators).

According to tables 11 and 12, the best positions on environmental emissions are mostly held by the cities of Uzbekistan, Georgia, and Kyrgyzstan.

The lowest scores are mainly with the cities of Kazakhstan, where five of such cities are at the end of the list.



Table 12.

Environmental emissions ranking across 40 cities of CA and the Caucasus based on 2 indicators, by points

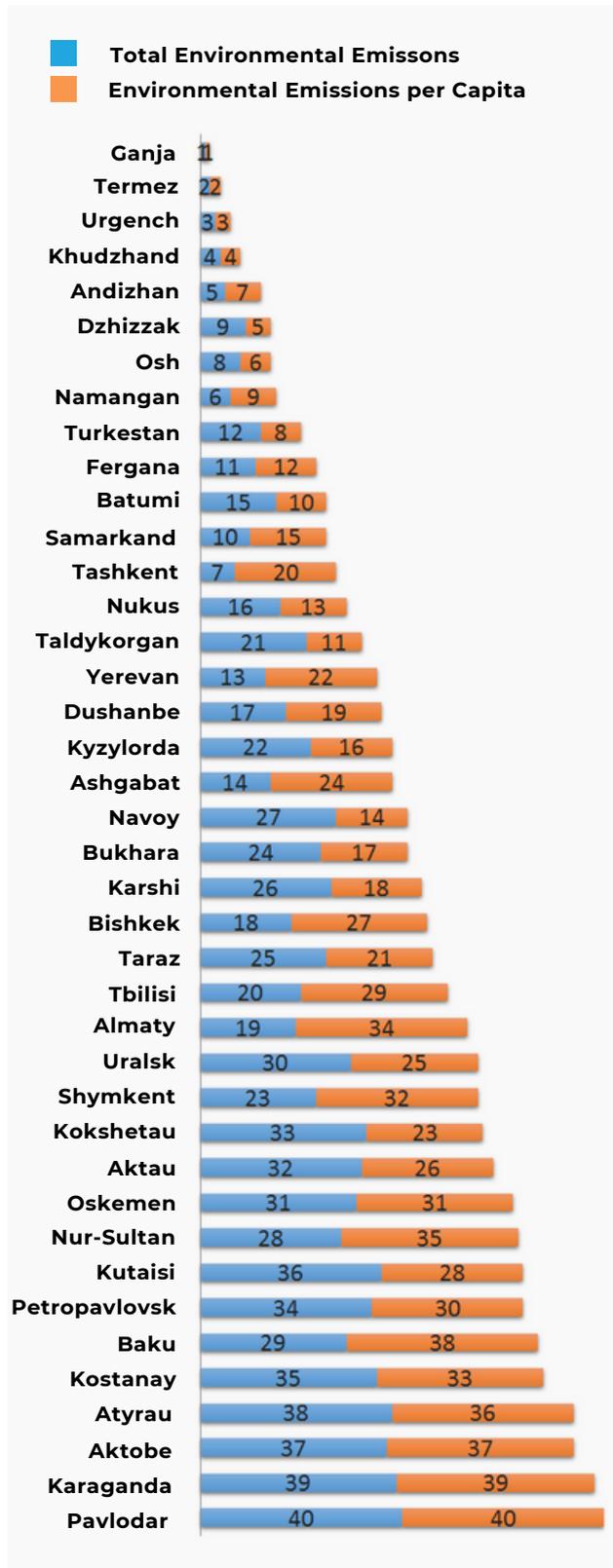
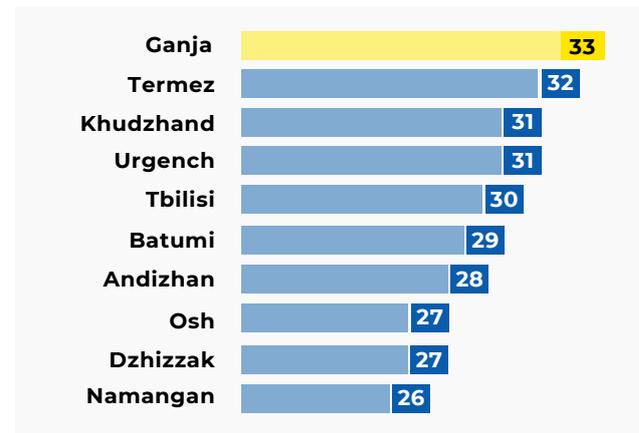


Table 13 provides the top 10 cities with the lowest environmental emissions.

Table 13.

Top 10 cities with the lowest level of environmental emissions, by points



The cities of the following countries made up the top 10 cities with the lowest environmental emissions:

- Uzbekistan - 5 out of 12 cities;
- Azerbaijan - 1 out of 2 cities;
- Georgia - 2 out of 3 cities;
- Tajikistan - 1 out of 2 cities;
- Kyrgyzstan - 1 out of 2 cities;

The analysis has concluded that cities with high environmental emissions scores also demonstrate lower economic or trade potentials and vice versa.

CRIME RATE

The crime rating is based on 1 indicator – the number of reported crimes in relation to the population.

The average ratio of reported crimes to the population in 40 cities of the countries of CA and the Caucasus is 0.88%.

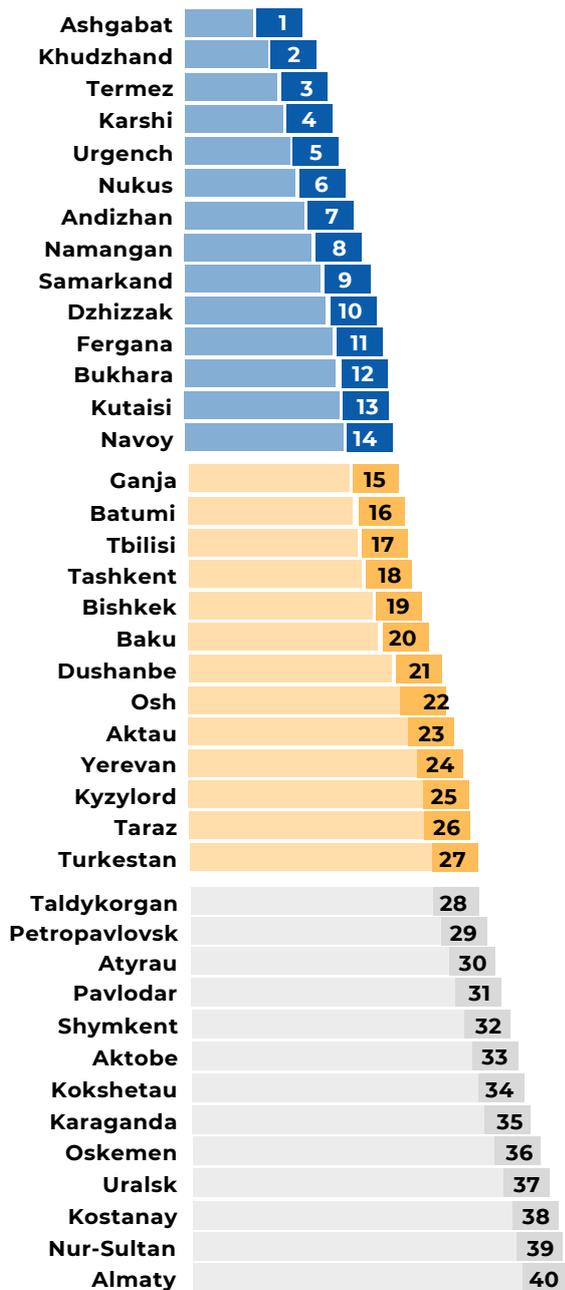
For example, this rate in Minsk is 0.85%, and in Paris - 0.19% (2016). In Japan, the ratio of registered crimes to the population is 0.72% (2017).

Ashgabat has the best records in the ratio of reported crimes to the population (0.01%) among the 40 CA and Caucasian cities. The city has earned the highest score of 40 points. (Table 14).

Almaty has the highest ratio of crimes in relation to the population. The city's rate is 3.64%, which is almost 5 times more than the average in Japan and 20 times more than in Paris.

Table 14.

Crime rate ranking across 40 cities of the countries of CA and the Caucasus



We can see from Table 14 that virtually all of the cities of Kazakhstan have the highest crime rates in relation to the population.

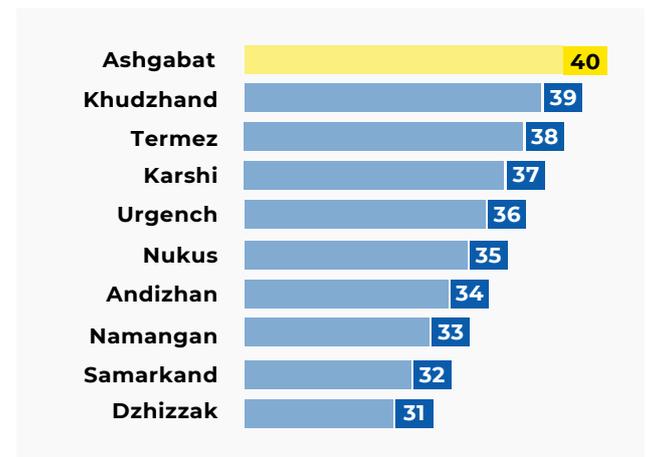
Among the cities of Kazakhstan, Aktau demonstrates the lowest number of registered crimes in relation to the population with 19 points (23rd place).

Among the capital cities of CA and the Caucasus, the best indicators are held by Ashgabat (1st place out of 40) and Tbilisi (17th place out of 40). The worst situation is in Nur-Sultan (39th place out of 40).

Table 15 provides the top 10 cities with the lowest crime rates per capita. These cities have the lowest number of registered crimes in relation to the population.

Table 15.

Top 10 cities with the lowest crime rates relative to population, by points



The cities of the following countries made up the top 10 cities with the lowest crime rates in relation to the population:

- Turkmenistan - 1 city;
- Tajikistan - 1 of 2 cities;
- Uzbekistan - 8 of 12 cities.

10

THE 10 LARGEST
CITIES OF CA AND
THE CAUCASUS



10

THE 10 LARGEST CITIES OF CA AND THE CAUCASUS

This section provides an insight into a comparative analysis across the ten most populated cities of CA and the Caucasus. This list includes 8 capitals of the region and 2 cities of republican subordination in Kazakhstan.

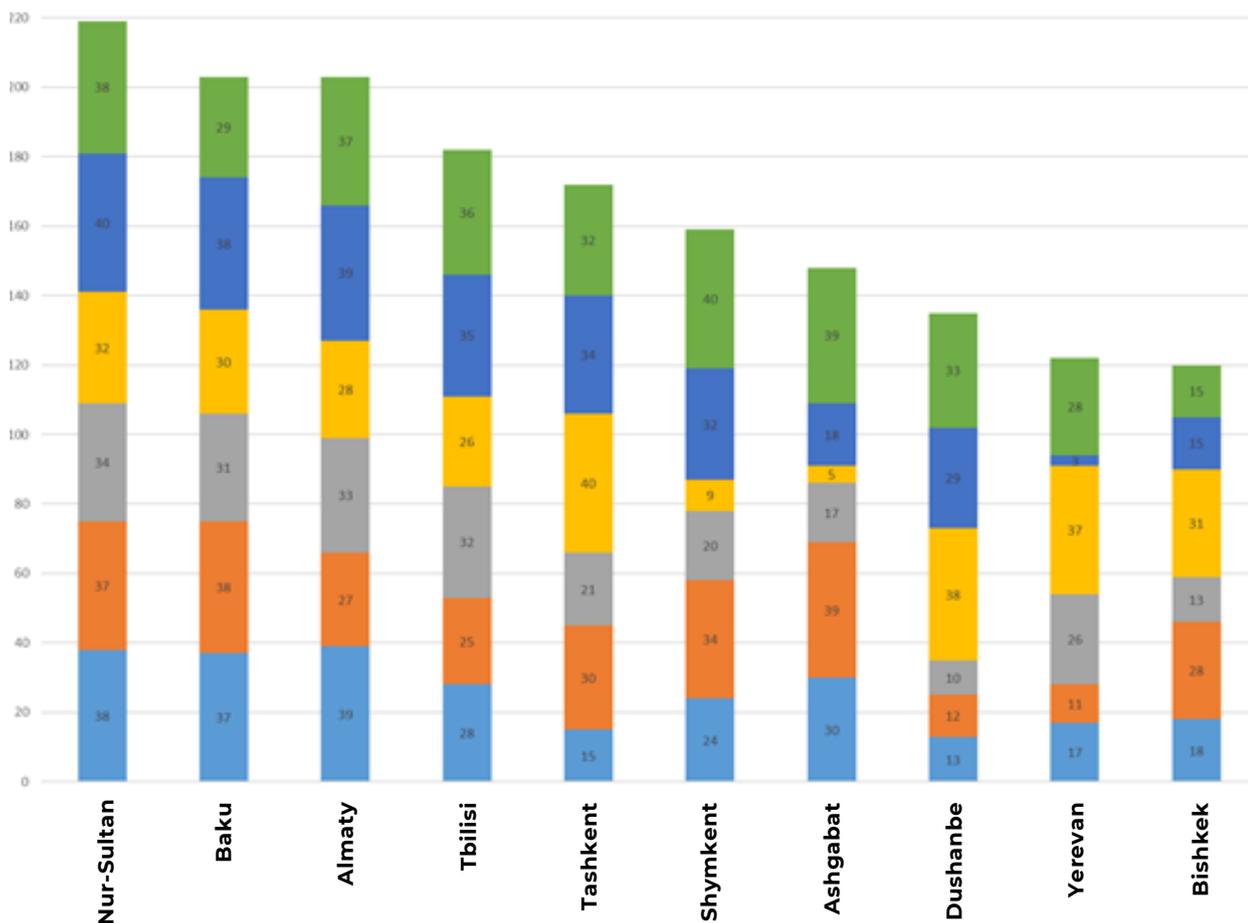
The total population of the 10 largest cities of CA and the Caucasus is 13.3 million people .

ECONOMIC POTENTIAL

We can see from Table 16 that Nur-Sultan ranks 1st in economic potential even though the city takes the 6th place in terms of population, with the second position shared between Baku and Almaty.

Table 16.

Economic potential of the 10 largest cities in CA and the Caucasus, by points



By way of illustration, in a GRP per capita, the total GRP of the 10 largest cities in the region in 2018 was 122.3 billion USD or 44.3% of the total GRP of 40 cities in Central Asia and the Caucasus. Moscow – with the population of 11.9 mln people has GRP of 238.3 billion, which is virtually twice as much as that of the top 10 cities. GRP of 12-million Paris reaches 715 billion USD, while that of 3.5-million Berlin (CEIC, 2019) is 176.4 billion USD.

Overall, GRP of the 10 largest cities of CA and the Caucasus is the same as the GDP of such country as Hungary (139.1 billion USD).

The table shows that Tashkent – the largest city in Central Asia and the Caucasus in terms of population – comes after Baku, Almaty, Tbilisi, and Nur-Sultan in economic potential and stays at the same level as Shymkent.

The lowest indicators of economic potential are attributed to Yerevan and Bishkek.

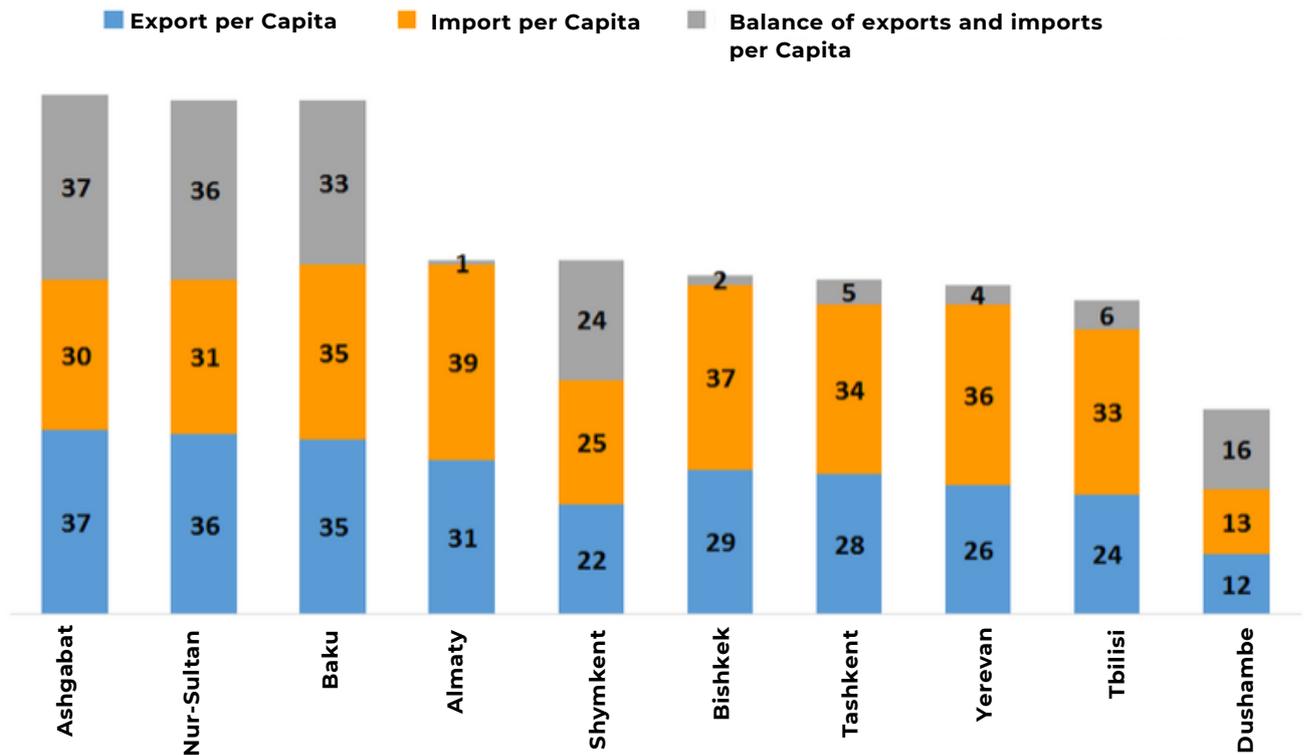
We can conclude from Table 16 that Shymkent is ahead of Ashgabat, Dushanbe, Yerevan, and Bishkek in economic potential, with Almaty inferior only to Nur-Sultan.

In a ranking of 10 cities, Ashgabat boasts one of the best export per capita rates, which is 6,320 USD (4th out of 40 countries).

In the ranking, Dushanbe comes lowest with 134.6 USD of export per capita (29th position out of 40 cities).

Table 17.

Trade potential of the 10 largest cities in CA and the Caucasus, by points



TRADE POTENTIAL

Trade potential of 10 cities in Central Asia and the Caucasus on the average exports per capita is equal to 2,262 US dollars, while the average imports per capita are 2,277 US dollars. In other words, the average rates for the 10 largest cities are slightly higher than the average for the 40 cities under review.

Overall, the exports of the 10 largest cities amount to 31 billion USD or 37.8% of all the exports delivered by 40 cities, with imports worth 34.6 billion USD - 61.7% of all the imports of 40 cities under review.

The trade potential ranking of the largest cities of the countries of Central Asia and the Caucasus places Ashgabat on top with the highest score of 32 points (Table 17). Among the 10 cities, Ashgabat has one of the best export per capita rates, which is 6,320 USD (4th out of 40 countries).

Dushanbe has lowest trade potential with 134.6 USD of export per capita (29th position out of 40 cities). Shymkent shows better trade potential than the capitals of Kyrgyzstan, Uzbekistan, Armenia, Georgia and Tajikistan, with 641.8 USD of export volume per capita (19th place out of 40 cities), and 629.15 USD of import volume per capita (16th place out of 40 cities), and 12.65 USD of exports and imports balance per capita (17th place out of 40 cities).

It needs to be noted also that the trade potential in terms of the balance of exports and imports is positive only for 4 cities: Ashgabat (4,867 USD per capita), Nur-Sultan (3,620 USD per capita), Baku (1,981 USD per capita), and Shymkent (12.65 USD per capita).

The other cities have a negative balance of exports and imports.

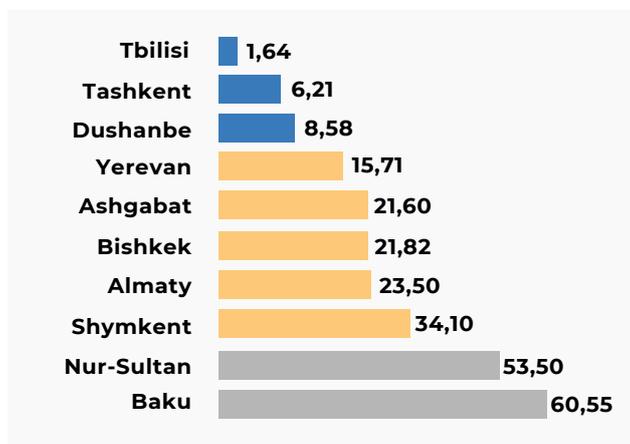
ENVIRONMENTAL EMISSIONS

The environmental emissions rate are based on two indicators: volume of emissions per capita and the total city emissions in kg. Among the 10 largest cities in Central Asia and the Caucasus, Tbilisi has the lowest emission rates, while Baku has the highest.

Table 18 shows that capital cities of Georgia, Uzbekistan and Tajikistan demonstrate the lowest environmental emissions, while those of Armenia, Turkmenistan and Kyrgyzstan have the average rates, and the capitals of Kazakhstan and Azerbaijan have the highest emission volumes.

Table 18.

Per capita emissions in the 10 largest cities of CA and the Caucasus, in kg



The environmental emissions of 10 large cities reached nearly 347.3 thousand tons in 2018. It is about 27.3% of the total emissions of 40 cities under review.

Baku with 137 thousand tons accounts for 39.4% of the total emissions of the 10 largest cities. The smallest amount is held by Tbilisi (0.5%) with 1.9 thousand tons of emissions.

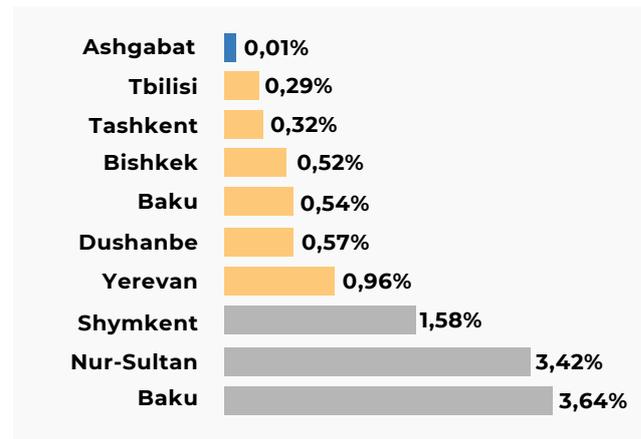
CRIME RATES

Table 19 shows the crime rate of the 10 largest cities of CA and Caucasus in relation to the population.

The average ratio between the number of registered crimes and the population in the 10 largest cities in Central Asia and the Caucasus is 1.19%. The average for 40 cities is 0.9%.

Table 19.

Crime rates in the 10 largest cities of CA and the Caucasus, in percent



According to Table 19, Ashgabat has the lowest crime rate in relation to the population (0.01%), while Almaty (3.64%), Nur-Sultan (3.42%) and Shymkent (1.58%) have the highest rates. These cities are also on top of the 40 cities in Central Asia and the Caucasus with the highest registered crimes in relation to the population.

The crime rate in relation to the population is the lowest in Tbilisi (0.29%) and Tashkent (0.32%). Compared to other capital cities, these cities demonstrate the lowest number of registered crimes in relation to the population.

TOURIST POTENTIAL

While Ashgabat has the lowest crime rate per capita, it is in the worst position on the number of tourists per capita (Table 20), which is mainly because the city and the country are less open to foreign tourists.

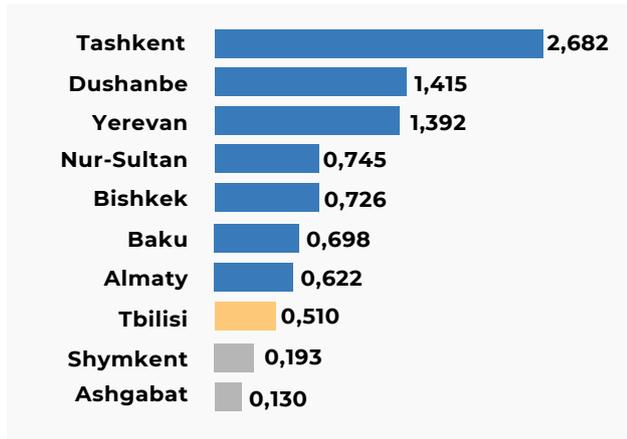
For a more detailed review, please see below an analysis of indicators of the number of tourists per capita for the 10 largest cities of CA and Caucasus.

Around 14.3 million tourists visited the 10 largest cities in Central Asia and the Caucasus. This is 44.23% of the total number of tourists who visited 40 cities of Central Asia and the Caucasus. The analysis shows that the share of the most visited cities, for example, Tashkent is 46.1%, Nur-Sultan - 5.4% and Baku - 11%.

In the number of tourists per capita, Tashkent ranks first with an indicator of 2.682. Among the capitals of the countries of CA and the Caucasus, the top cities are Dushanbe with 1.415 and Yerevan with 1.392 tourists per capita. An average number of tourists per capita in the 10 largest cities of Central Asia and the Caucasus in 2018 was 0.911.

Table 20.

The number of tourists per capita in the 10 largest cities in CA and the Caucasus



For comparison, the number of tourists per capita in Paris is 16.351, while in Tallinn the figure is 10.686. For example, Paris Region with a population of 12.1 million annually receives about 9.1 million visitors to take part in conferences and exhibition centers, and 44.9 million tourists (2018).

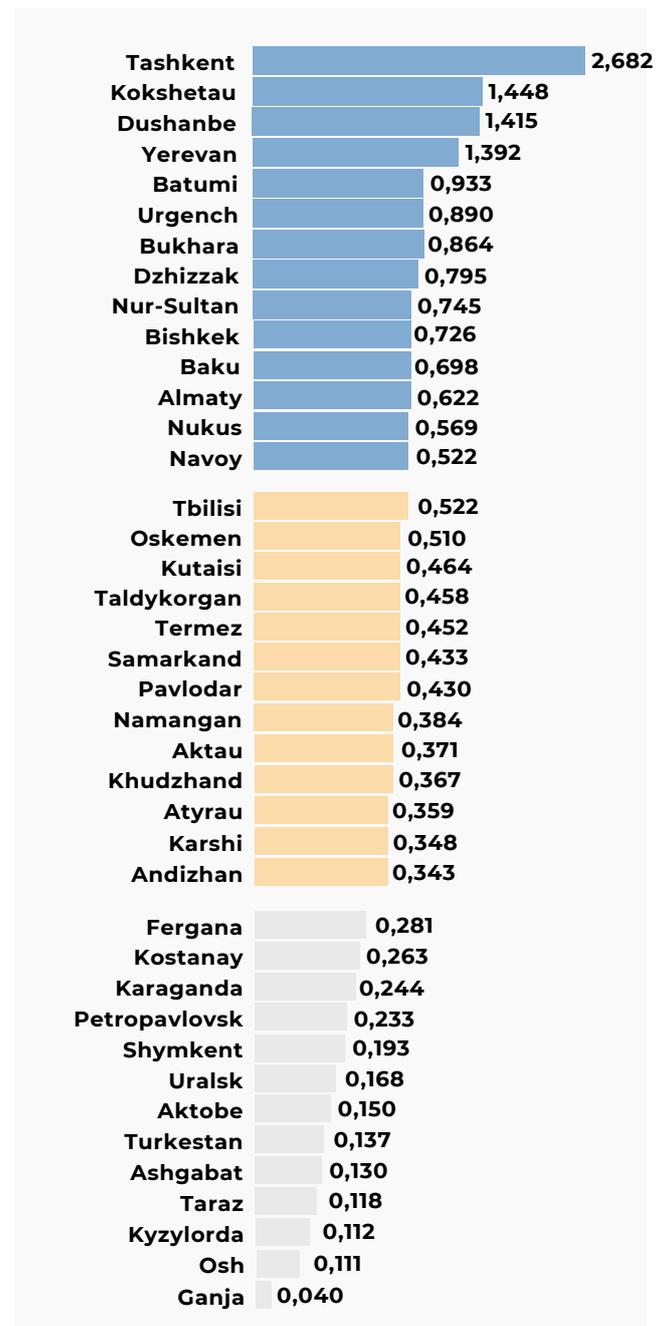
The top ten leaders in tourism potential in the overall ranking of 40 cities in CA and the Caucasus include Batumi with 0.933 tourists per capita and Urgench with 0.890 tourists per capita (Table 21).

Kokshetau ranks second in tourist potential in the overall rating of 40 cities in CA and the Caucasus, with an indicator of 1.448 tourists per capita, which is largely driven by the growing popularity of the nearby Burabay Resort (Table 21).

The development of the tourism sector is known to directly impact the development of 16 activities in the economy, and over 100 activities indirectly. In general, the development of tourism potential has a positive effect on SMEs development and household income.

Table 21.

The number of tourists per capita in 40 cities of CA and the Caucasus



The analysis of 40 cities of CA and Caucasus, as well as the top 10 largest cities, allows drawing the following conclusions:

- Cities of Kazakhstan are in the top of economic and trade potential ranking, while they demonstrate the worst positions in crime rates and environmental emissions;

- Cities of Uzbekistan, Tajikistan, and Armenia are ahead of the others in the tourists per capita rating;

- It needs to be noted that the high economic potential of the cities in Kazakhstan attracts more migrants. On the other hand, cities of Kazakhstan are on the top in terms of outflow of skilled labor to foreign countries. Thus, a positive migration balance is driven by the influx of less-educated workforce, which could have an impact on higher crime rates.

Also noteworthy is the fact that these findings have been based on the official government statistics of the countries under review, however, some countries demonstrate a lower level of openness. For example, the openness and accessibility of information in Kazakhstan, Azerbaijan, and Georgia are higher than in the other countries of the region, therefore it is important for the other countries to make their general statistics fully open and accessible.



CITIES

OF CENTRAL ASIAN COUNTRIES



CITIES OF CENTRAL ASIAN COUNTRIES

The competitiveness rating of 40 cities of CA and the Caucasus includes 33 cities of 5 Central Asian countries. The rating lists 17 cities of Kazakhstan, 12 cities of Uzbekistan, 2 cities of Kyrgyzstan, 2 cities of Tajikistan and 1 city of Turkmenistan.

The population of 34 CA cities is 16.2 mln. people, which is about 76,6% of the the population of CA and the Caucasus cities.

The GRP volume of 34 CA cities amounted to 225 bln USD or 81.5% of the GRP volume of 40 cities of CA and the Caucasus.

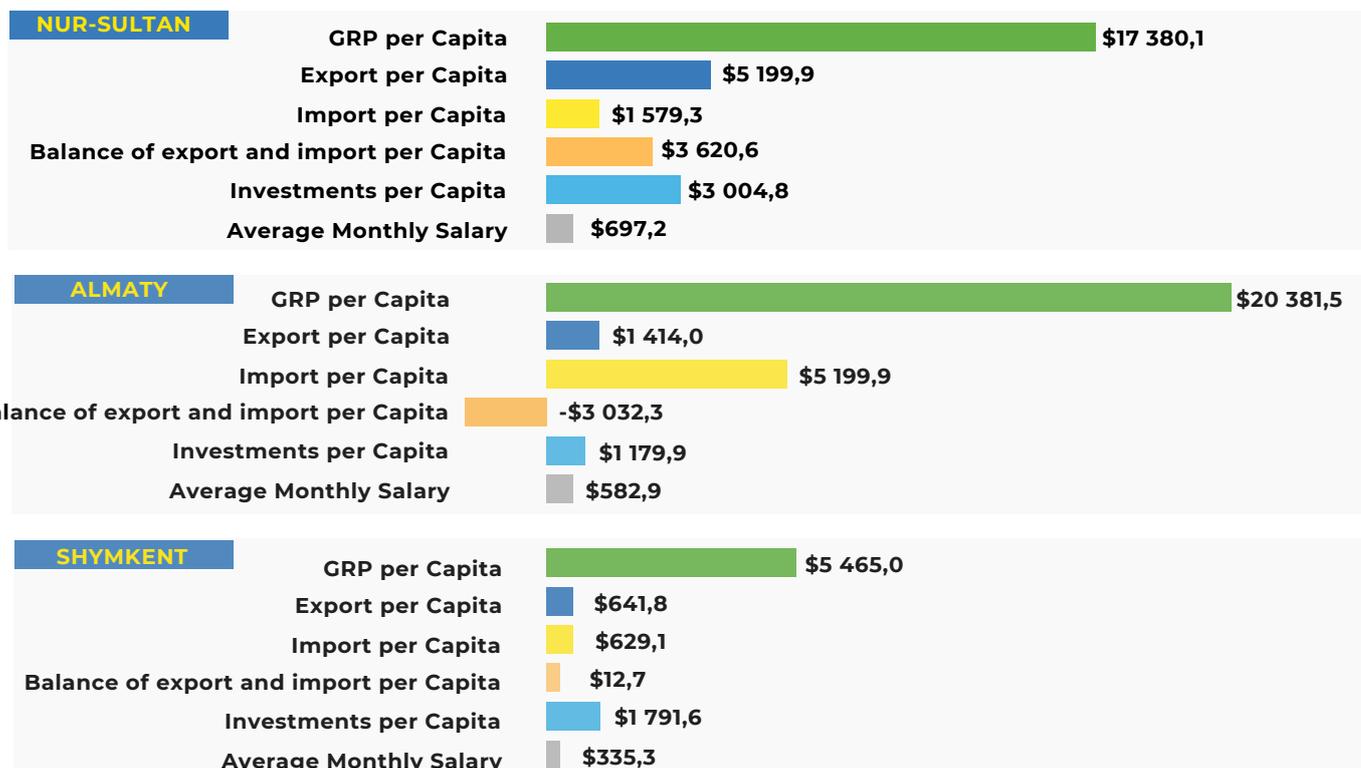
KAZAKHSTAN

Competitiveness rating of 40 CA and the Caucasus cities includes 17 cities of Kazakhstan, 3 of of them are cities of republican subordination and 14 cities are regional centers.

The population of 17 CA cities is about 7.5 mln. people, that is about 35.2% of the population of 40 CA and the Caucasus cities or 45.9% of the population of 34 Central Asian cities.

Table 22.

Performance of Kazakhstan's cities of republican subordination in 6 indicators



Kazakhstan's cities of republican subordination

Three cities of republican subordination are of highest interest. The population of the 3 cities is 50.3% of the population of 17 Kazakhstan's cities or 23% of the population of 34 CA cities.

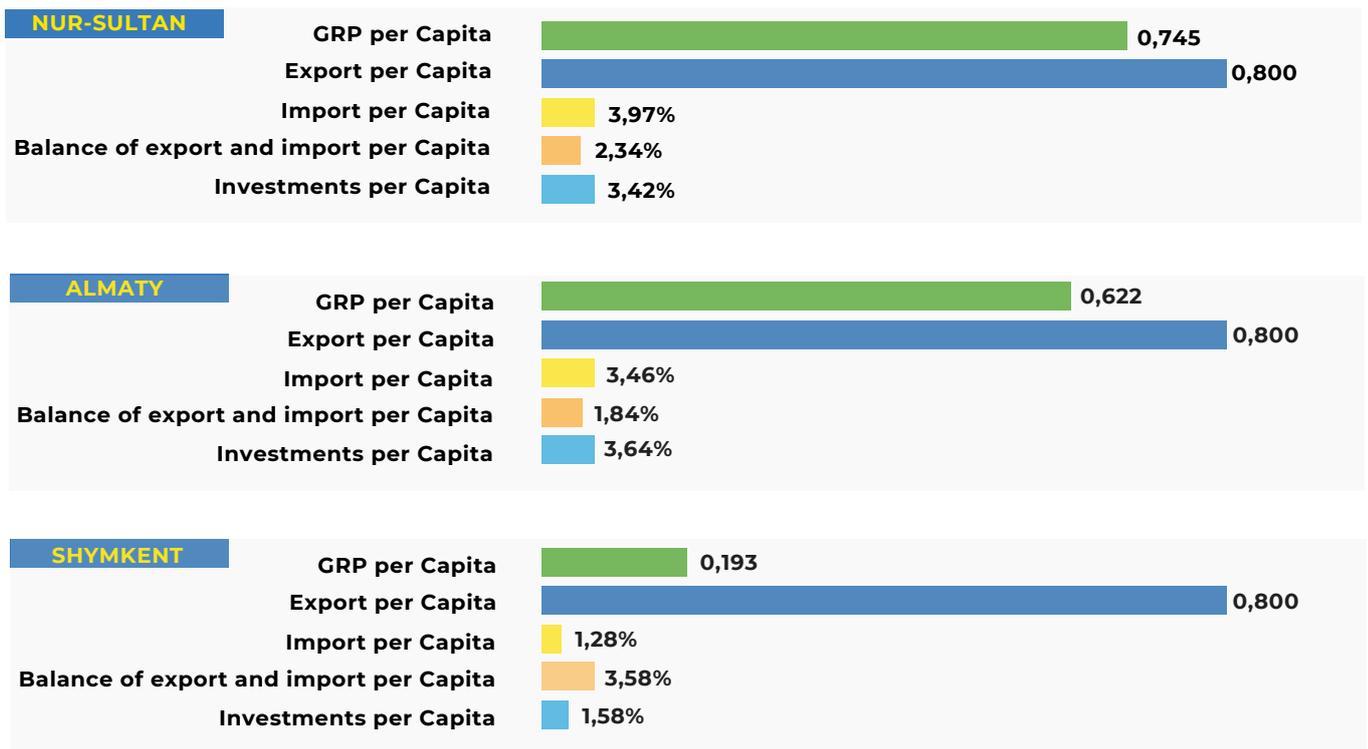
The GRP volume of 3 cities of republican subordination amounted to USD 58.5 bln. USD, or 21.2% of the GRP volume of 40 CA and the Caucasus cities, or 26% of the GRP volume of 34 Central Asian cities. The indicator of 3 cities is approximately equal to the GRP of Saint Petersburg, the VPR volume of which was USD 58.9 bln. USD in 2018.

In general, the GRP per capita of 3 Kazakhstan cities of republican subordination exceeds the GRP per capita of Saint Petersburg. The average GRP per capita in the 3 cities is 14,409 USD, while in Saint Petersburg it is 11,021 USD.

Nur-Sultan ranks first among the 3 cities in 5 indicators, such as exports per capita (5,199USD), balance of exports and imports per capita (3,620USD), salaries (627USD), R&D costs per capita (68.8USD) and the number of small businesses per capita (397%) (see Tables 22-22.4, Table A).

Table 22.2

Performance of Kazakhstan's cities of republican subordination in 5 indicators



The city of Almaty is the leader in 3 indicators: GRP per capita (20,381USD), imports per capita (4,446USD), R&D costs per capita (\$46), the ratio of small businesses per capita (3.46%).

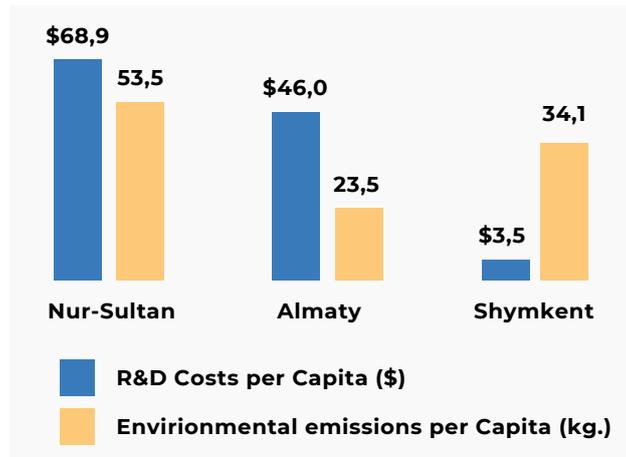
The city of Shymkent is the leader in the following indicators: investments per capita (1,179USD), the ratio of small businesses per capita (1.28%), the balance of migration per capita (3.58%).

It should be noted that Shymkent should improve its trade potential as well as economic indicators. The table demonstrates that Shymkent can improve its rating by improving the GRP, exports and investments indicators. This will allow the new city of republican subordination to move to a higher development level.



Table 22.3

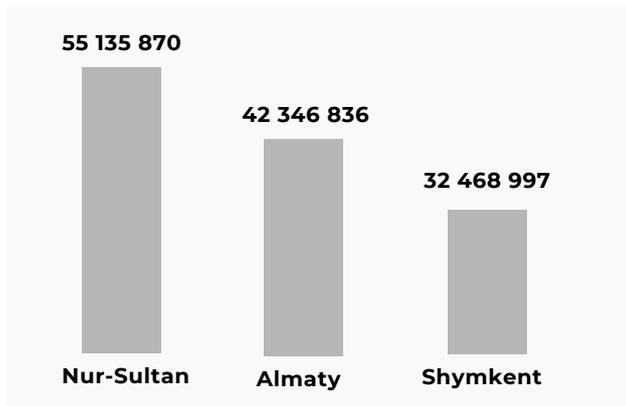
Performance of Kazakhstan's cities of republican subordination in 2 indicators



Tables 22 also show that the city of Nur-Sultan has excellent results in 8 rating indicators and the city of Almaty – in 6 indicators.

Table 22.4

Total environmental emissions in kg



Average R&D costs per capita in 3 cities of republican subordination are 39.4 USD (Table 22.3). This almost 4 times exceeds the average level of 40 cities under review. It should be noted that this is only due to the high ratings of Nur-Sultan and Almaty cities. Performance of Shymkent city is almost 3 times lower than the average level in 40 cities under review.

In addition, we see that the ratio of crimes to the population in the three cities is very high (Table A). We can also see that 3 cities' rating of total environmental emissions and emissions per capita are lower than the average level.

Moreover, the challenge for the cities of Almaty and Shymkent is the low balance of exports and imports per capita.



The GRP volume of Nur-Sultan city amounted to 16.9 bln USD. USD or 6.12% of the GRP volume of 40 CA and the Caucasus cities, or 7.5% of the GRP volume of 34 CA cities.

In general, Nur-Sultan city holds top positions in 11 rating indicators. For instance, Nur-Sultan city ranked the 3rd in the GRP per capita in 2018 with a result of 17,380 USD (Table A).

The city has the highest results in the following indicators: R&D costs per capita in the amount of 68.8 USD per 1 resident (1st place in the rating), and the ratio of small businesses to population, which amounted to 3.97% (1st place in the rating).

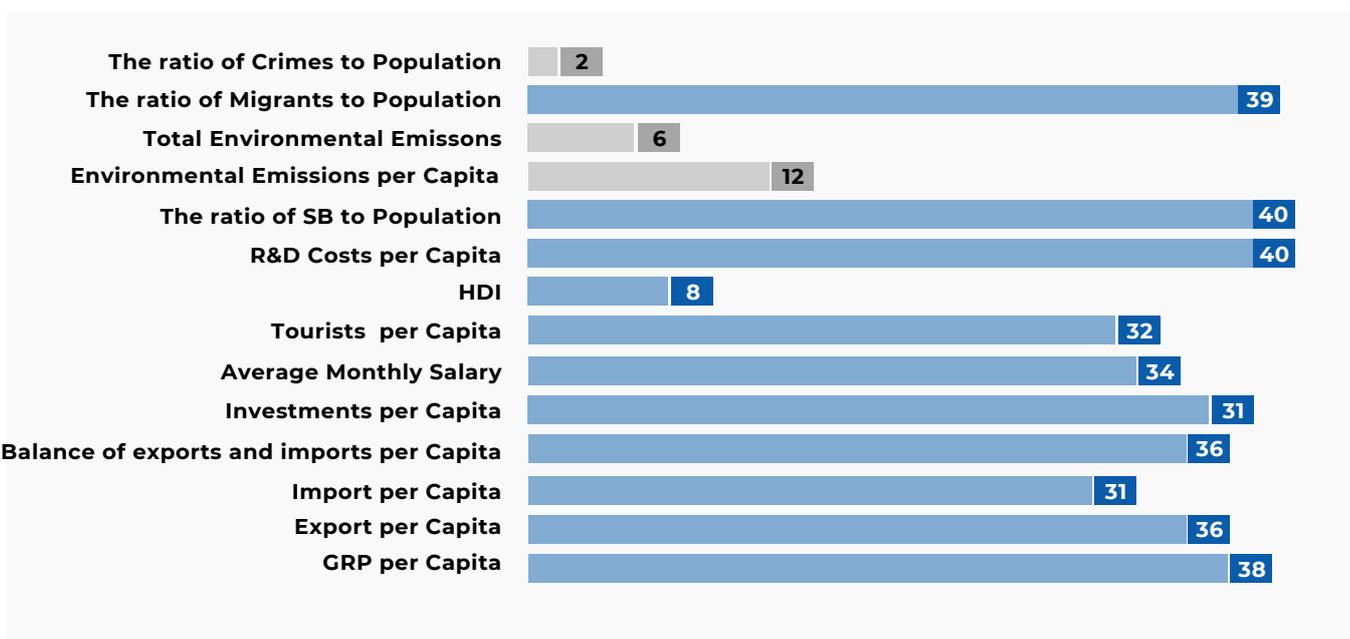
Despite the fact that Nur-Sultan city has the best performance among the 40 CA and the Caucasus cities, they need to be improved when compared to the Baltic cities. For example, R&D per capita in Tallinn for the reporting period amounts to 438 USD, which is 7 times higher than the level of Nur-Sultan city. And the GRP per capita in Tallin in the reporting period was USD 29 224.4, which is 1.7 higher than in Nur-Sultan.

In general, Nur-Sultan city received low scores in 3 indicators. For example, Nur-Sultan city takes nearly the last position in one indicator (Table 23). There is a high ratio of recorded crimes to the population in the city, which is 3.42% (2 points out of 40).

The ratio of crimes to the population indicates the level of the city's safety for its residents. In developed countries, where the balance of migration increases due to the influx of highly qualified specialists, the crime rate often remains unchanged. As for Nur-Sultan city with a high migration balance, the crime rate may increase due to the influx of low-skilled and low-educated workforce from the regions, near and far abroad.

Table 23.

Scores of Nur-Sultan city in 14 CA and Caucasus cities rating indicators



In general, this indicator depends on many factors (social, economic and cultural environment) that require additional improvements and research.

The environmental emissions indicator in Nur-Sultan city is also low. Here, environmental emissions per capita in kg are about 53.5 kg, which is higher than in Almaty (23.5 kg) and Shymkent (34.1 kg). However, this level of environmental emissions in Nur-Sultan city is lower than the average level of environmental emissions in 40 cities, which is 77.9 kg.

The city ranks 35th out of 40 CA and the Caucasus cities in total environmental emissions, with the result of 55.1 thousand tons per year. This indicator is 73% higher than the average level. The indicator of 40 cities is about 31.9 thousand tons per city.

Almaty city outscores Nur-Sultan in the following indicators: GRP per capita and imports per capita. The city received the lowest score (1 of 40) in the ratio of crimes per capita in the 40 cities rating and 1 score out of 40 in the balance of exports and imports per capita (Table 24). These indicators may have been the result of not very efficient use of the city budget and various social, economic and cultural factors.

Table 24 also shows that Almaty holds low positions in environmental emissions per capita (7 points out of 40). Environmental emissions per capita in kg in Almaty city are 23.5 kg. This indicator is almost 3.3 times lower than the average for 40 CA and the Caucasus cities.

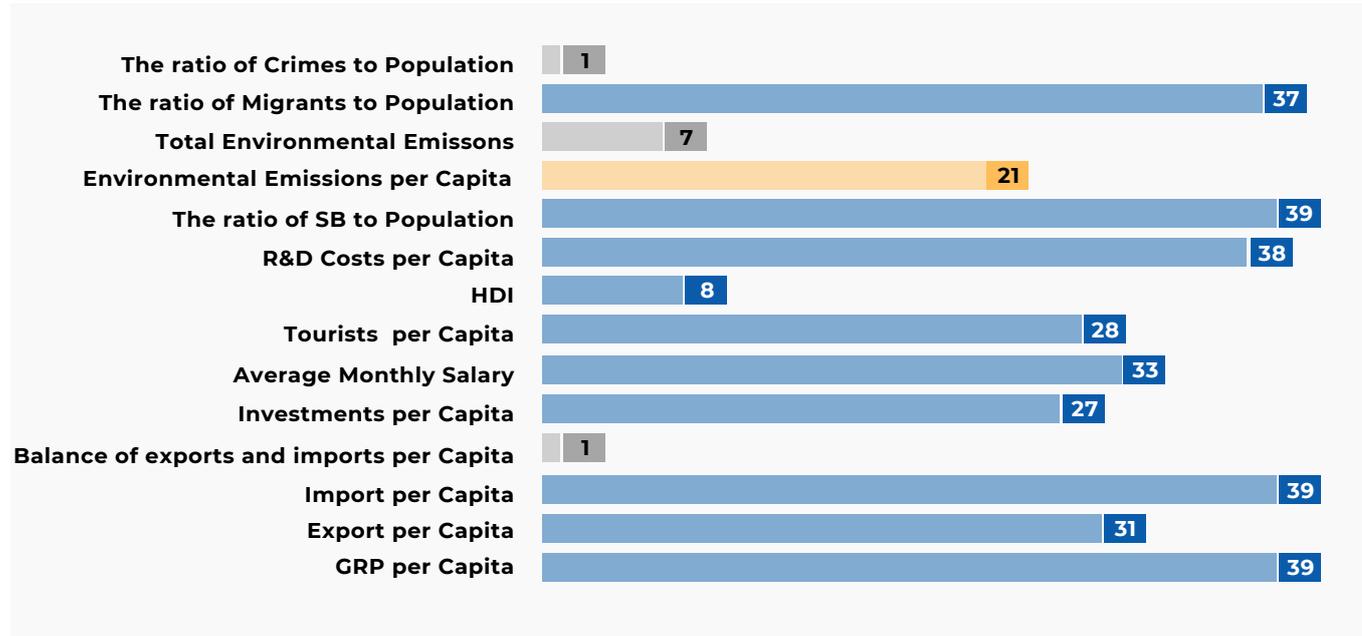


The GRP volume in Almaty city is 36 bln USD or 12.9% of the GRP volume of 40 CA and the Caucasus cities, or 15.8% of the GRP volume in 34 Central Asian cities.

Almaty city ranked 2nd in the GRP per capita in 2018 with the result of 20,381 USD. This indicator was almost equal to the GRP per capita in Moscow, where the result is 19,151 USD in the reporting period.

Table 24.

Scores of Almaty city in 14 indicators of the CA and the Caucasus cities rating



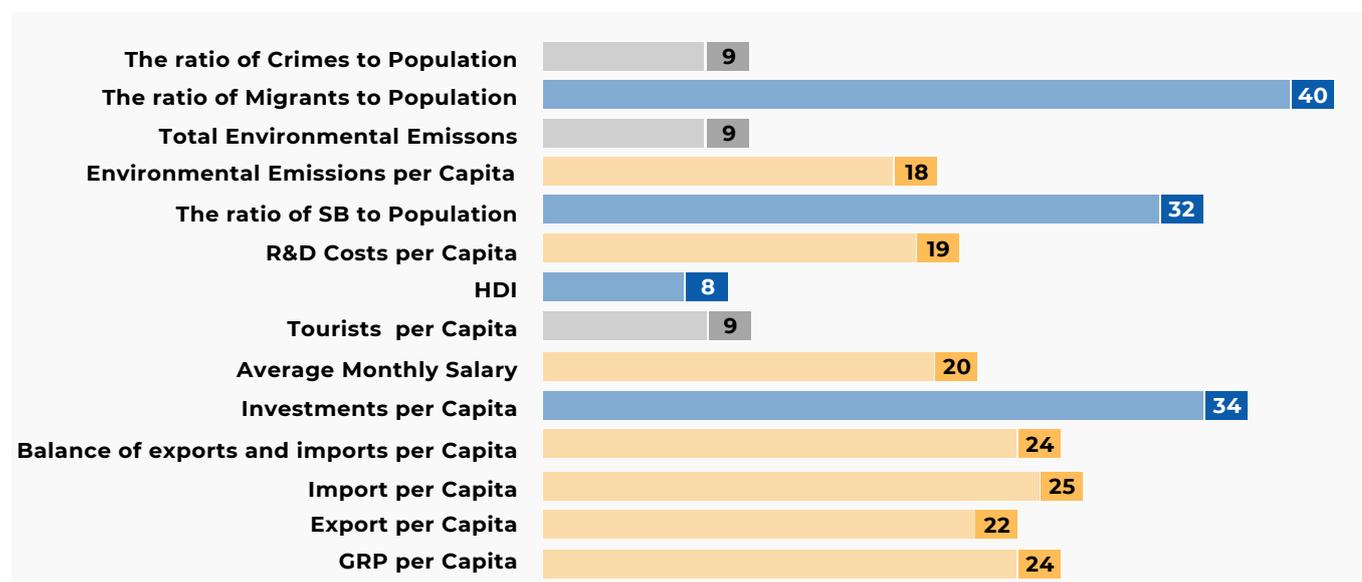
The GRP volume of Shymkent amounted to 5.9 bln USD or 2.1% of the GRP volume of 40 CA and the Caucasus cities and 2.6% of the GRP volume of 34 Central Asian cities.

Shymkent city ranks 17th in the GRP per capita for 2018 with the result of USD 5 465. For comparison, this indicator is almost 4 times lower than in Almaty city and about 3.5 times lower than in Nur-Sultan city.

In general, the third city of republican subordination Shymkent has a range of specific features. Firstly, Shymkent city ranks first by the migration rate with 40 points out of 40 (Table 25). In 2018, Shymkent city became the 3rd city of republican subordination in Kazakhstan. The population inflow from other regions of the country, including from district centers, increased in Shymkent. As a result, this led to an increased migration balance indicator in 2018.

Table 25.

Scores of Shymkent city in 14 rating indicators of the CA and the Caucasus cities



Shymkent received low scores in the following 3 indicators: tourists per capita, environmental emissions in kg, the ratio of crimes to population and balance of exports and imports per capita.

The city has medium results in other rating indicators and has a high potential to improve them. It should be noted that R&D costs per capita, which is 3.4 USD in Shymkent, is also very low (22nd position out of 40) for a large metropolis.

In addition, Shymkent has an opportunity to improve indicators on the number of arriving tourists. Since the city is located at the intersection of 3 main highways leading to the tourism centers of the country and Central Asia: to Turkestan - in the northern direction, to Uzbekistan - in the southern direction, to Taraz and Almaty - in the eastern direction.



The GRP volume of 17 cities of Kazakhstan amounted to about 173 bln USD or 62.7% of the GRP volume of 40 CA and the Caucasus cities, or 76.8% of the GRP volume of 34 Central Asian cities.

According to the main table 1, the rating scores of all Kazakhstan cities can be divided into 3 groups. The first group - high scores (over 280 points). This group includes Nur-Sultan, Atyrau, Aktau, Almaty, Uralsk, Shymkent, Aktobe and Oskemen.

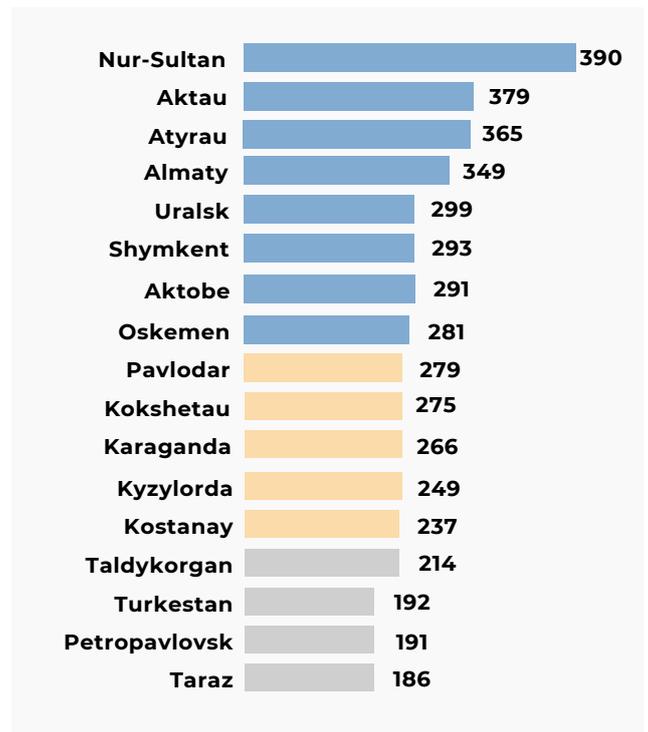
The second group - medium scores (230-280 points). This group includes Pavlodar, Kokshetau, Karaganda, Kyzylorda, and Kostanay.

The third group - low scores (less than 230 points). This group includes Turkestan, Taldykorgan, Taraz, and Petropavlovsk.

According to Table 26, Almaty city underperforms in total rating scores as compared to the cities of Nur-Sultan, Atyrau, and Aktau. And Shymkent city ranked 6th.

Table 26.

Total scores of 17 Kazakhstan cities in 14 indicators



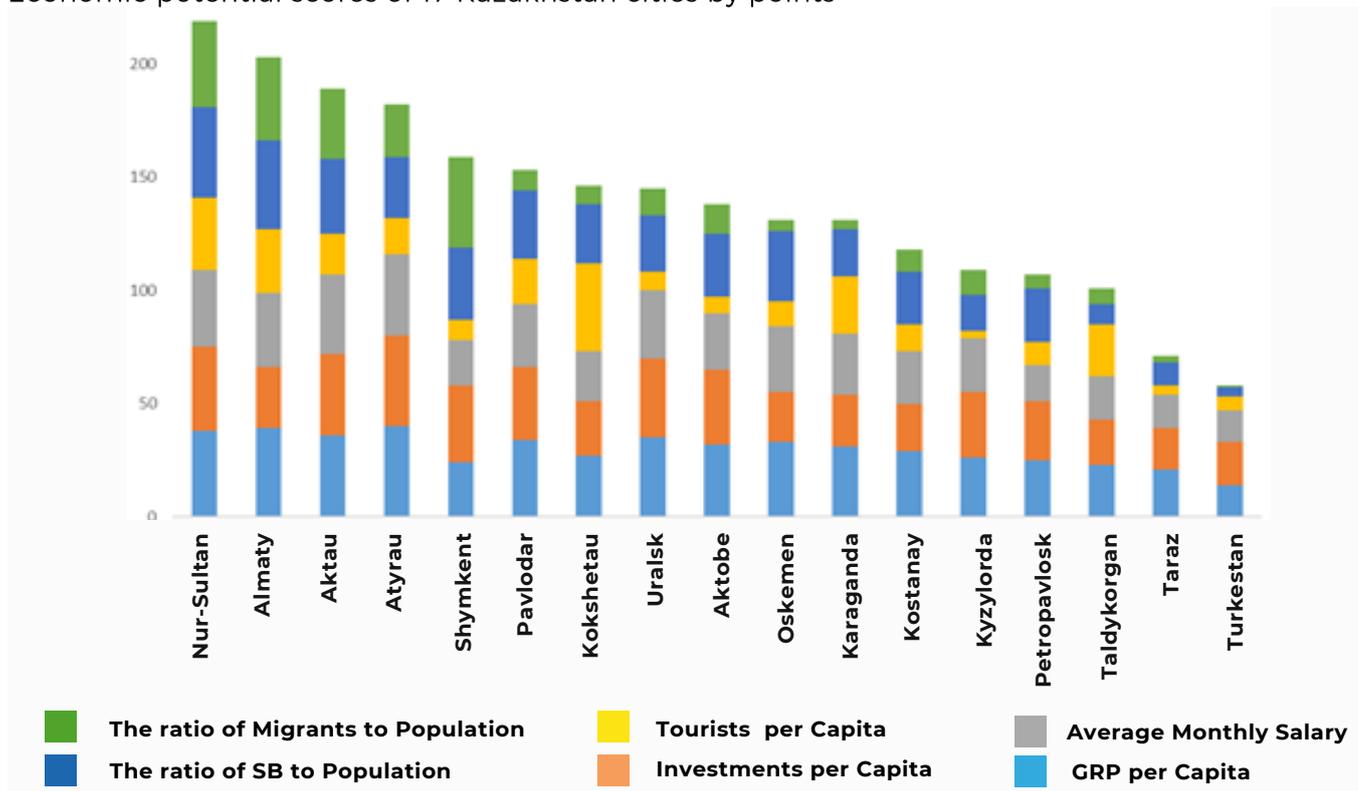
As for economic potential, Almaty city is inferior only to the city of Nur-Sultan, and Shymkent is inferior to 4 cities out of 17 Kazakhstan's cities (Table 27).

Turkestan and Taraz have low economic potential. This is largely due to the fact that Turkestan gained the status of a regional center only in 2018.

Turkestan and Taraz have a tremendous potential for improving their tourism indicators. The unique historical monuments of the Middle Ages are located in the cities and in surrounding areas. In addition, these two cities are located on the Ancient Silk Road, which is of great interest to tourists from Europe and Asia.

Table 27.

Economic potential scores of 17 Kazakhstan cities by points



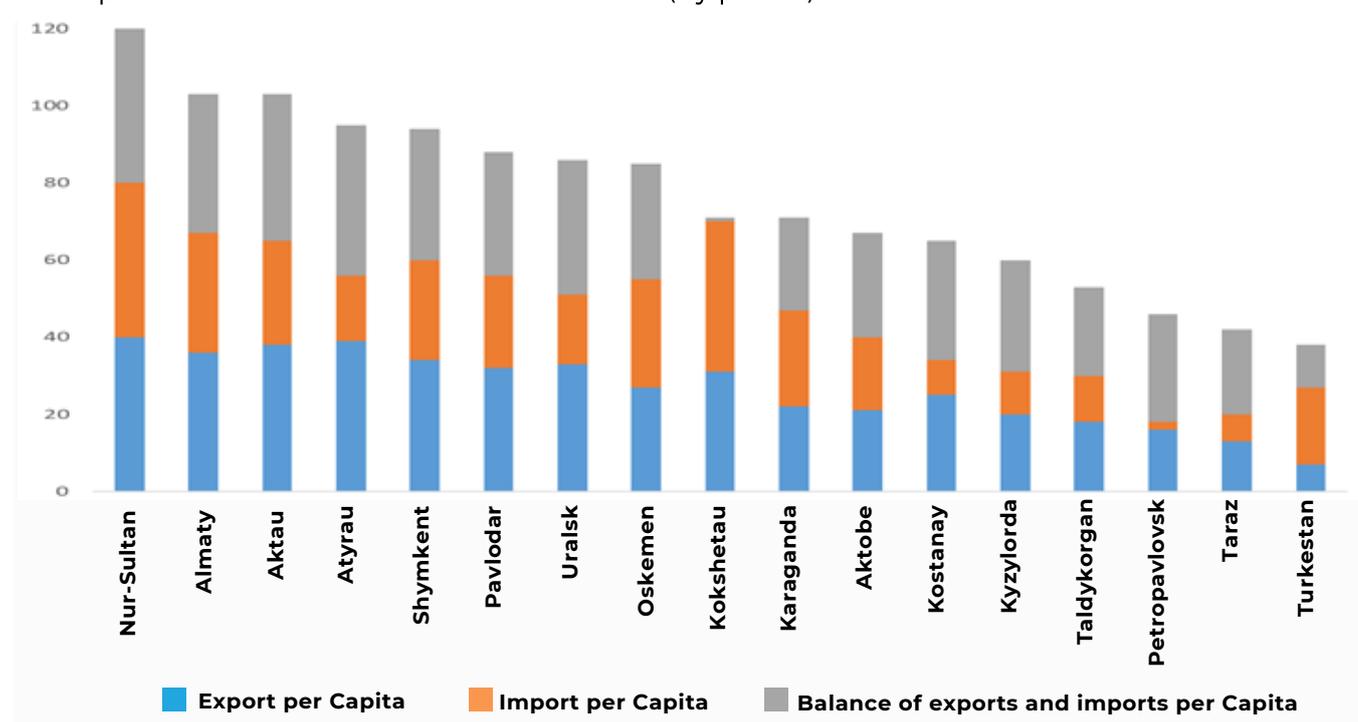
Currently, the number of tourists per capita in Turkestan is 0.137 (35th among 40 cities), and in Taraz - 0,118 (37th among 40 cities). Turkestan's indicator is almost 3.9 times lower than the average indicator for 40 CA and the Caucasus cities, which is equal to 0.543. For Taraz it is more than 4.6 times.

As for the trade potential, Atyrau holds the leading position (Table 28). Nur-Sultan, Aktau, Uralsk, Aktobe, Karaganda, and Pavlodar are also on the top.

Two cities of republican subordination Almaty and Shymkent rank the 9th out of 33 in trade potential.

Table 28.

Trade potential scores of 17 Kazakhstan's cities (by points)



Taldykorgan has the lowest trade potential indicator (26th position out of 33). Despite the fact that the city is near the state border with China, the opportunities for building up trade ties are not fully utilized. In 2018, exports per capita in Taldykorgan amounted to 94.26 USD (34th position out of 40). It is the lowest result among Kazakhstan cities, which is 24 times lower than the average exports per capita (average exports was 2,335 USD).

Despite the fact that Petropavlovsk is near the state border with Russia, Taraz – near the state border with Kyrgyzstan, Shymkent, and Turkestan – near the border with Uzbekistan, the opportunities for building up trade ties are also not fully utilized.

As for the technological development and human capital, the cities of Nur-Sultan, Aktau, Almaty, Atyrau, Aktobe, Oskemen, Kokshetau, Karagana, and Kostanay hold the best positions (Table 29).

Medium positions are held by the cities of Uralsk, Pavlodar, Shymkent, and Taraz.

Kyzylorda, Taldykorgan, Turkestan, and Petropavlovsk have the lowest scores in this area. Petropavlovsk is the last in the list of Kazakhstan cities.

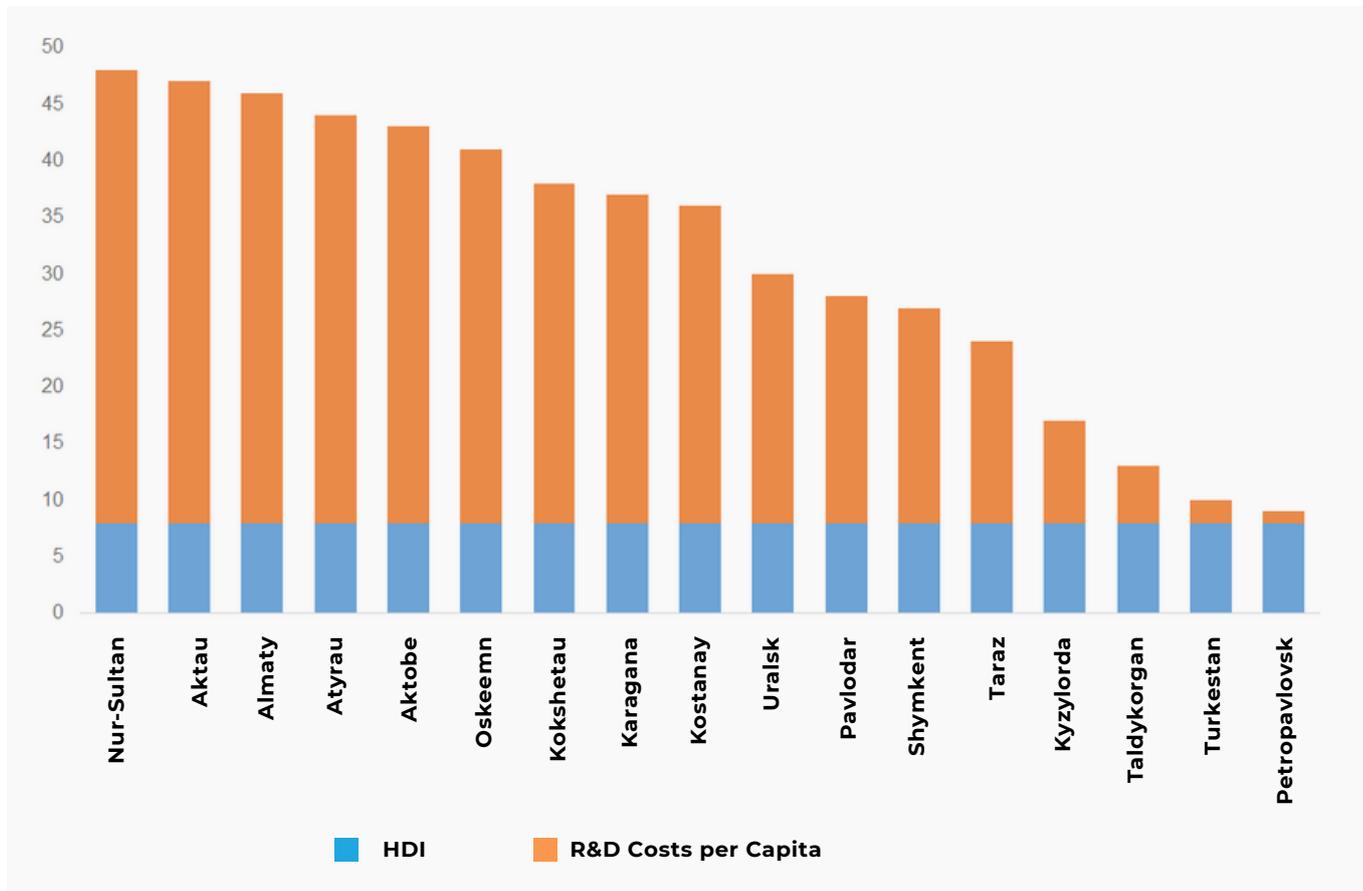
It is worth noting that average R&D costs per capita in 17 cities of the Republic of Kazakhstan amount to 16.09 USD, which is 5.72 USD higher than the average indicator of 40 cities.

In general, total R&D costs in 17 cities amount to about 289.2 mln USD. It is about 93.2% of the total R&D costs in 40 CA and the Caucasus cities.

R&D costs per capita in 3 Kazakhstan's cities (Taldykorgan, Turkestan, and Petropavlovsk) having the worst TDHC rating are at almost the same level of 1.4 USD. These three cities also took the last positions in R&D costs per capita among 40 cities (36-39-40 positions out of 40 cities). In general, the scores of 3 cities are 7 times lower than the average R&D costs per capita in 40 cities.

Table 29.

Technological development and human capital scores of 17 Kazakhstan cities



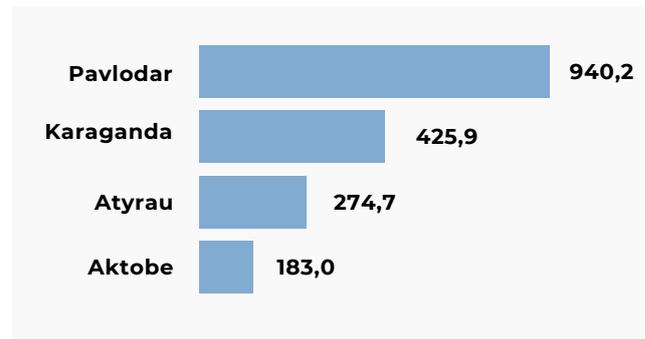
As for environmental emissions, Turkestan, Taldykorgan, Kyzylorda, and Taraz hold the leading positions (Table 30). However, this does not mean that the environmental situation is the most favorable in these cities, since, in addition to environmental emissions, the environmental situation in some cities has worsened due to natural disasters. For example, the drying of the Aral Sea directly affected the ecological situation of the cities of Kyzylorda and Turkestan.

There are many environmental impact sources in Kazakhstan's cities. For example, a cosmodrome, uranium and radioactive elements extraction zone, industrial wastes areas and other facilities significantly worsen the environment in nearby cities.

According to Table 30, Pavlodar, Karaganda, Atyrau, and Aktobe have the highest environmental emissions per capita (Table 30.2). Due to the location of large industrial enterprises in these cities, emissions are the highest in these cities. Moreover, soil and air pollution in some areas exceed generally accepted standards.

Table 30.2

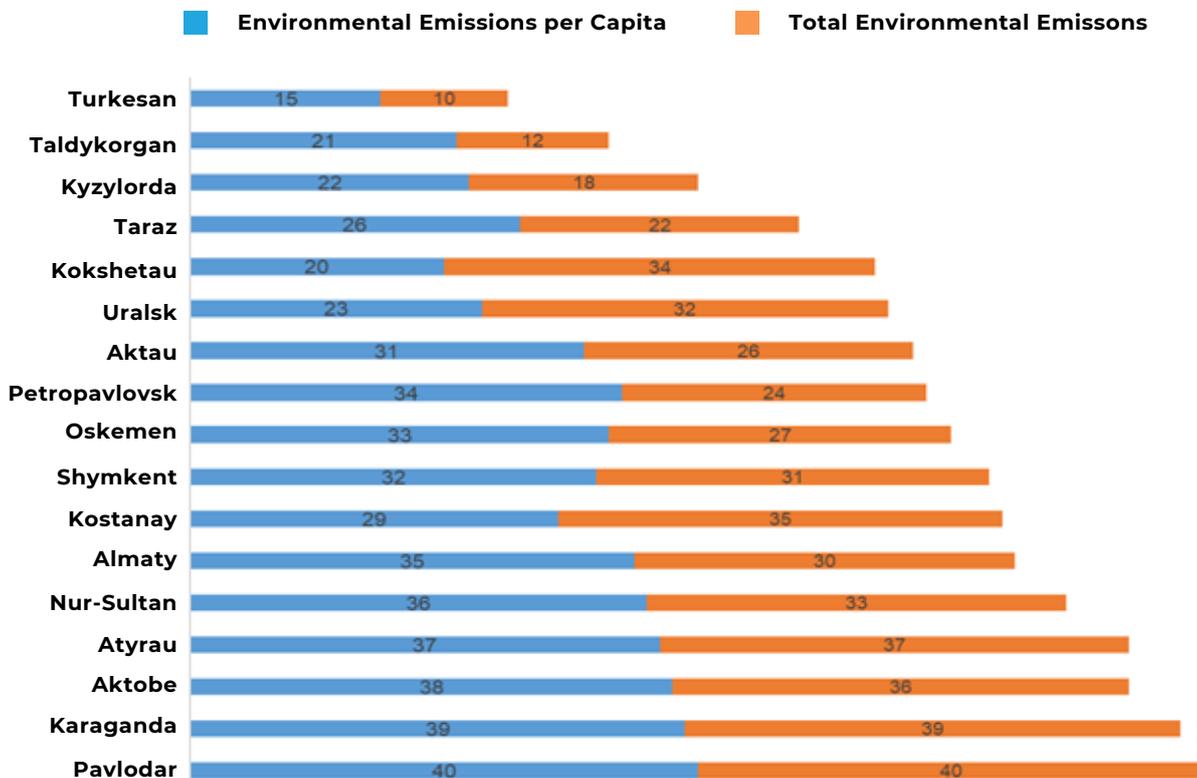
Indicators of 4 cities with the highest environmental emissions per capita, kg



In general, environmental emissions of 17 Kazakhstan cities exceed 976 thousand tons. It is about 77% of the total emissions of 40 CA and Kazakhstan cities. The share of the top 5 Kazakhstan cities with the highest emissions of 702.5 thousand tons per year reaches 56% of the total emissions in 40 cities.

Table 30.

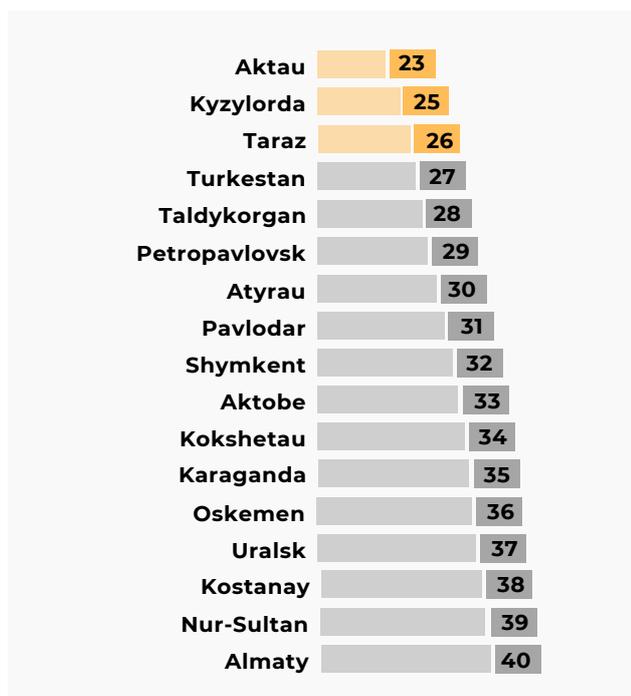
Environmental emissions scores of 17 Kazakhstan cities (by points)



Among 17 cities Aktau has the lowest ratio of crimes per capita (23 points out of 40), which amounts to 0.94%. With an average of 0.88% for 40 cities, other cities in Kazakhstan have even higher rates. For example, Kyzylorda (1.08%), Taraz (1.12%), Turkestan (1.18%), Taldykorgan (1.31%) and Petropavlovsk (1.34%).

Table 31.

Crime rate scores of 17 Kazakhstan cities by points



Among 17 Kazakhstan cities, the highest rate of crimes per capita is in Almaty - 3.64% (40th place). Nur-Sultan (3.42%), Kostanay (2.02%) and Uralsk (1.94%) also have the last rating positions in this area.

In this indicator, the cities of Kazakhstan were not even included in the list of 20 Central Asian and the Caucasus cities.

In general, reducing crime rates in major cities is one of the main challenges for Kazakhstan. More drastic measures are needed to introduce new practices to work with the population, especially with young people.

On the other hand, a high ratio of recorded crimes to the population in the country may be associated with a higher level of transparency of information than in the other countries of the region.

In order to provide a more detailed study and determine the level of safety in the cities, it is necessary to expand the number of indicators and perform a more thorough data assessment.

UZBEKISTAN

12 major cities of Uzbekistan were selected for the 40 CA and the Caucasus cities rating, including the capital city of Tashkent and 11 regional centers.

The population of 12 Uzbekistan cities is about 5.6 mln. people, or about 26.2% of the population of 40 CA and the Caucasus cities, or 34.5% of the population of 34 Central Asian cities.



Tashkent is the largest city in CA and the Caucasus and ranks 9th in the general rating. The city is the leader in the number of tourists per capita with the result of 2.682 tourists per 1 resident. The indicator of tourists per capita in Tashkent is better than that of Riga (2.677 tourists per capita), Vilnius (2.341 tourists per capita), Moscow (1.971 tourists per capita) and other large tourist centers in the region.

In recent years, the economic potential of Tashkent has also been growing due to the greater openness of Uzbekistan and increasing investment attractiveness (30 out of 40).

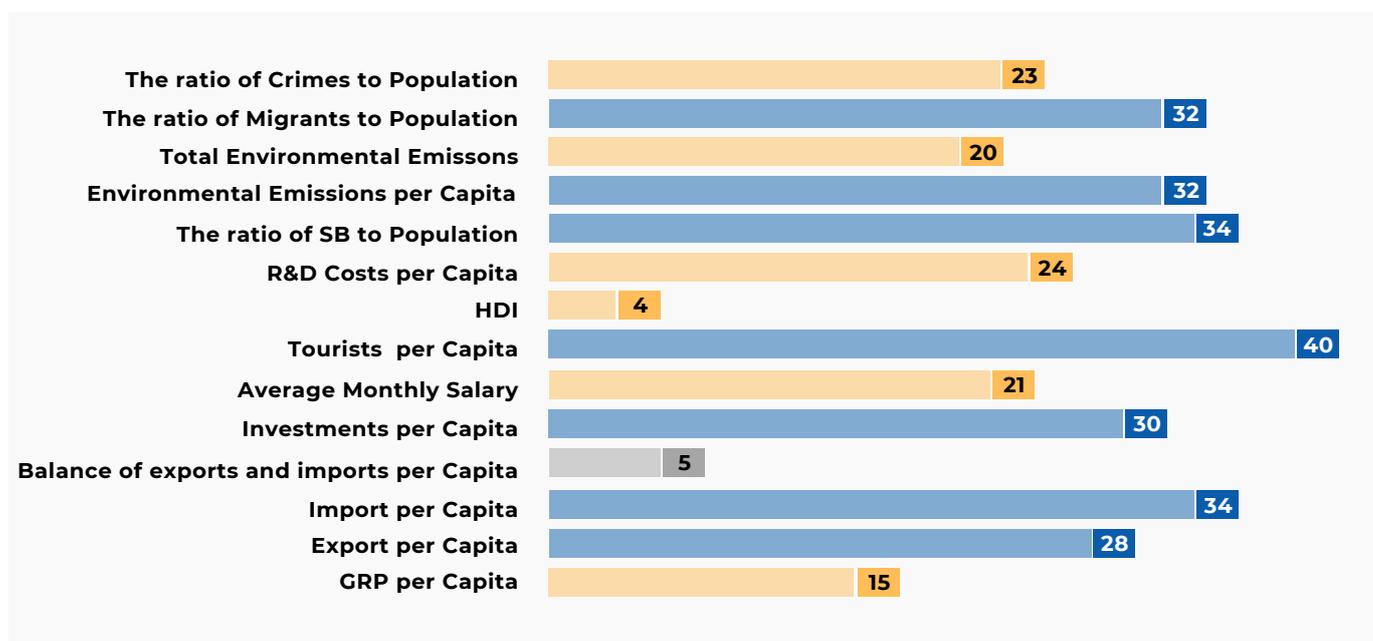
Table 32 shows that Tashkent city holds leading positions in the following indicators: the ratio of small businesses to population - 1.46%, environmental emissions per capita - 6.21 kg, the ratio of migration to population - 0.18% and imports per capita - 2,798USD.

Tashkent city received medium scores in 6 positions. Within this, R&D costs per capita in Tashkent are 4.9USD, which is higher than in Shymkent (3.4USD), Bishkek (3.1USD), and Dushanbe (2.4USD).

Tashkent has the lowest performance in the balance of exports and imports (-2,115USD).

Table 32.

Scores of Tashkent city in 14 indicators



In general, the main challenge for the city today is to build the economic potential through the development of competitive and export-oriented goods and services.



According to the total rating scores, Uzbekistan cities may be divided into 3 groups.

The first group with high scores (over 300 points) includes Tashkent city only.

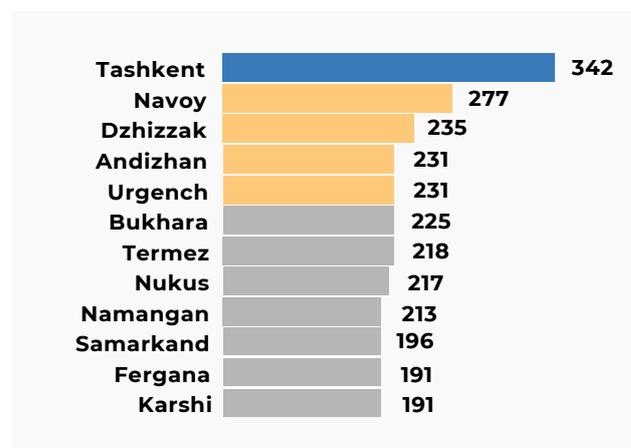
The second group includes the cities with medium scores (230-300 points). This group includes Navoi, Jizzakh, Andijan, and Urgench.

The third group includes the cities with low scores (less than 230 points). This group includes Termez, Namangan, Bukhara, Fergana, Samarkand, Nukus, and Karshi.

The majority of Uzbekistan's cities are at the level of 200-250 points with Karshi city having the lowest indicator of 190 points (Table 33).

Table 33.

Total scores of 12 Uzbekistan cities in 14 indicators



The GRP volume of 12 Uzbekistan cities is 33.4 bln USD or 12.1% of the GRP volume of 40 CA and the Caucasus cities. For reference, the GRP volume of 12 Uzbekistan's cities is less than the GRP of Almaty (35.6 bln USD) and Baku (37.2 bln USD).

It should be noted that all regional cities of Uzbekistan are at equal development level, which evidences that not all of them use their competitive advantages at the same level as Kazakhstan cities.

For instance, Namangan city received 213 points. This city has the lowest GRP per capita, which is only 808.5 USD. And the average indicator of 40 CA and the Caucasus cities is 6,155.5 USD.

Uzbekistan cities have also low R&D costs per capita. For example, the average indicator of 12 cities is 2.48 USD per 1 person. While the average indicator for 40 cities is 10.37 USD.

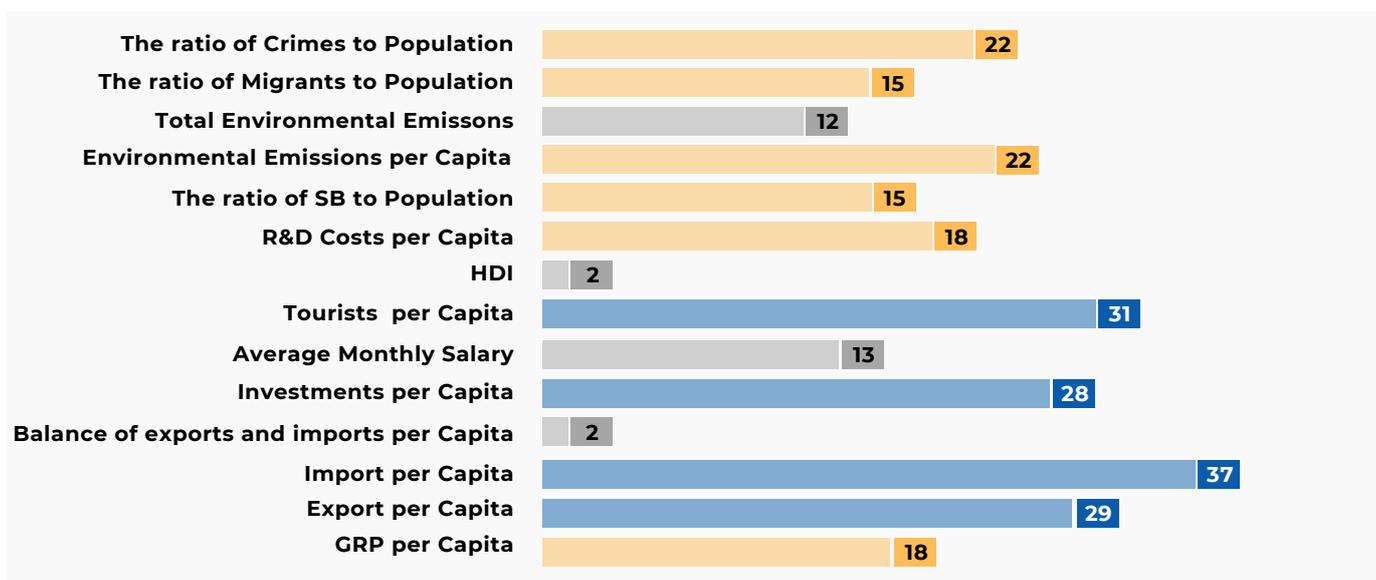
Generally, R&D costs of 12 Uzbekistan cities amount to about 6.4 mln USD. It is about 2.0% of the total R&D costs in 40 CA and the Caucasus cities.

As for environmental emissions, total emissions of 12 Uzbekistan cities amount to about 69.8 thousand tons per year, and it is only 5.5% of the total emissions of all 40 CA and the Caucasus cities.

The average environmental emissions in kg per capita in 12 Uzbekistan cities are 18.24 kg. It is almost 4.3 times lower than the average environmental emissions for 40 cities, which are 77.8 kg

One of the best scores of Uzbekistan cities is the ratio of crimes per capita. The average for 12 cities is 0.15%. It is almost 6 times lower than the average for 40 CA and the Caucasus cities.

Table 34.
Scores of Bishkek city in 14 indicators



KYRGYZSTAN

40 CA and the Caucasus cities rating included 2 major cities of Kyrgyzstan – Bishkek, and Osh.

The population of 2 Kyrgyzstan cities amounts to about 1.29 mln people, which is about 6% of the population in 40 CA and the Caucasus cities, or 7.9% of the population in 34 Central Asian cities.

The GRP volume of 2 Kyrgyzstan cities amounted to 3.4 bln USD or 1.22% of the GRP volume of 40 CA and the Caucasus cities. This indicator slightly exceeds the GRP of Petropavlovsk, which was 3.35 bln USD in 2018.

In general, the largest Kyrgyzstan city Bishkek received a general score of 264 and ranked 20th in the 40 Central Asian and the Caucasus cities rating.

Despite the fact that the population of Bishkek is almost equal to the population of Nur-Sultan, Shymkent, Ashgabat or Yerevan, the city is many times inferior to them in various economic indicators.

For reference, the population of Bishkek is almost equal to the population of Shymkent, however, the GRP of this city 2 times exceeds the indicator of Bishkek city. Thus, the GRP of Shymkent is 5.9 bln USD and the GRP of Bishkek - 2.9 bln USD

For example, the GRP per capita of Nur-Sultan city is almost 6 times greater than the GRP per capita of Bishkek.

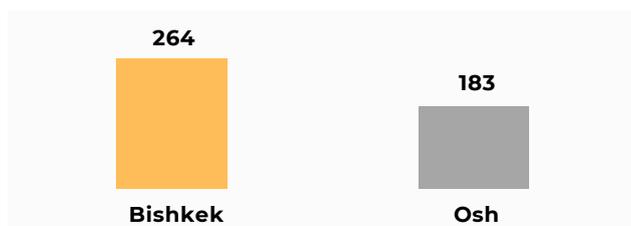
Table 34 shows that Bishkek city received high scores in the following indicators: imports per capita - 3,693USD, exports per capita, investments per capita - 1,198USD and tourists per capita - 0.726. Bishkek has the lowest scores in the balance of exports and imports per capita (-2,397USD) and HDI - 0.672 (2 out of 8). Bishkek received low scores in average salary (298USD) and total environmental emissions in kg (21.8 thousand tons).

In comparison with the second largest city, the total score of Bishkek city is 1.5 times higher than the score of Osh (Table 35).

In general, 2 of Kyrgyzstan's cities have medium and low scores. As for R&D costs per capita, the indicators of 2 cities are almost 4 times lower than the average of 40 cities and amount to 2.5 USD per 1 person.

Table 35.

Scores of Bishkek and Osh.



R&D costs of 2 Kyrgyzstan's cities do not exceed 0.1% of R&D costs of 40 CA and the Caucasus cities (372 thousand USD). All this indicates poor economic sector development, and most importantly, poor human resources development, which require new financing approaches in the context of global economic competition.

It should be noted that one of the largest Kyrgyzstan cities, the city of Osh, holds the lowest position in the overall rating of 40 cities - the 40th place with a total score of 183 points.

Osh received high scores only in two environmental emissions indicators: environmental emissions in kg per capita - 6.55 kg and total environmental emissions - 1.8 thousand tons.

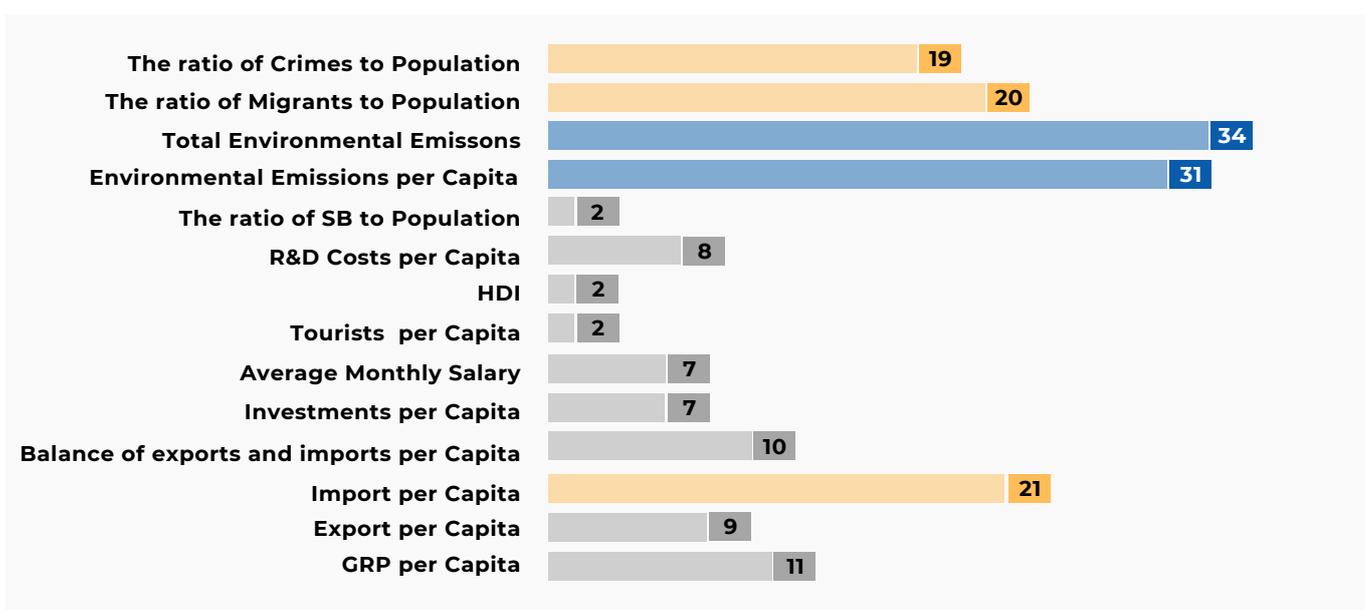
On average, the city of Osh received medium scores in 3 indicators and low scores in 9 rating indicators (Table 36).

According to table 36, Osh city received the lowest scores in the number of tourists per capita (0.111) and the ratio of migration to population (0.27%).

It is noteworthy that the total emissions of 2 Kyrgyzstan's cities are 23.7 thousand tons per year, representing 1.87% of the total emissions of 40 cities.

Table 36.

Scores of Osh in 14 indicators



As for the number of crimes to population, the average score of the two cities is 0.58%. It is lower than the average for 40 cities (0.88%), as well as for 17 cities of Kazakhstan (1.71%). Generally, this characterizes the competitive advantage to develop the tourism potential of Kyrgyzstan cities.

TAJIKISTAN

The 40 CA and the Caucasus cities rating included 2 major cities of Tajikistan – the capital Dushanbe and the city of Khujand.

The population of 2 Tajikistan’s cities is about 994 thousand people, which is about 4.7% of the population of 40 CA and the Caucasus cities or 6.1% of the population of 34 Central Asian cities.

The GRP volume of 2 Tajikistan’s cities amounted to 9.6 blnUSD or 3.5% of the GRP volume of 40 CA and the Caucasus cities. Dushanbe ranks the 34th in the GRP volume with a result of 1.6 bln USD – the lowest performance among the capitals of the CA and the Caucasus countries. And the city of Khujand ranks 9th with 8 bln USD, which is one of the highest results in the region.

At the same time, Tajikistan cities have several advantages over several cities of Uzbekistan. For example, the GRP per capita in Khujand is 3,139 USD (21st place), and in Dushanbe –1,995 USD (28th place).

Dushanbe received 267 points in the general rating of cities' competitiveness and ranked 18th in the rating of 40 CA and the Caucasus cities.

According to Table 37, Dushanbe received high ratings in the number of tourists per capita – 1.415 tourists per capita (3rd position out of 40), the ratio of small businesses to population – 1.20% (12th position), the ratio of migration balance to population - 0.26% (8th position) and environmental emissions in kg per capita – 8.58 kg (11th position) (see Table A).

Dushanbe received medium scores in 4 rating indicators: balance of exports and imports per capita (-177USD), R&D costs per capita (2.4USD), total environmental emissions (7 thousand tons) and the ratio of crimes to population (0.57%).

Dushanbe received lower results in the following 6 rating indicators: GRP per capita (1,995USD), exports per capita (134USD), imports per capita (312USD), investments per capita (433USD), salaries (210USD) and HDI - 0.650 (1 out of 8). It is worth noting that Tajikistan cities have the lowest HDI results among all Central Asian and the Caucasus cities, that is why Dushanbe and Khujand received low ratings by total score, especially in technological development and human capital.

Table 37.

Scores of Dushanbe in 14 indicators

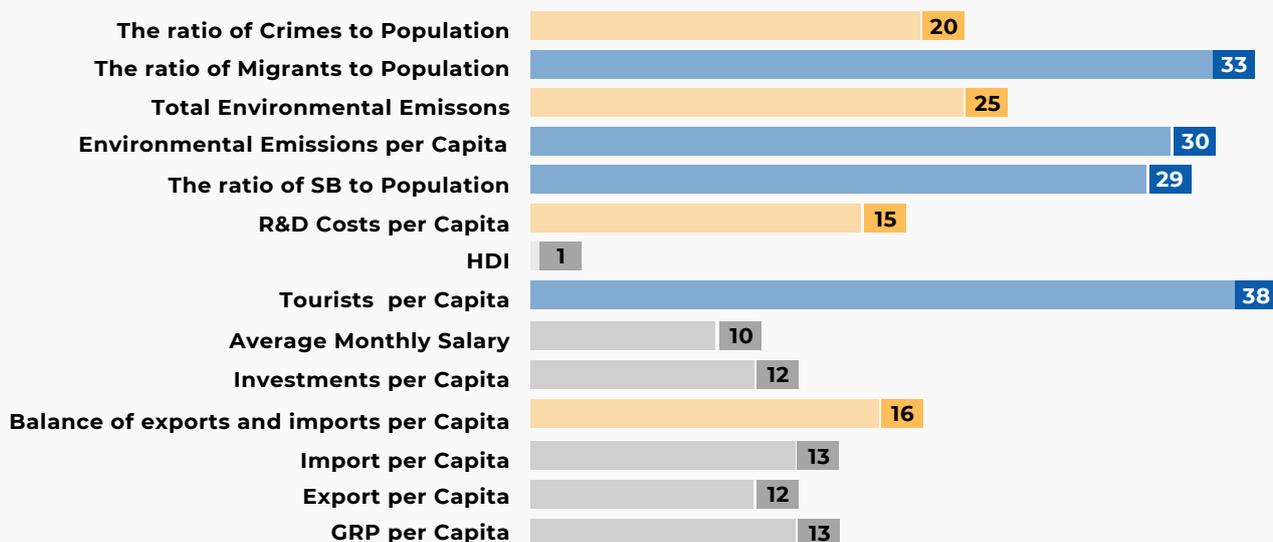
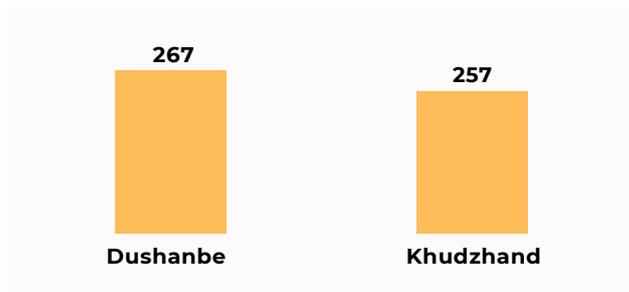


Table 38.

Scores of Dushanbe and Khujand



Generally, two of Tajikistan cities received almost equal scores. The position of the second major city of Tajikistan, the city of Khujand, in the rating is just 10 points lower than the position of Dushanbe (Table 38).

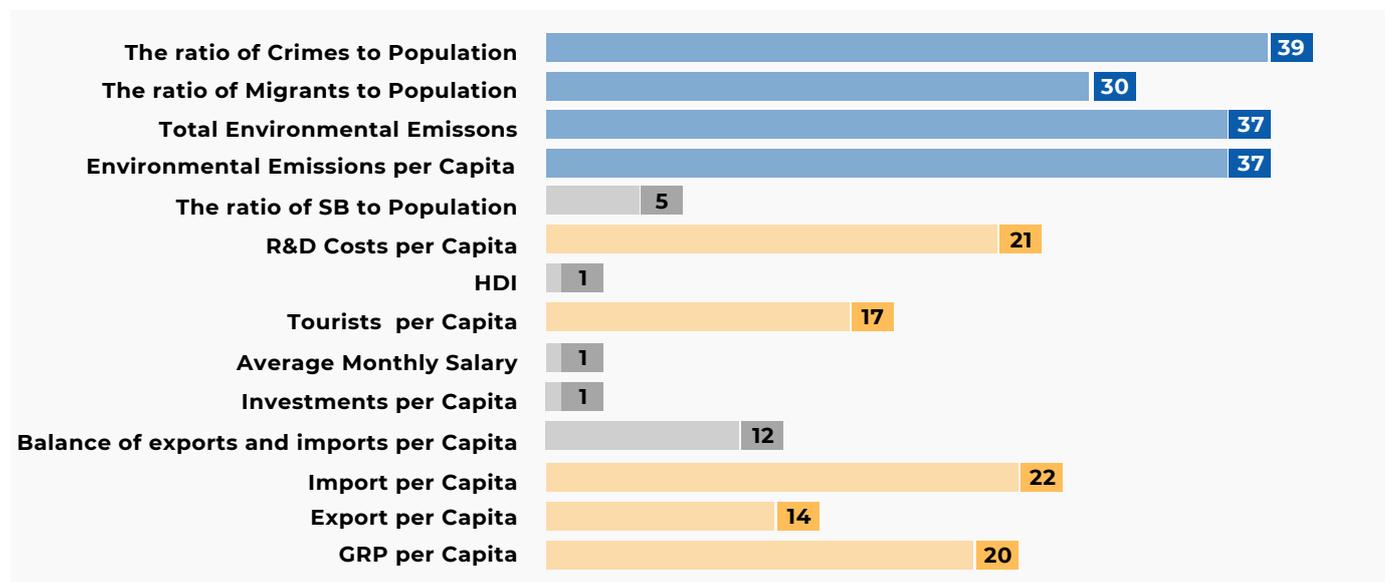
This means that Khujand has a number of competitive advantages, not only in Tajikistan but also among 40 CA and the Caucasus cities.

The city of Khujand has the highest rating in 4 indicators: in 2 environmental emissions indicators - 3.37 kg of environmental emissions per capita (4th place) and 600 tons of total environmental emissions (4th place), the ratio of migration to population - 0.11% (11th place) and the ratio of crimes to population - 0.05% (Table 39).

Khujand has medium results in the GRP per capita (3,139USD), imports per capita (568USD) and R&D costs per capita (3.8USD).

Table 39.

Scores of Khujand in 14 indicators



Generally, the city received medium results in 5 rating indicators, and low results - in 5 indicators.

In addition to HDI, Khujand also holds the last positions in investments per capita - 152USD (40th place) and average salaries - 118.5USD (40th place).

The low scores of Tajikistan cities are reasoned by many factors. One important factor is education and science. For example, Tajikistan cities have low R&D costs per capita. Thus, the average value for 2 cities is 3 USD per 1 person. While the average value for 40 cities is 10.3 USD.

Generally, R&D costs of 2 Tajikistan's cities are about 1.2 mln USD. This is 0.37% of the total R&D costs in 40 CA and the Caucasus cities.

Despite the low positions in economic and social indicators, the cities of Tajikistan have a certain advantage in terms of environmental cleanliness and crime rate.

For example, the total emissions of 2 cities in Tajikistan are only 7.6 thousand tons per year or 0.6% of the total emissions of 40 CA and the Caucasus cities.

Average environmental emissions in kg per capita in 2 cities are 5.7 kg, which is 13 times lower than the average volume for 40 cities and is equal to the level of Moscow.

As for the ratio of crimes to the population, the average score of the two cities is 0.31%. This is lower than in 40 CA and the Caucasus cities (0.88%), as well as in 17 cities of Kazakhstan (1.71%), Armenia (0.96%), Kyrgyzstan (0.58%) and Azerbaijan (0.38%).

TURKMENISTAN

The 40 CA and the Caucasus cities rating includes the largest city of the country – the capital Ashgabat.

According to the UN data, the population of Ashgabat amounts to about 811 thousand people, which is about 3.8% of the population of 40 CA and the Caucasus cities or 4.9% of the population of 34 Central Asian cities.

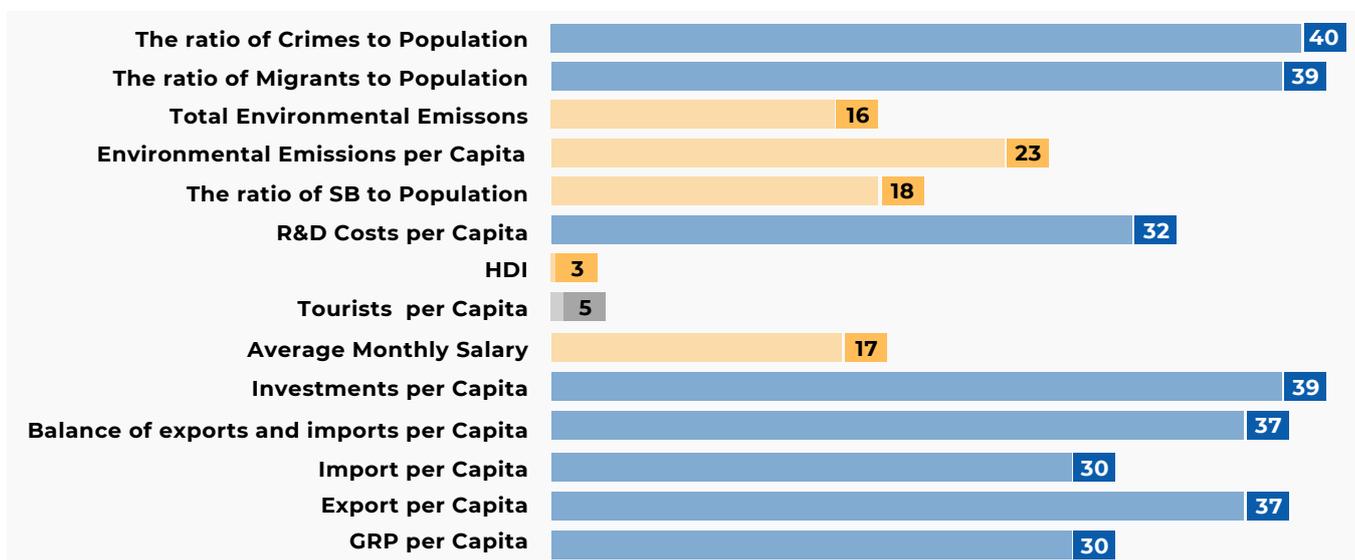
The GRP volume of Ashgabat amounted to 5.5 bln USD (17th place) or 2% of the GRP volume of 40 CA and the Caucasus cities. However, Ashgabat ranks 11th in the GRP per capita with the result of 6,848 USD. It is approximately equal to the GRP per capita of Oskemen (7,170 USD).

Generally, Ashgabat ranked 5th in the rating with a total score of 366 and entered the top ten most competitive cities in Central Asia and the Caucasus.

Table 40 demonstrates that the city holds the highest positions in investments per capita - 4,173USD (2nd place out of 40 cities), R&D costs per capita - 13.7USD (9th place) he ratio of migration to population - 2.39% (2nd place)

Table 40.

Scores of Ashgabat in 14 indicators



tand has the lowest crime rate in the Central Asia and the Caucasus - 0.01% (1st place).

It should be noted that Ashgabat has the highest R&D costs per capita as compared to 40 reviewed cities. Thus, the indicator of Ashgabat is 13.69 USD per 1 person.

Generally, the R&D costs of Ashgabat are about 1.1 mln USD and about 0.36% of the total R&D costs in 40 CA and the Caucasus cities.

As for the ratio of crimes to the population, the indicator of Ashgabat is 0.01%. It is the best result for 40 cities.

At the same time, Ashgabat holds medium positions in 5 indicators: average salary - 330USD (20th place out of 40), HDI - 0.706 (3rd out of 8), the ratio of small businesses to population - 0.71 (23rd place), environmental emissions in kg per capita - 21.6 kg (18th place) and total environmental emissions in kg - 17.5 thous. tons (25th place) (see Table A).

Total emissions of Ashgabat with an indicator of 17.5 thous. tons per year represent only 1.38% of the total emissions of all 40 CA and the Caucasus cities.

Ashgabat's environmental emissions in kg per capita (21.6 kg) are almost 3.6 times lower than the average value for 40 cities.

The city has the lowest results in the number of tourists per capita - 0.130 (36th place).

It is worth noting that access to the official statistics of Turkmenistan on the Internet is very limited. Therefore, the calculations were made on the basis of data provided on official websites.

THE CAUCASUS CITIES

The competitiveness rating of the 40 cities of CA and the Caucasus included 7 cities of 3 Caucasus countries. 3 major cities of Georgia, 2 major cities of Azerbaijan and the capital of Armenia.

The population of 6 Caucasus cities is about 5 mln people, which is 23.9% of the population of 40 CA and the Caucasus cities.

The GRP volume of 6 Caucasus cities is 50.9 billion USD or 18.5% of the GRP volume of 40 CA and the Caucasus cities.

AZERBAIJAN

The GRP volume of 2 Azerbaijan's cities is 37.6 bln USD, or 13.6% of the GRP volume of 40 CA and the Caucasus cities.

The population of 2 Azerbaijan's cities is slightly more than 2.6 mln people, which is 11.2% of the population of 40 CA and the Caucasus cities or 50.8% of the population of 6 Caucasus cities.

Baku ranks 2nd in the 40 CA and the Caucasus cities rating with the total score of 384 and enters the top five cities in the general competitiveness rating.

For example, the city 6.3 times outscores Tashkent (2,602 USD) in GRP per capita (16,355 USD). Generally, the indicators of Baku in the GRP per capita outscore the capitals of the Caucasus and Central Asian cities, except for Nur-Sultan city.

For example, Baku 2.5 times outscores Tbilisi with the value of 6,556 USD, and 5.7 times outscores Yerevan with the value of 2,841 USD.

According to Table 41, Baku is the leader in 10 rating indicators with high scores.

Generally, Baku received the highest scores in 4 indicators: GRP per capita – 16,355USD (4th place), investments per capita – 3,085USD (3rd place), R&D costs per capita – 36USD (4th place) and the ratio of small businesses to population – 2.77% (3rd place) (see Table A).

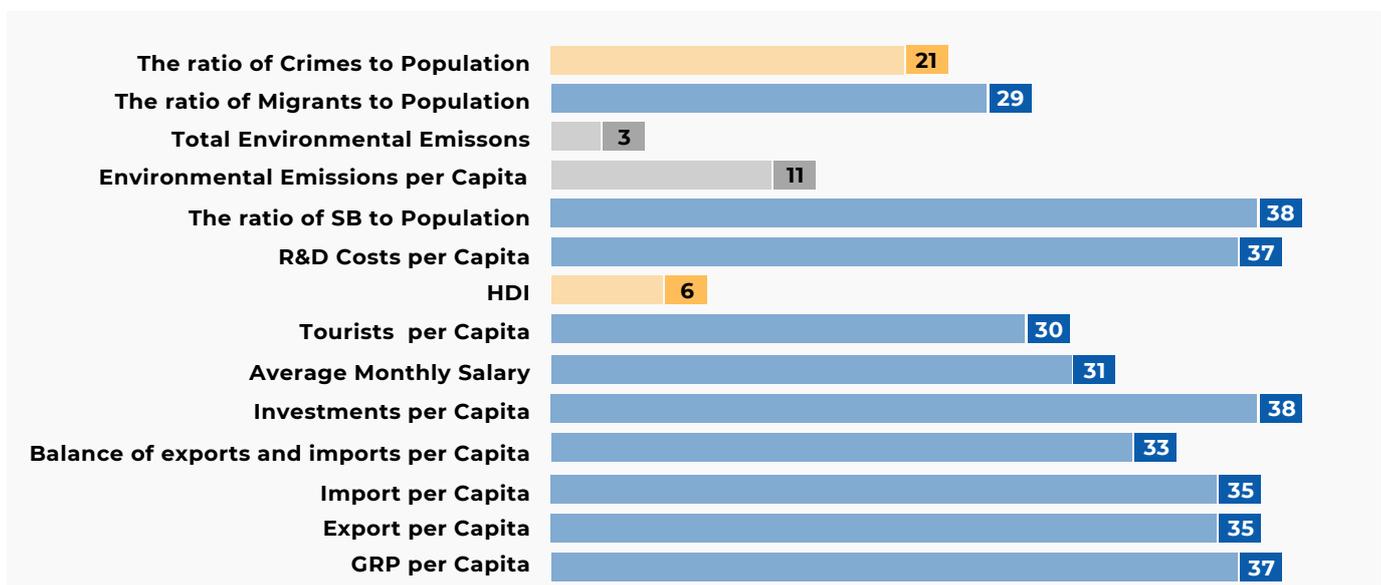
Baku reached relatively high positions in the following indicators: exports per capita – 4,824USD (6th place), imports per capita – 2,842USD (6th place), balance of exports and imports per capita – 1,981USD (8th place), average salaries – 462USD (6 place), tourists per capita – 0.698 (11th place) and the ratio of migration to population – 0.07% (12th place).

The city holds medium positions in the following indicators: HDI – 0.757 (6 out of 8) and the ratio of crimes to population – 0.54% (20th position).

Baku holds low positions (11th out of 40) in environmental emissions per capita – 60.55 kg (30th place) and in the total emissions – 137 thousand tons (38th place).

Table 41.

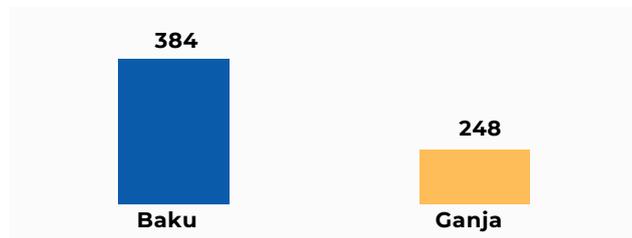
Scores of Baku in 14 indicators



The second major city of Azerbaijan - Ganja ranked 24th among the 40 Central Asian and the Caucasus cities with 248 points (Table 42).

Table 42.

Total scores of Baku and Ganja in 14 rating indicators



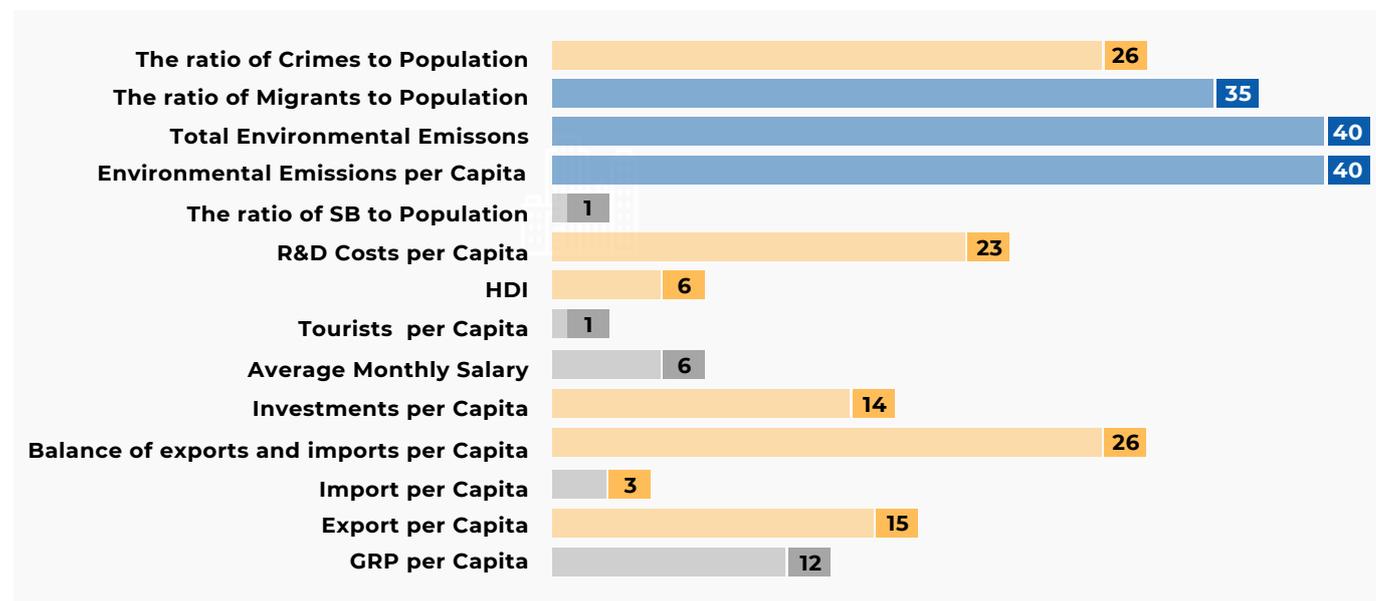
The estimation of Ganja city in 14 indicators demonstrates that the city holds positive positions in 3 indicators: environmental emissions per capita - 0.6 kg (1st place), total environmental emissions in kg - 200 tons (1st place) and the ratio of migration to population - 0.36% (6th place) (Table 43).

Ganja city has medium scores in 6 indicators: exports per capita - 234USD (26th place), balance of exports and imports per capita - 96USD (15th place), investments per capita - 565USD (27th place), HDI - 0.757 (6th out of 8), R&D costs per capita - 4USD (18th place), the ratio of crimes to population - 0.22 (15th place).

The city has low scores in 5 indicators - GRP per capita (1,829USD), imports per capita (1,38USD), salaries (198.7USD), tourists per capita (0.040) and the ratio of small businesses to population (0.01%).

Table 43.

Scores of Ganja city in 14 positions



Ganja city holds the last position in the overall rating of 40 Central Asian and the Caucasus cities in the ratio of small businesses to population.

It should be noted that the aggregate result of 2 cities in R&D costs per capita is 20 USD per 1 person. While the average result for 40 cities is 10.3 USD.

Generally, the R&D costs of 2 cities are about 8.3 mln. on average. It is about 2.7% of the total R&D costs in 40 CA and the Caucasus cities.

Two cities of Azerbaijan have 137.2 thousand tons of emissions per year. It is 10.7% of the total emissions of all 40 CA and the Caucasus cities. The share of Baku among 2 cities is 99.8%.

The average value of 2 cities in environmental emissions is 30.58 kg, which is 2.5 lower than the average value of 40 cities.

An important factor for tourism development is the low crime rate. As of the ratio of crimes to the population, the average result of the two cities of Azerbaijan is also very attractive - 0.38%. This indicator is lower than in 40 CA and the Caucasus cities (0.88%), in 17 cities of Kazakhstan (1.71%), Armenia (0.96%) and Kyrgyzstan (0.58%).

АРМЕНИЯ



Yerevan city ranked 15th among the 40 cities with 279 points. The GRP volume of the city is 3.1 bln USD or 1.1% of the GRP volume of 40 CA and the Caucasus cities.

The population of Yerevan (1.1 mln.) represents about 5% of the population of 40 CA and the Caucasus cities or 21.1% of the population of the 6 Caucasus cities.

Generally, the GRP of Yerevan is equal to the GRP of Fergana city and slightly more than the GRP of Bishkek. The population of Yerevan exceeds the population of such cities as Ashgabat, Nur-Sultan, Bishkek, and Dushanbe (according to 2018 data).

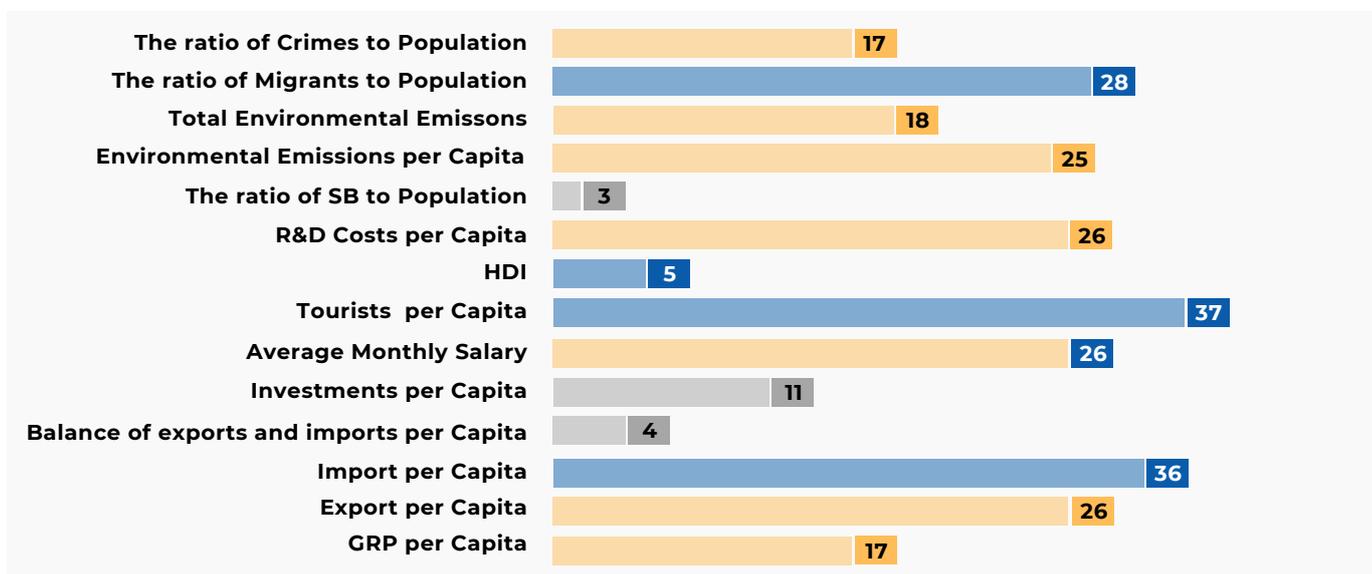
Table 44 shows that Yerevan city holds the leading positions in imports per capita (3,033USD), tourists per capita (1.392), average salaries (402USD) and migration balance to population (0.06%).

Yerevan holds the medium positions in such indicators as GRP per capita (2,841USD), exports per capita (918USD), HDI (0.755), total environmental emissions (17 thousand tons) and crimes to population (0.96%).

For example, Yerevan ranks 14th in R&D costs per capita with an indicator of 6.5 USD. Generally, R&D costs of the city amounted to about 705 thousand USD or 0.23% of the total R&D costs in 40 CA and the Caucasus cities.

Table 44.

Scores of Yerevan in 14 indicators



The city has a low balance of exports and imports per capita (-2,115USD), investments per capita (396USD), and the ratio of small businesses to population (0.28%).

A competitive advantage to maintain the level of health and comfort in the cities is the level of pollution. Yerevan has a more favorable picture of this issue.

As for the total environmental emissions, the city ranks 18th with the volume of 16.9 thousand tons per year. It is only 1.33% of emissions of 40 CA and the Caucasus cities.

The average environmental emissions in kg per capita in Yerevan are 15.7 kg, which is 5 times lower than the average volume for 40 cities and is equal to the level of the capitals of the Baltic states.

As for the ratio of crimes to the population, the average indicator of the city is 0.96%. This is higher than the average ratio in 12 cities of Uzbekistan (0.15%), in 40 CA and the Caucasus cities (0.88%), in Tajikistan (0.31%), Azerbaijan (0.38%) and Kyrgyzstan (0.58%).

GEORGIA

The 40 CA and the Caucasus cities rating included 3 cities of Georgia – Tbilisi, Batumi, and Kutaisi.

The population of 3 cities of Georgia is 1.42 mln cities, or 6.7% of the population in 40 CA and the Caucasus cities, or 27.9% of the population of 6 Caucasus cities.

The GRP volume of 3 cities of Georgia is 10.3 bln USD or 3.7% of the GRP volume of 40 CA and the Caucasus cities. For reference, the indicator of 3 cities is equal to the GRP of Aktau city (10.1 bln USD).

Generally, the capital of Georgia Tbilisi ranked 3rd in the overall rating with 382 points.

In general, Tbilisi ranks 13th out of 40 cities in the GRP per capita with 6,556 USD. The level of Tbilisi is almost equal to the GRP per capita of Kostanay (6,673 USD), and the population of Tbilisi almost 4.7 times exceeds the population of Kostanay.

Table 45 demonstrates that Tbilisi holds high positions in 8 indicators: GRP per capita (6,556USD), imports per capita (2,050USD), average salary (471.5USD), HDI (0.780), R&D costs per capita (19.6USD), the ratio of small businesses to population (1.68%), two emissions indicators (1.64 kg per capita and the total environmental emissions – 1.9 thousand tons) and the ratio of migration balance to population (0.81%).

The city has the medium positions in 4 indicators: exports per capita (753USD), investments per capita (1,109USD), tourists per capita (0.510) and the ratio of crimes to population (0.29%).

Tbilisi has a rather low score only in the balance of exports and imports per capita (6th out of 40).

It should be noted that Tbilisi received the highest rating among the 3 cities of Georgia and ranked 3rd among the 40 CA and the Caucasus cities with a total score of 382. Batumi holds the 6th position with a total score of 366. Kutaisi city demonstrated the lowest result among the 3 cities of Georgia and ranked 22nd in the overall rating with a score of 251 (Table 46).

In general, 2 cities of Georgia are in the top 10 cities of the 40 cities rating.

Table 46.

Total scores of Tbilisi, Batumi, and Kutaisi in 14 indicators

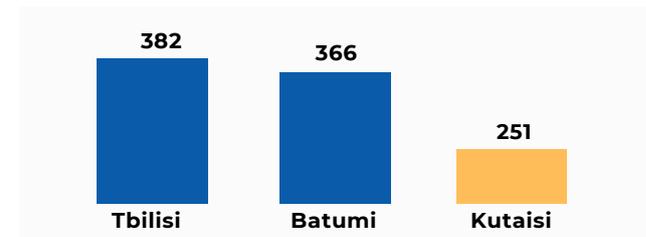
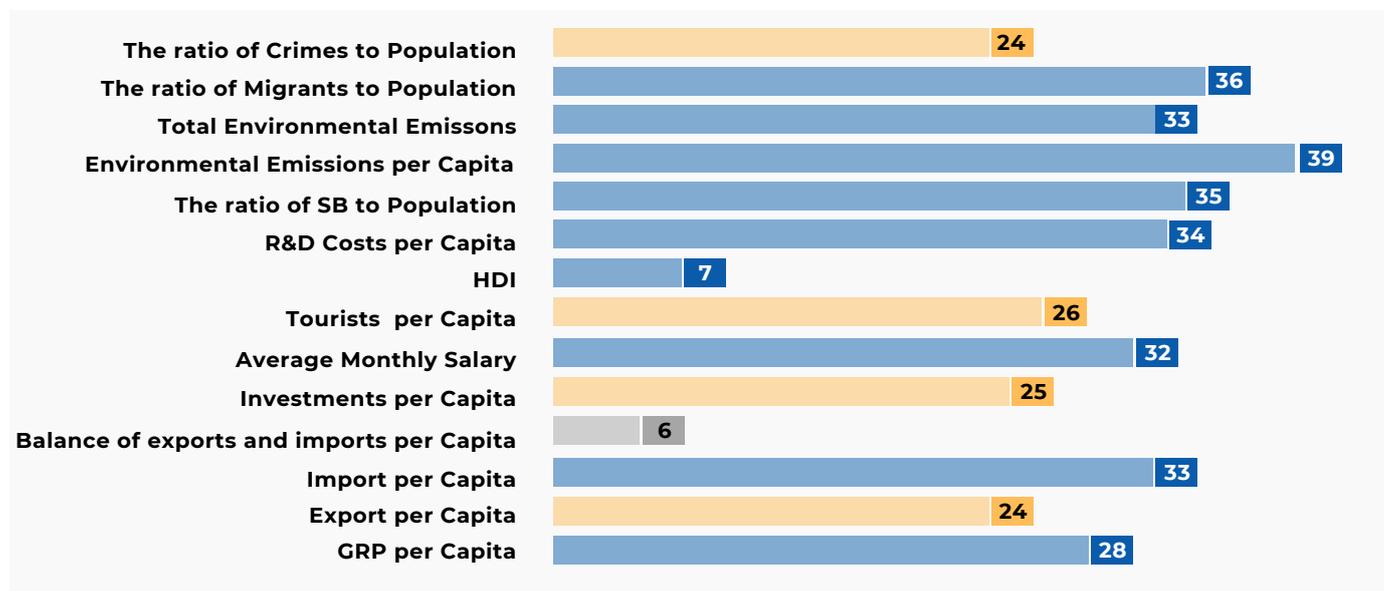


Table 45.

Scores of Tbilisi in 14 indicators



A detailed analysis of the scores of 3 cities of Georgia in 14 indicators shows a very interesting picture (Table 47).

Almost all cities of Georgia have equal positions in 5 indicators: exports per capita, imports per capita, HDI, R&D costs per capita, number of small businesses and the ratio of crimes to population.

It should be noted that R&D costs of 3 cities amount to about 3.1 mln USD, which is 1% of the total R&D costs in 40 CA and the Caucasus cities.

The cities of Tbilisi (0.510) and Kutaisi (0.458) have the same indicators in the number of tourists per capita. Three cities also have the same indicators in the ratio of crimes to population: Tbilisi - 0.29%, Batumi - 0.26% and Kutaisi - 0.20%.

Among the cities of Georgia, Batumi leads in indicators of exports (1,356USD), imports per capita (3,693USD), a number of tourists per capita (0.933), the ratio of small businesses to population (2.34%) and total emissions in the environment (1.5 thousand tons).

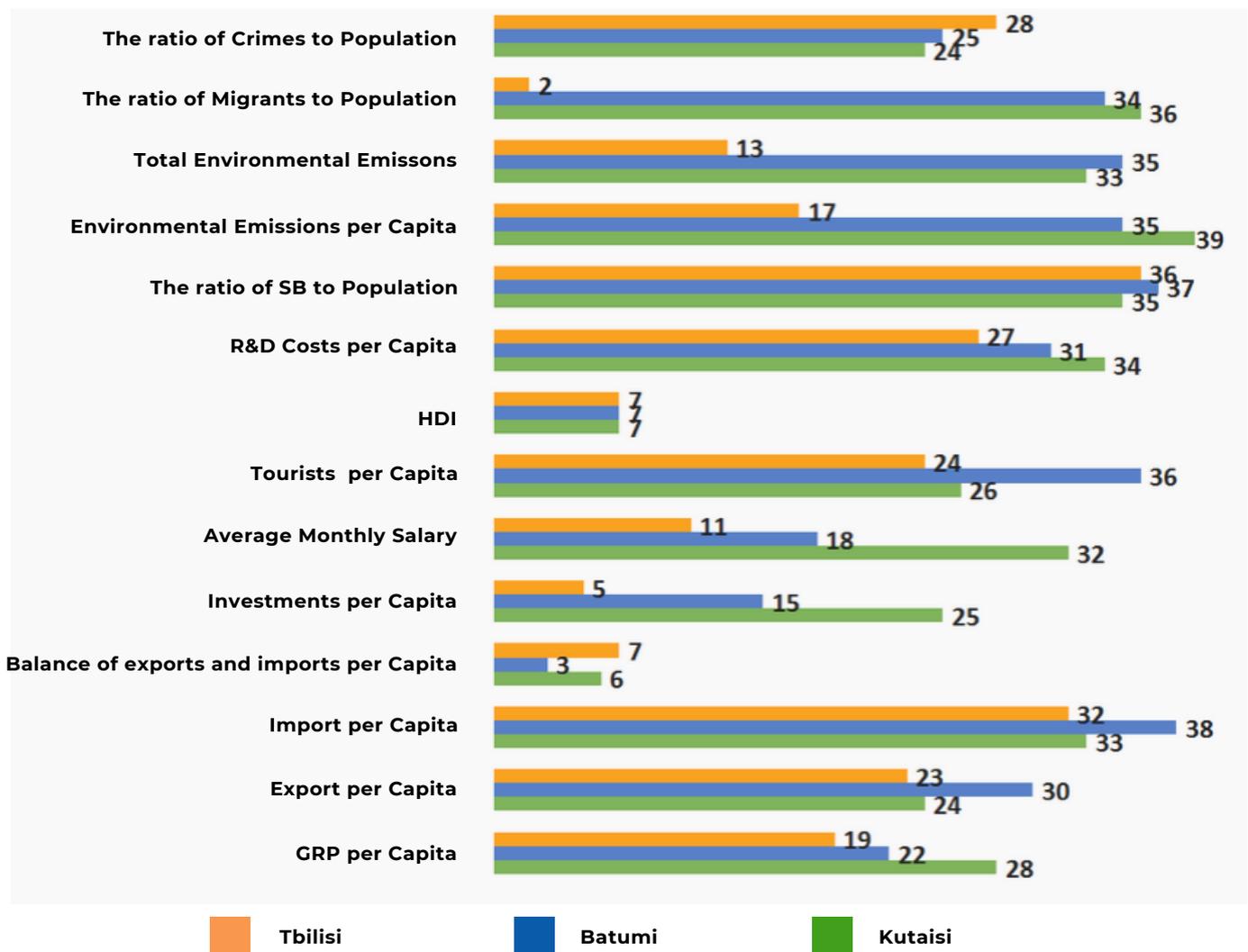
The city of Kutaisi is the leader among 3 cities in exports and imports per capita (-1,162USD) and has a low crime rate (0.20%).

Kutaisi also has low scores in the ratio of migrants to population (-1.23%) and investments per capita (205USD).

In addition, it can be noted that Kutaisi has high environmental emissions in kg and ranks 3th in the overall rating. Generally, if the average volume of environmental emissions in kg per capita in 3 cities of Georgia is low (14.8 kg), in Kutaisi this indicator is the highest - 38.4 kg per capita

Table 47.

Scores of 3 cities of Georgia in 14 indicators



Moreover, all the three cities in Georgia have a low balance of exports and imports per capita. This is due to the high rate of city imports.

One of the important reasons for high imports may be the low productivity of the industry, education and science sectors. For example, the average R&D costs per capita of 3 cities in Georgia are only 13.4 USD.

As for environmental emissions of 3 cities of Georgia, they amount to 22.5 thousand tons per year. This is equal to 1.7% of the total volume of all 40 CA and the Caucasus cities. Within this, the share of Tbilisi among 3 cities is 84.8% and 1.5% among 40 cities. This indicates low industrialization of the regional cities, in contrast to the higher industrialization of the regional cities of Kazakhstan.

The most attractive indicator is the low crime rate in the cities of Georgia, which is favorably associated with the high tourist potential of cities.

The average ratio of crimes to the population in the three cities is 0.25%. This is lower than in 40 CA and the Caucasus cities (0.88%), as well as in 17 cities of Kazakhstan (1.71%), in Armenia (0.96%), in Tajikistan (0.31%), Azerbaijan (0.38%) and Kyrgyzstan (0.58 %).

Generally, the crime rate of 3 cities is the third-lowest indicator among the countries of Central Asia and the Caucasus, after Ashgabat and the cities of Uzbekistan.

Thus, we can draw the following conclusions from a detailed analysis of the Central Asian and the Caucasus cities:

1. 2 cities of Georgia received high scores in most of the indicators and entered Top-10 cities of the overall rating.
2. Cities of Kazakhstan lead in the level of economic potential.
3. Cities of Kazakhstan and Azerbaijan are the leaders in R&D costs.
4. Cities of Georgia, Uzbekistan, and Turkmenistan have the lowest crime rates.



OVERALL RATING

OF 40 CA AND THE CAUCASUS CITIES

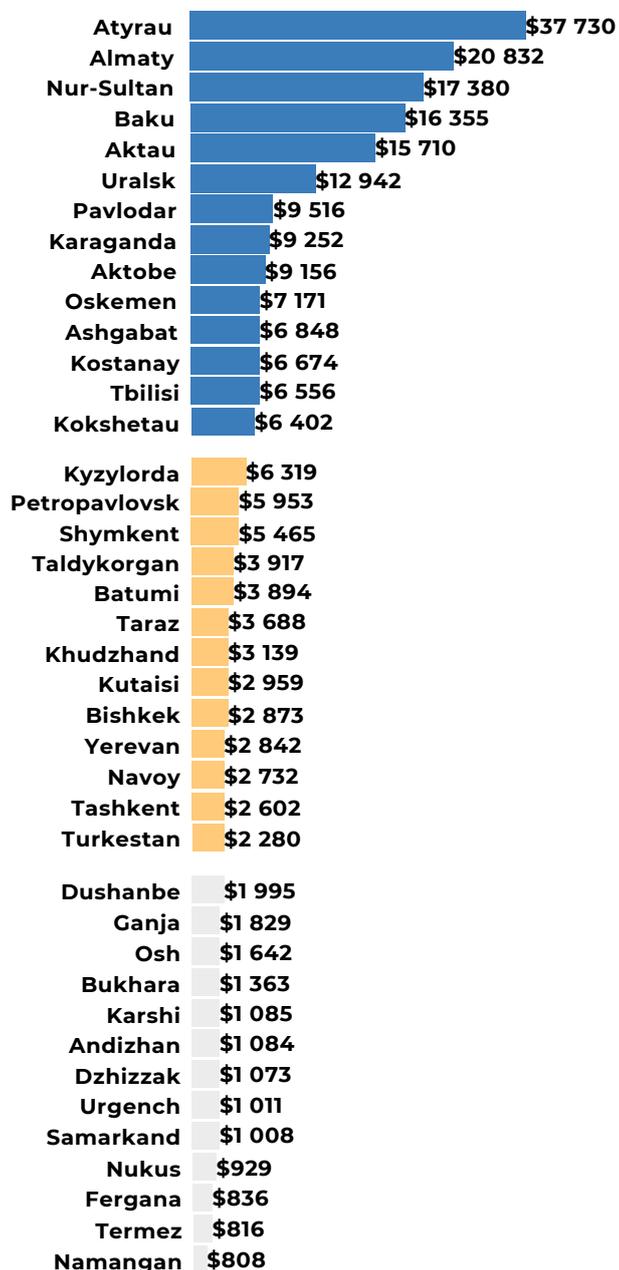


OVERALL RATING OF 40 CA AND THE CAUCASUS CITIES

Table 48 demonstrates 40 CA and the Caucasus cities by the GRP per capita.

Table 48.

40 cities by GRP per capita, USD



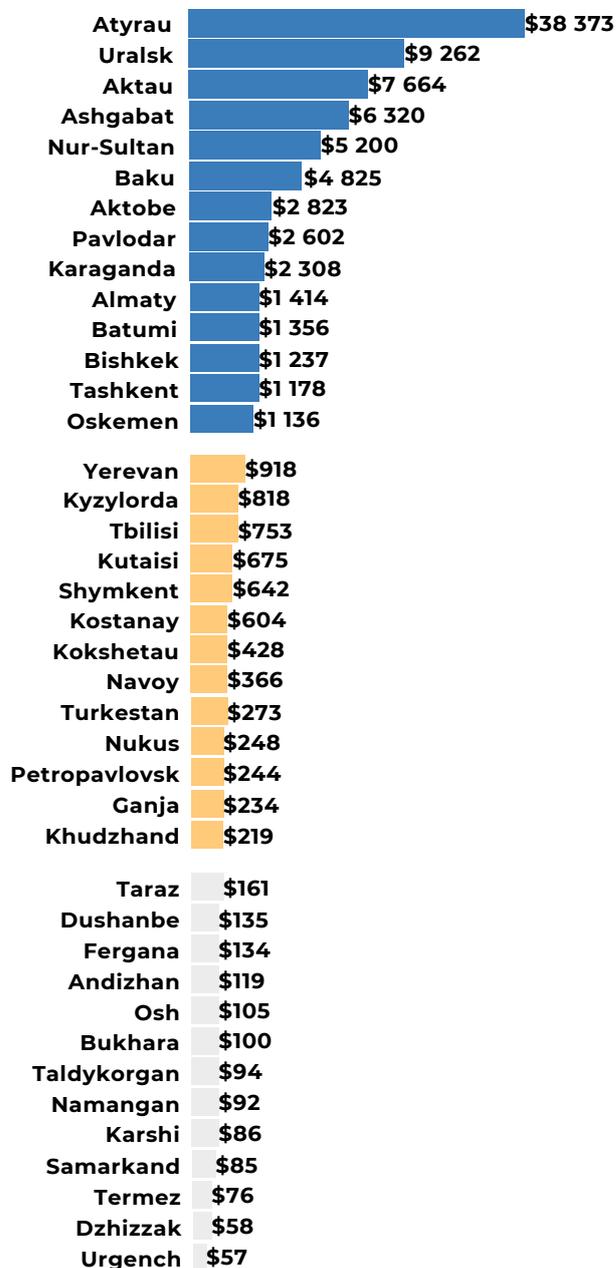
Top 10 of the CA and Caucasus cities rating by GRP per capita included 9 cities of Kazakhstan and 1 city of Azerbaijan.

The average GRP per capita for the top 10 CA and the Caucasus cities is 15,559 USD, with the average indicator for 40 cities equal to 6,155 USD.

Table 49 demonstrates 40 cities by exports per capita.

Table 49.

40 cities by exports per capita, USD



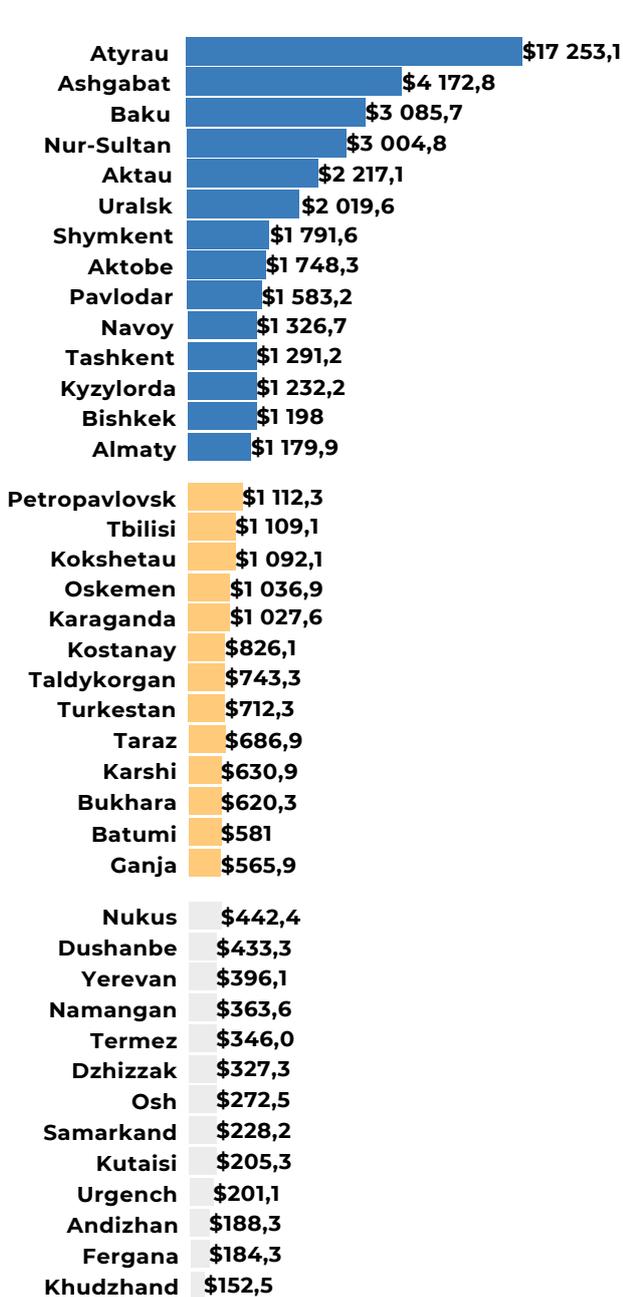
Top 10 of the CA and Caucasus cities rating by exports per capita included 8 cities of Kazakhstan, 1 city of Turkmenistan and 1 city of Azerbaijan.

The average exports per capita for the top 10 CA and the Caucasus cities is 8,079 USD, with the average indicator for 40 cities equal to 2,335 USD.

Table 50 demonstrates 40 cities by volume of investments per capita.

Table 50.

40 cities by investments per capita, USD



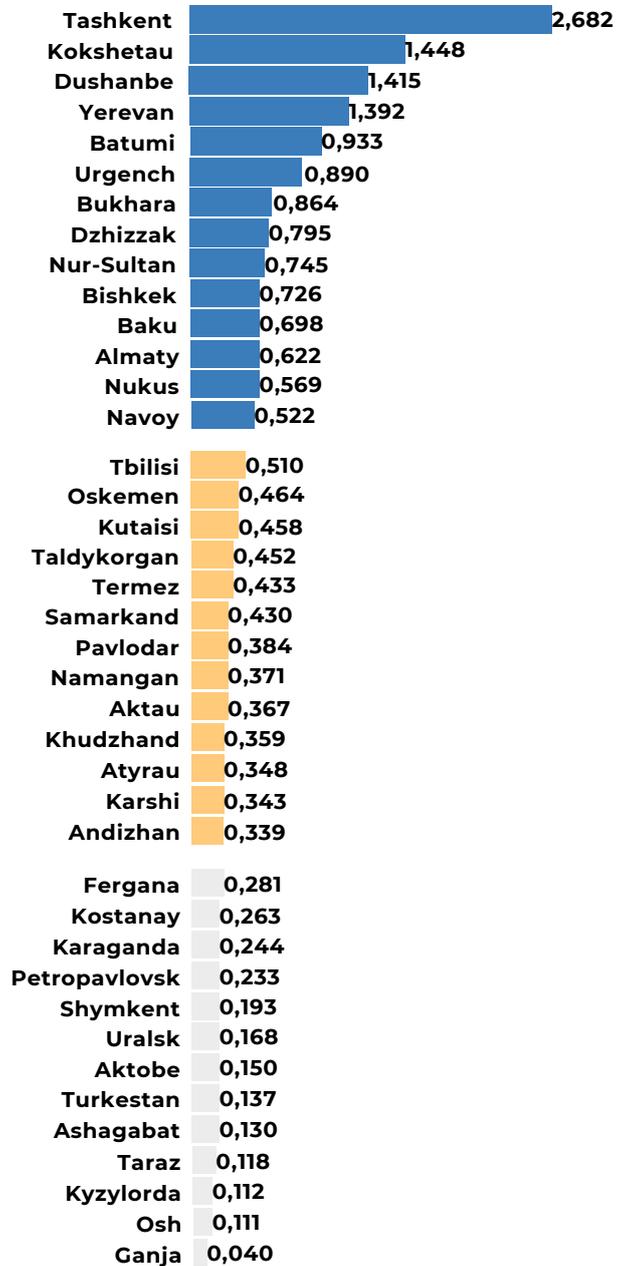
Top 10 of the CA and Caucasus cities rating by investments per capita included 7 cities of Kazakhstan, 1 city of Turkmenistan, 1 city of Azerbaijan and 1 city of Uzbekistan.

The average investments per capita for the top 10 CA and the Caucasus cities is 3,820USD, with the average indicator for 40 cities equal to 1,439 USD.

Table 51 demonstrates 40 cities by the ratio of tourists to the population.

Table 51.

40 cities by the ratio of tourists to population



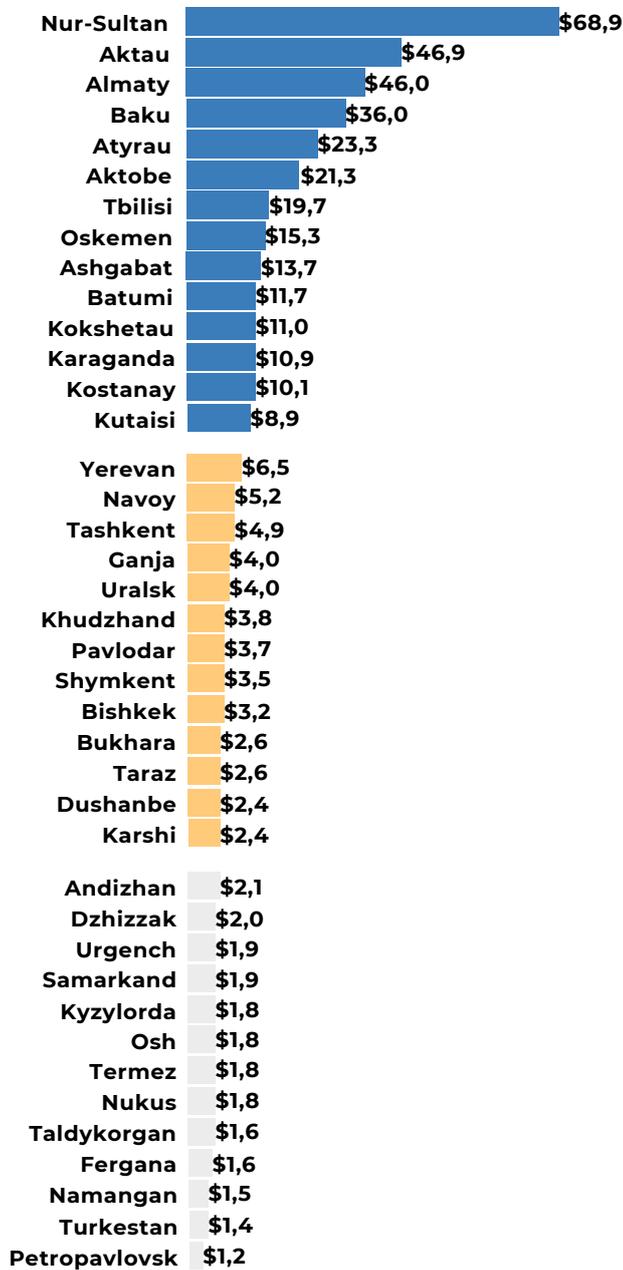
Top 10 of the CA and Caucasus cities rating by the ratio of tourists to population included 3 cities of Uzbekistan, 2 cities of Kazakhstan, 1 city of Georgia, 1 city of Armenia, 1 city of Tajikistan and 1 city of Kyrgyzstan.

The average number of tourists to the population for the top 10 CA and the Caucasus cities is 1.189, with the average indicator for 40 cities equal to 0.543.

Table 52 demonstrates 40 cities by R&D costs per capita.

Table 52.

40 cities by R&D costs per capita, USD



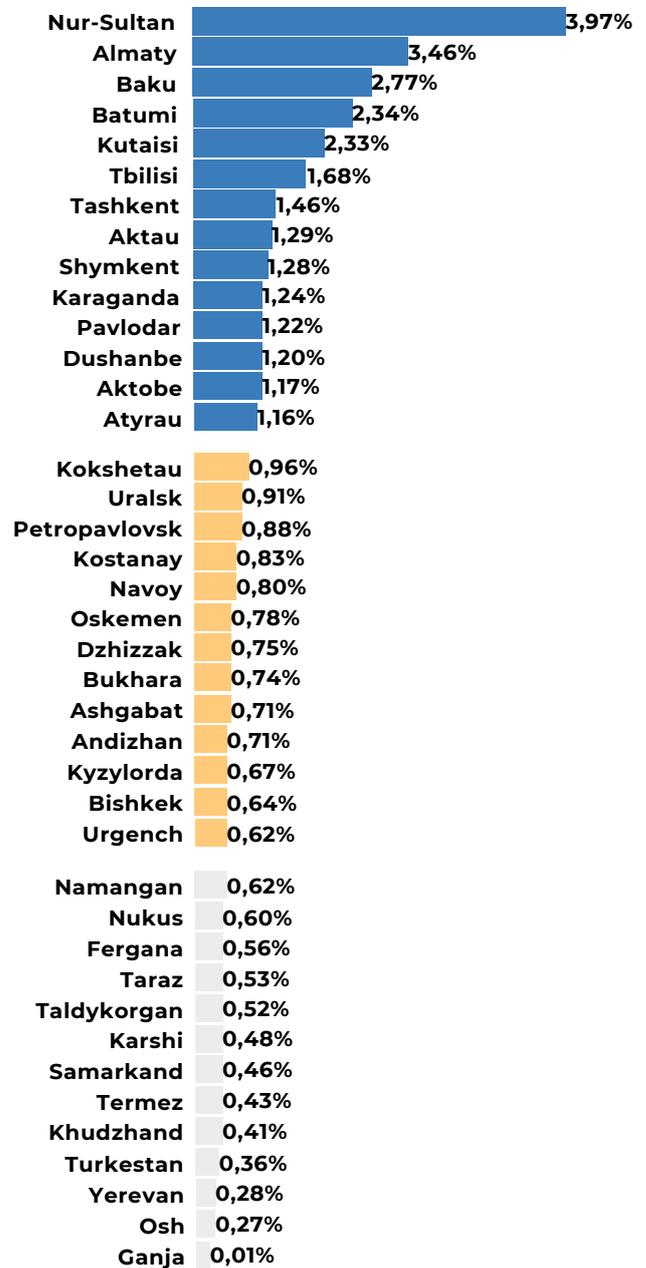
Top 10 of the CA and Caucasus cities rating by R&D costs per capita included 6 cities of Kazakhstan, 2 cities of Georgia, 1 city of Azerbaijan and 1 city of Turkmenistan.

The average R&D costs per capita for the top 10 CA and the Caucasus cities is 30.27 USD, with the average indicator for 40 cities equal to 10.37 USD.

Table 53 demonstrates 40 cities by the number of small businesses per capita.

Table 53.

40 cities by the ratio of small businesses to population, %



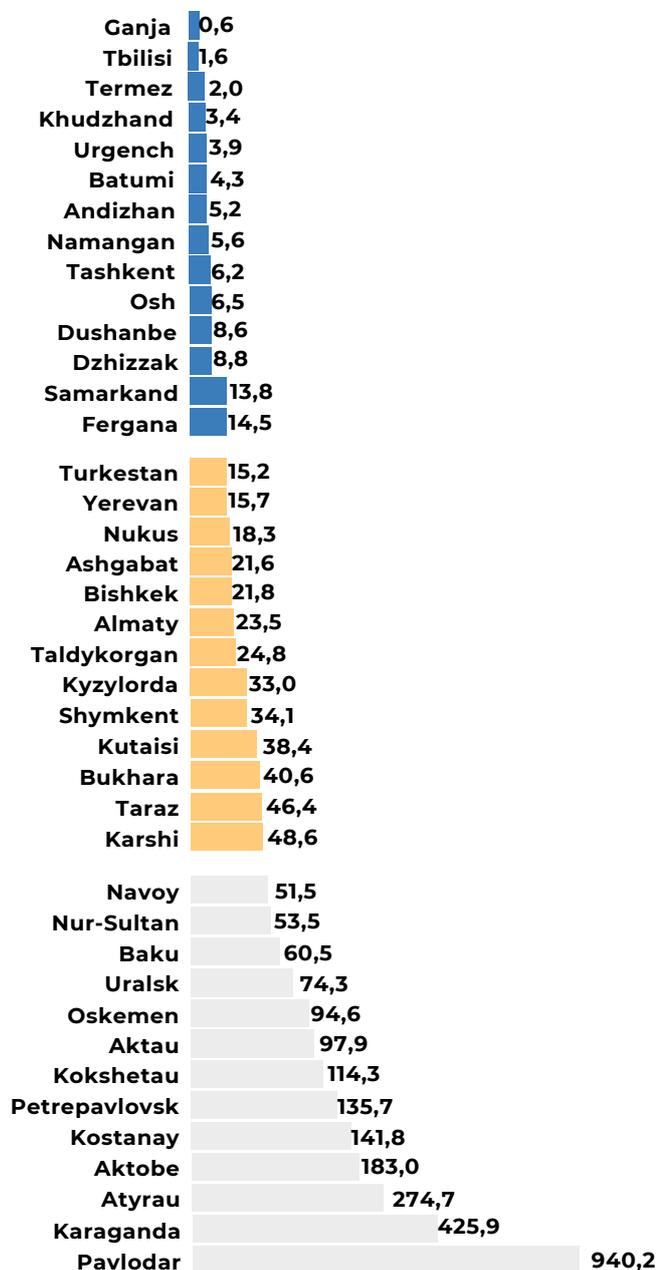
Top 10 of the CA and Caucasus cities rating by the number of small businesses per capita included 5 cities of Kazakhstan, 3 cities of Georgia, 1 city of Azerbaijan and 1 city of Uzbekistan.

The average ratio of small businesses to the population for the top 10 CA and the Caucasus cities is 2.18%, with the average indicator for 40 cities equal to 1.05%.

Table 54 demonstrates 40 cities by environmental emissions per capita.

Table 54.

40 cities by environmental emissions per capita, kg



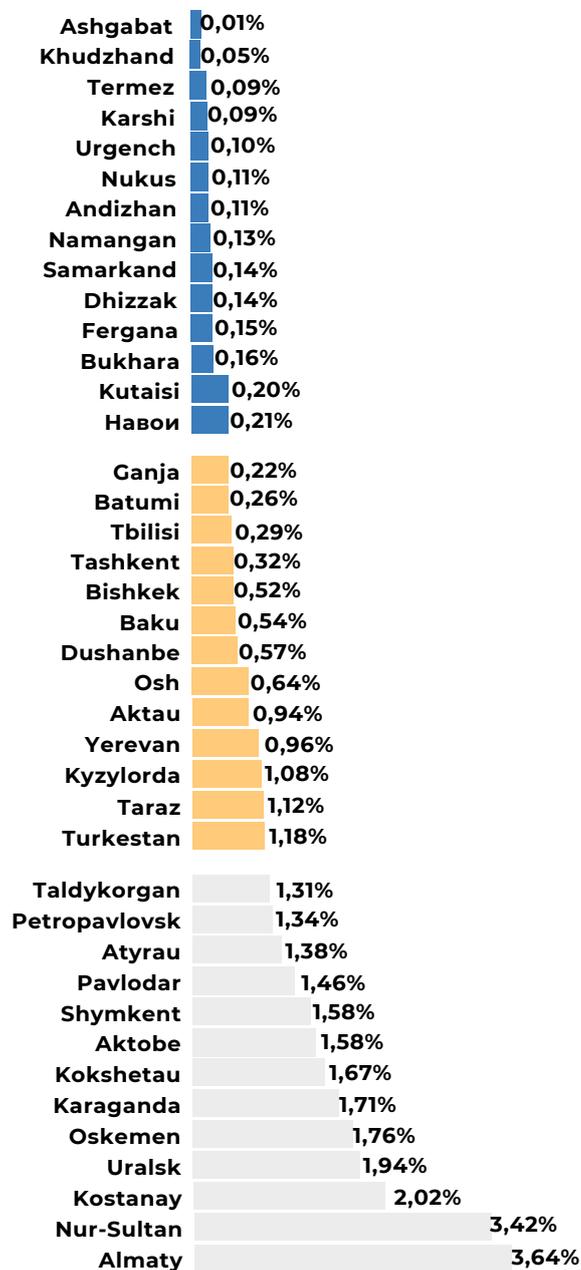
Top 10 of the CA and Caucasus cities rating with the lowest environmental emissions per capita included 5 cities of Uzbekistan, 1 city of Azerbaijan, 2 cities of Georgia, 1 city of Tajikistan and 1 city of Kyrgyzstan.

The average environmental emissions in kg per capita for the top 10 CA and the Caucasus cities are 3.93 kg, with the average indicator for 40 cities equal to 77.8 kg.

Table 55 demonstrates 40 cities by the ratio of crimes to population.

Table 55.

40 cities by the number of crimes per capita, %



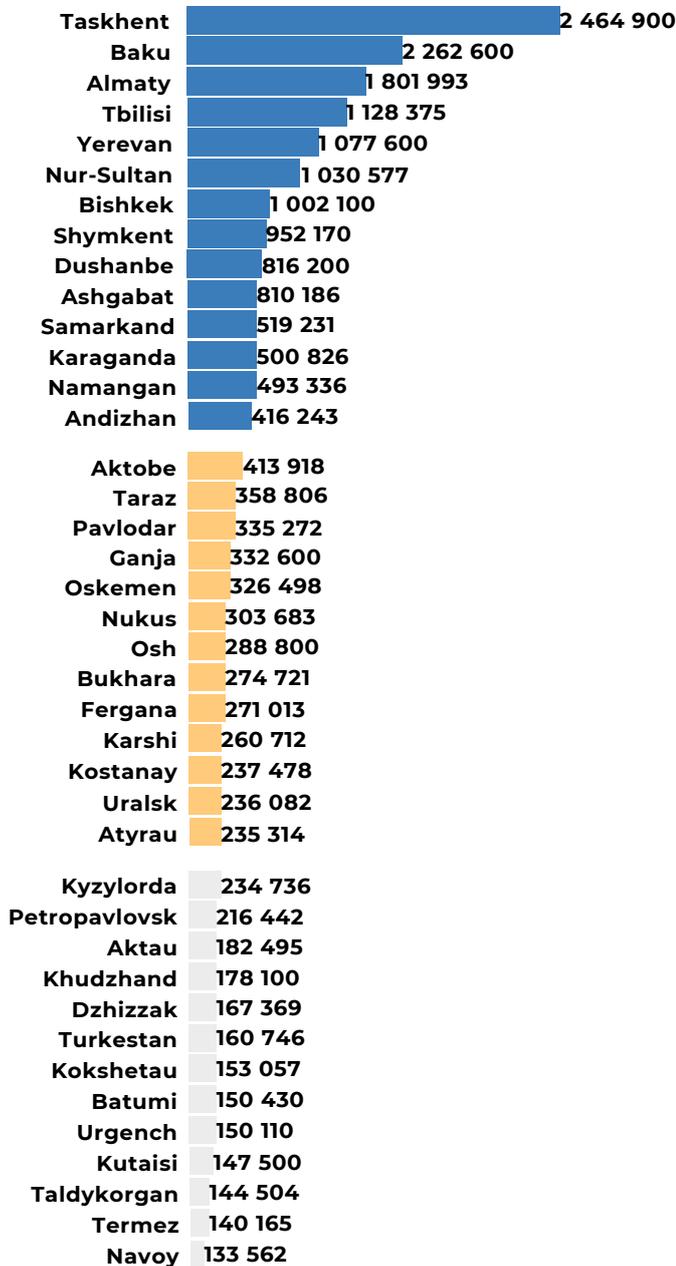
Top 10 of the CA and Caucasus cities rating with the lowest crime rate per capita included 8 cities of Uzbekistan, 1 city of Turkmenistan and 1 city of Tajikistan.

The average ratio of crimes to the population for the top 10 CA and the Caucasus cities is 0.1%, with the average indicator for 40 cities equal to 0.88%.

Table 56 demonstrates 40 cities by the population in 2018.

Table 56.

40 CA and the Caucasus cities by the population in 2018.

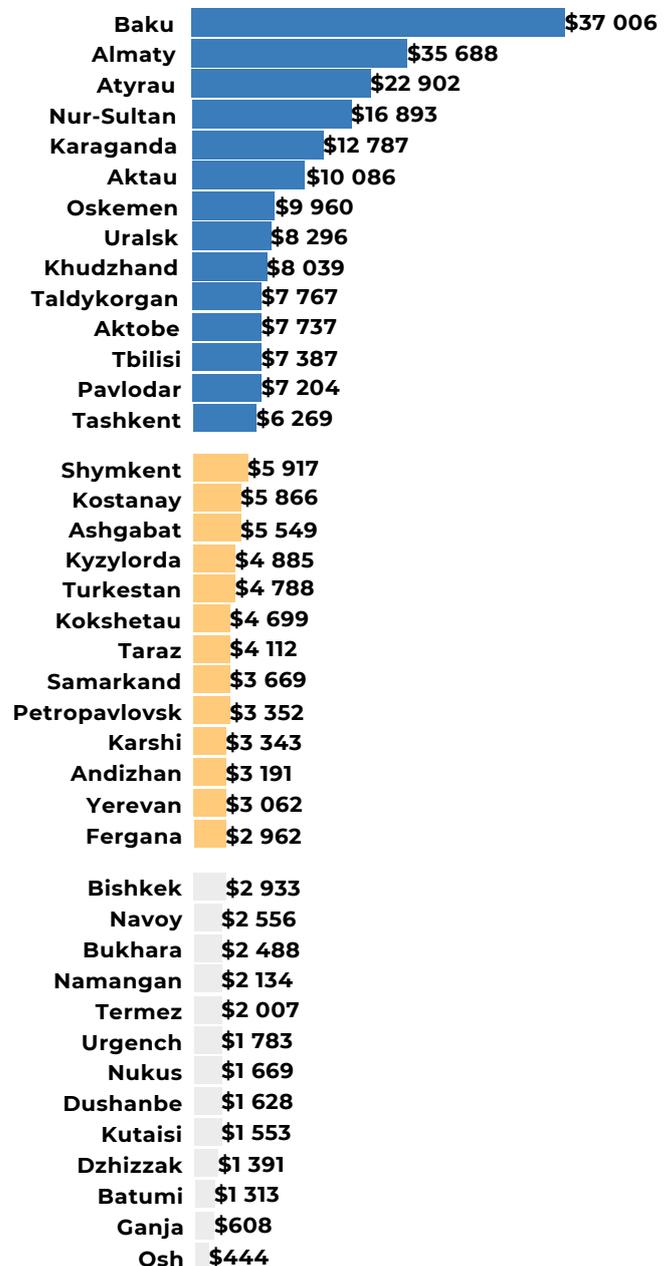


The top 10 cities in the Central Asian and the Caucasus cities rating by population included 1 city of Uzbekistan, 1 city of Azerbaijan, 3 cities of Kazakhstan, 1 city of Georgia, 1 city of Armenia, 1 city of Kyrgyzstan, 1 city of Tajikistan and 1 city of Turkmenistan.

Table 57 demonstrates 40 cities by the GDP in mln USD in 2018.

Table 57.

40 CA and the Caucasus cities by the GDP volume, mln USD

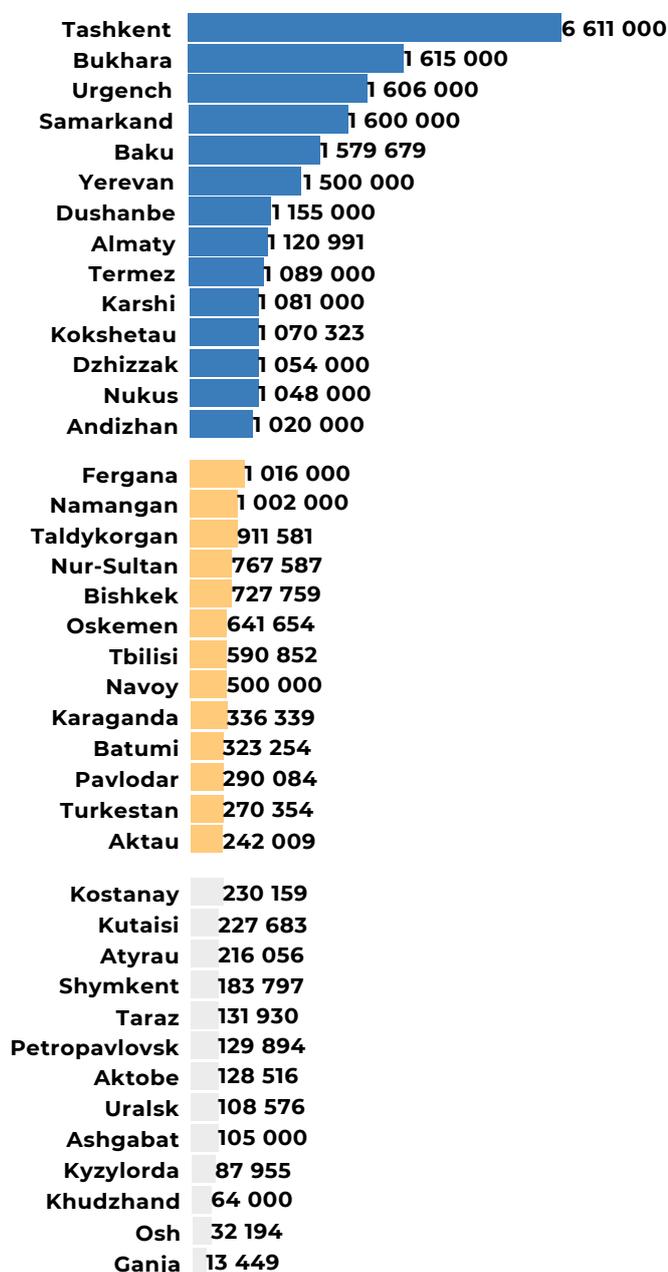


The top 10 of the Central Asian and Caucasus cities rating by the GDP volume included 1 city of Azerbaijan, 8 cities of Kazakhstan, and 1 city of Tajikistan.

Table 58 demonstrates 40 cities by the number of tourists.

Table 58.

40 CA and the Caucasus cities by number of tourists



The total number of tourists who visited the 40 CA and the Caucasus cities in 2018 is 32.4 mln.

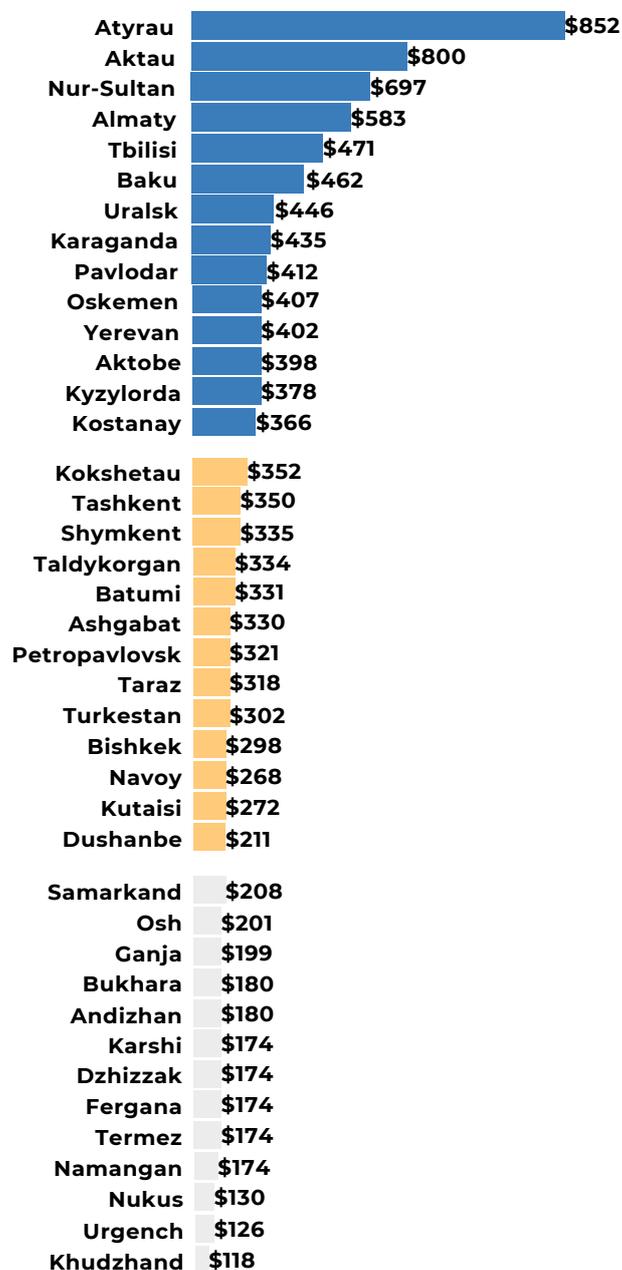
Top 10 cities were visited by 18.9 mln people or 58.4% of the total number of tourists of 40 cities under review.

The top 10 of the CA and Caucasus cities rating by number of tourists included 6 cities of Uzbekistan, 1 city of Azerbaijan, 1 city of Tajikistan, 1 city of Armenia, 1 city of Kazakhstan.

Table 59 demonstrates 40 cities by the average salary.

Table 59.

40 CA and the Caucasus cities by average salary, USD



The top 10 of the CA and Caucasus cities rating by salary included 8 cities of Kazakhstan, 1 city of Azerbaijan, 1 city of Georgia.

The following conclusions can be drawn from the analysis of the CA and the Caucasus cities on the top 10 cities rating:

1. A city from each country was included in the top 10 list of cities at least once.

2. Kazakhstan, Uzbekistan, Georgia, Azerbaijan, and Turkmenistan are the leaders by the number of cities included in the top 10 list.
3. Cities of Kazakhstan lead in almost all economic indicators.

CONCLUSION

The main mission of the review was to define the competitiveness rating of 40 CA and the Caucasus cities by 14 indicators. The rating was based on the indicators that characterize the level of the economy, innovations, social area, ecology and the crime rate in the cities.

The initial data were received from official statistical sources published by the statistical agencies of the Central Asian and the Caucasus countries.

The US dollar was accepted to facilitate the comparison and to calculate indicators in monetary terms, and indicators were mostly assessed in relation to the population of cities (per capita).

For convenience, a table with indicators and calculations is compiled in Microsoft Excel to compare 40 cities.

The main analysis period is 2018. In the absence of data for 2018, the latest available indicators from official sources were applied. In the table, data available by year is specified in the note (view through Microsoft Excel).

INDICATORS

A statistical method, which provides the search, calculation, and comparison of indicators, was used in the analysis of cities.

In order to define the competitiveness of cities and the position of each city in the overall rating, 14 key indicators were selected.

These indicators are as follows:

- 1) GRP per capita;
- 2) Exports per capita;
- 3) Imports per capita;
- 4) Balance of exports and imports per capita;
- 5) Investments per capita;
- 6) Average salary;
- 7) The ratio of tourists to population;
- 8) Human capital development index;
- 9) R&D costs per capita;
- 10) The ratio of small businesses to population;
- 11) Environmental emissions from stationary sources per capita;
- 12) Total environmental emissions of a city;
- 13) Ratio of migration balance to population;
- 14) Ratio of crimes to population.

Each rating indicator is selected taking into account its impact on the city's attractiveness, tourism, working and recreation environment, and living conditions.

1) GRP per capita – this indicator demonstrates the GRP level per 1 person. This indicator is the most useful for comparing the GRP volume performance of cities. The use of the GRP per capita can demonstrate the effectiveness and productivity of a city for 1 person. The GRP is difficult to evaluate by industry performance due to the lack of statistics.

The formula to calculate the city's GRP per capita:

- The city's GRP per capita = the city's GRP for the reporting period/average population of the city for the reporting period.

The GRP published on the official websites of the government authorities of the cities under review was used to calculate the rating.



2) Exports per capita – this indicator demonstrates the economic level of a city by products and services demanded in external markets. In general, this indicator specifies the level of industrial, technological and innovative activity of a city.

Exports per capita can be used to compare the world cities having various economic indicators.

Export indicators are regularly published on the official websites of the government authorities. At the regional level, such indicators are published only for major cities of the world, and in Kazakhstan - for 3 major cities. In this regard, and given the fact that more than 70% of production companies are concentrated in regional centers, exports per capita for regional cities are calculated taking into account the indicators of the regions.

The formula to calculate export per capita:

- Export per capita = export (by region/city) for the reporting period/average population (in the region/city) for the reporting period.



3) Imports per capita - this indicator also shows the economic level of a city for the purchasing the products and services supplied from foreign markets. In general, it shows the level of business activity of a city's residents and the processing industry development level.

Imports per capita is applied to compare different large and small cities.

Imports of cities per capita make it easy and quick to compare cities with different sizes of economies, population and industry specialization

Import indicators are regularly published on the official websites of authorized state bodies. At the regional level, such indicators are published only for large cities of the world, and for 3 major cities in Kazakhstan. In this regard, and given the fact that more than 70% of companies are concentrated in regional centers, imports per capita in regional cities are calculated taking into account the indicators of the regions.

The formula to calculate imports per capita:

- Imports per capita = imports (by region/city) for the reporting period/average population (in the region/city) for the reporting period.



4) The balance of exports and imports per capita or foreign trade turnover per capita indicates the effectiveness of the city's foreign trade operations.

In order to ensure the growth of the city's economic well-being, the foreign trade balance should be more than 0, i.e. positive. Therefore, this indicator is included in the rating and provides an additional score for the city's total rating.

Foreign trade balance per capita is regularly published on the official websites of authorized state bodies. At the regional level, such indicators are published only for major world cities, and for 3 main cities in Kazakhstan. In this regard, taking into account the fact that more than 70% of companies are concentrated in the regional centers, foreign balance per capita for regional cities is calculated given the regional indicators.

The formula to calculate the balance of exports and imports per capita:

- Balance of exports and imports per capita = exports (by the region/city) for the reporting period - imports (in the region/city) for the reporting period/average population (in the region/city) for the reporting period.



5) Investments per capita - an important indicator of the cities attractiveness for investments and capitalization. The more attractive the city, the greater the level of attracted investment.

A very useful indicator to compare large and small cities by level of investment attractiveness is the calculation of investments per capita.

Investments are regularly published on the official websites of the government authorities. At the regional level, such indicators are published only for major world cities, and for 3 main cities in Kazakhstan. In this regard, taking into account the fact that more than 70% of companies are concentrated in the regional centers, investments per capita for regional cities are calculated given the regional indicators.

The formula to calculate investments per capita:

- Investments per capita = investments (by region/city) for the reporting period/average population (in the region/city) for the reporting period



6) The average salary in the city - an indicator of living standards and well-being of citizens, as well as their buying capacity.

Average salaries are regularly published on the official websites of the government authorities.

When calculating average salaries, data of the regions was used, except for major cities with statistics available in the official sources of the government authorities (capitals and cities of republican subordination).



7) Tourists per capita - this indicator defines the city's tourism attractiveness calculated per person.

The number of tourists is regularly published on the official websites of the government authorities.

Formula to calculate the number of tourists per capita:

- A number of tourists per capita = number of tourists for the reporting period/average population.



8) Human Development Index - this index is created by the UN Development Program to demonstrate that a human and its abilities should be important parameters for assessing a country's development, along with generally accepted economic factors.

This index indicates the level of health and living environment of a person, the level of knowledge and capabilities of a country.

HDI index is regularly published on the UNDP official website for each UN member state.

The recent HDI indicators by countries were published on September 14, 2018.

Official UNDP data by countries was used to calculate HDI for the cities.



9) R&D costs per capita - this indicator characterizes the research and development costs of the cities. This is an important indicator to assess a city's innovative development.

R&D costs by countries are regularly published on the official websites of the government authorities.

The formula to calculate R&D costs per capita:

- R&D costs per capita = R&D costs of a city for the reporting period/average population of a city in the reporting period

If R&D costs data for a city is not available, R&D costs per capita can be calculated using the following formula.

R&D costs per capita = (GRP of a city*Share of budget R&D costs in the GDP of a country)/Average population



10) The ratio of small businesses to population characterizes business climate for the opening of a business, as well as the degree of support provided for the development of SMEs in general. The higher the ratio of small businesses to the population, the higher the financing of businesses and the level of business environment is for doing business and opening startups.

The number of small businesses by group is regularly published on the official websites of the government authorities.

Formula to calculate the ratio of small businesses to population:

- The ratio of small businesses to population = Number of small businesses/Average population for the reporting period*100



11) Environmental emissions from stationary sources per capita – an indicator that evaluates the level of emissions per 1 resident of a city. This indicator is used as an element to measure environmental pollution for every resident of a city.

It also allows for understanding the environmental pollution intensity. For example, territories with a high population density and high environmental emissions are dangerous for living and do not attract citizens.

Emissions by metal groups and other elements are regularly published on the official websites of authorized state bodies.

Measurements in the Central Asian and the Caucasus countries are provided in thousand tons.

Emissions are also classified by stationary, mobile and transport sources.

Formula to calculate environmental emissions from stationary sources per capita:

- Environmental emissions from stationary sources per capita = Emissions of a city/Average population in the reporting period



12) Total environmental emissions from stationary sources – an indicator that shows total emissions of a city. This indicator is used as an element to measure environmental pollution for the living environment.

Emissions by metal groups and other elements are regularly published on the official websites of the government authorities.

Measurements in the Central Asian and the Caucasus countries are provided in thousand tons. Environmental emissions under this rating are calculated in thousand kg.

Emissions are also classified by stationary, mobile and transport sources.



13) The ratio of migration balance to population. This indicator demonstrates the attractiveness of a city for residents of other cities and countries. Cities with a negative balance are less attractive for living. The higher and the more positive the migration balance, the more attractive the city is for living, professional activities and recreation.

Migration indicators and migration balances are regularly published on the official websites of authorized state bodies.

The formula to calculate the ratio of migration balance to population:

- The ratio of migration balance to population = Migration balance of a city/Average population in the reporting period*100

The formula to calculate the migration balance of a city

- Migration balance of a city = Number of people arrived in a city – Number of people departed from a city



14) The ratio of crimes to population indicates the level of security for citizens and the criminal situation of a city. The lower the crime rate to the population, the safer the city can be considered for living or tourism.

Registered crimes for the reporting period are regularly published on the official websites of the government authorities.

The formula to calculate the ratio of crimes to population:

- The ratio of crimes to population = Number of registered crimes of a city for the reporting period/Average population in the reporting period*100

CITY SELECTION

The main criterion for the selection of 40 cities in the ranking was the indicator of population, namely, cities in which the population exceeds 150 thousand people.

At the same time, an exception and one of the conditions was that these cities have the status of a republican level or regional center.

STATISTICS AVAILABILITY

Hoping that this material will be read by representatives of the 40 CA and the Caucasus cities, as well as in order to improve the statistical systems of cities for data collection and analysis, it is important to emphasize the advantages and disadvantages of official information and statistical systems of CA and the Caucasus countries in availability of information for collection and analysis.

The official statistical system is the website of the authorized state body with statistical data available on all areas of the living environment and economy of a country, regions, and cities. A statistical committee or agency is such an authorized body in each country.

Cities of Kazakhstan – the statistical system is helpful for finding information on many indicators, however, it was difficult to find information grouped by city. Information on many indicators is available only for the cities of republican subordination and for the regions.

The disadvantage is that the information is only available in tables and publications.

The website information is available in 3 languages: English, Russian and Kazakh.

Cities of Kyrgyzstan – the information and statistical system is helpful for getting access to the information by cities, including Osh city. The only disadvantage is the lack of an interactive map.

The website information was available in 3 languages: English, Russian and Kyrgyz.

Cities of Tajikistan – the information and statistical system was not very helpful for finding information. The number of available statistical compilations and publications is limited.

The website information was available in 3 languages: English, Russian and Tajik.

Cities of Turkmenistan – the information and statistical system is not useful and is almost undescriptive. Statistical compilations and publications are not available.

Brief information was available on the websites of international organizations or third-party sources.

The website information was available in 2 languages: Russian and Turkmen.

Cities of Uzbekistan – the statistical system is helpful for finding information on many indicators, however, it was difficult to find information grouped by city. Information on many indicators is available only for regions.

The website for Uzbekistan has a user-friendly interface.

The disadvantage is that information is only available in tables and publications.

The website information was available in 3 languages: English, Russian and Uzbek.

Cities of Azerbaijan – the information and statistical system complied with the requirements. An interactive map with statistical data for each region and the major city was provided on the website.

Data on many indicators are not available.

Much of the statistical data was dated 2017.

The website information was available in 2 languages: English and Azerbaijan.

Cities of Armenia – the information and statistical system complied with the requirements.

Much of the statistical data was dated 2017.

The website information was available in 3 languages: English, Russian and Armenian.

Cities of Georgia – the information and statistical system complied with the requirements. An interactive map with statistical data on each region was provided on the website.

Data on many indicators are not available.

Much of the statistical data was dated 2017.

The website information was available in 2 languages: English and Georgian.

Key conclusions on statistics availability:

1. Limited information about cities;
2. Information, available only on the websites of international organizations: 1) Human development index; 2) R&D share in GDP;
3. User-friendly interactive maps for information collection and analysis on the websites of statistical agencies of Azerbaijan and Georgia;
4. Outdated or incomplete information on the websites of statistical agencies of the Caucasus countries;
5. The lack of information about the cities of Turkmenistan on the website of the State Statistical Agency;
6. Information about some cities of Tajikistan and Turkmenistan was available in news portals and on the websites of international organizations;
7. Lack of calculations per capita or in relation to the population.

THE CALCULATION METHODOLOGY OF TOTAL RATING

The total rating of a city is calculated by summing up the city ratings of 14 indicators.

Taking into account that the competitiveness rating includes 40 Central Asian and the Caucasus cities, the total rating of cities in each indicator is calculated from 1 to 40, except for two indicators: average salary and HDI.

For country-average indicators, the rating is calculated by the number of not repeated and not identical indicators.

1) GRP per capita

The GRP per capita rating of a city is calculated from 1 to 40. Minimum – for the lowest GRP per capita, maximum – for the highest GRP per capita.

2) Exports per capita

The exports per capita rating is calculated from 1 to 40. Minimum – for the lowest exports per capita, maximum – for the highest exports per capita.

3) Imports per capita

The imports per capita rating is calculated from 1 to 40. Minimum – for the lowest imports per capita, maximum – for the highest imports per capita.

4) Balance of exports and imports per capita

The balance between exports and imports per capita rating is calculated from 1 to 40. Minimum – for the most negative balance of exports and imports, maximum – for the highest positive balance of exports and imports.

5) Investments per capita

The investments per capita rating is calculated from 1 to 40. Minimum – for the lowest investments per capita, maximum – for the highest investments per capita.

6) Average salary

The average salary rating is calculated from 1 to 36 since some cities have equal data on average salaries. Minimum – for the low average salary, maximum – for the highest average salary.

7) Number of tourists per capita

The number of tourists per capita rating is calculated from 1 to 40. Minimum – for the lowest number of tourists per capita, maximum – for the highest number of tourists per capita.

8) Human Development Index

The Human Development Index rating is calculated from 1 to 8. Minimum – for the low HDI, maximum – for the highest HDI.

9) R&D costs per capita

The R&D costs per capita rating is calculated from 1 to 40. Minimum – for the lowest R&D costs per capita, maximum – for the highest R&D costs per capita.

10) The ratio of small businesses to population

The ratio of small businesses to population rating is calculated from 1 to 40. Minimum – for the lowest ratio of small businesses to population, maximum – for the highest ratio of small businesses to population.

11) Environmental emissions from stationary sources per capita

The environmental emissions from stationary sources per capita rating are calculated from 1 to 40. Minimum – for the maximum environmental emissions per capita, maximum – for the lowest environmental emissions per capita.

12) Total environmental emissions from stationary sources

The total environmental emissions from stationary sources rating are calculated from 1 to 40. Minimum – for the maximum total environmental emissions, maximum – for the lowest total environmental emissions per capita.

13) The ratio of migration balance to population

The ratio of migration balance to population rating is calculated from 1 to 40. Minimum – for the lowest ratio of migration balance to population, maximum – for the highest ratio of migration balance to population.

14) The ratio of crimes to population

The ratio of registered crimes to population rating is calculated from 1 to 40. Minimum – for the highest ratio of registered crimes to population, maximum – the ratio of registered crimes to population.

15) Total rating score

The total rating score of each city is calculated by summing up the obtained scores for each of the 14 reviewed indicators.

Total rating scores are distributed in the range from 183 to 390 points. 183 points – the minimum total score, 390 – the maximum total score of the rating.

16) A city's position and place in the list of cities

A city's position is calculated on the basis of the final score.

Cities with identical final scores hold the same position or place in the rating.

Positions and places in the 40 cities rating ranged from 1 to 36.

Indicators in monetary terms were calculated in US dollars according to the national currency exchange rates in the reporting period (see Table D. Average exchange rates of the CA and the Caucasus countries against the US dollar, in the Annex).



RATING CALCULATION METHODOLOGY OF FOR 5 AREAS

The total aggregate rating of a city in 5 areas was calculated by summing up the equivalent rating of cities in 5 assessment areas.

Generally, the calculation of the total aggregate rating of each city in 5 directions includes the following actions:

- 1) Distribution of 14 indicators by 5 directions
- 2) Summing up rating scores for each area
- 3) Assessment of each city in 5 directions

The total aggregate rating in each of the 5 direction is calculated by the number of not repeated and not identical indicators.

1) Technological development and human capital

The technological development and human capital rating are based on the sum of scores in 2 indicators: 1) R&D costs per capita; 2) HDI.

The city's position is calculated on the basis of the final score. Cities with identical final scores hold the same rating position or place. Positions and places in the 40 cities rating ranged from 1 to 31. Based on the value obtained, each city was assigned a score from 1 to 31. Minimum – for the lowest value, maximum – for the highest value. This is due to the fact that identical aggregate ratings are obtained when summing up HDI and R&D scores. Within this, cities with identical scores received the same rating level.

Example:

The city of Baku obtained 6 points in HDI and 37 points in R&D costs per capita (see Table B: 40 CA and the Caucasus cities rating).

Formula to assess technological development and human capital (hereinafter - TDHC).

$TDHC = HDI \text{ score} + R\&D \text{ costs per capita score.}$

$TDHC \text{ score} = 6 + 37 = 43$ (see Table C-1part: 40 CA and the Caucasus cities rating).

TDHC rating of Baku is equal to the level of order between 1 and 31.

When sorting in descending order, the city ranks 5th after the cities of Nur-Sultan (1st position - 31 points), Aktau (2nd position - 30 points), Almaty (3rd position - 29 points), and Atyrau (4th position - 28 points).

Therefore, Baku, along with Aktobe, obtains 27 points out of 31 in the rating for technological development and human capital (see Table C-2part: 40 CA and the Caucasus cities rating).

2) Economic potential

The economic potential rating is based on the sum of scores in 6 indicators: 1) GRP per capita; 2) investments per capita; 3) the ratio of small businesses to population; 4) average salary; 5) a number of tourists per capita; 6) the ratio of migration balance to population.

The city's position is calculated on the basis of the final score. Cities with identical final scores hold the same rating position or place. Positions and places in the 40 cities rating ranged from 1 to 36. Based on the value obtained, each city was assigned a score from 1 to 36. Minimum – for the lowest value, maximum – for the highest value. Within this, cities with identical scores received the same rating level.

Example:

The city of Baku obtained 37 points in the GRP per capita, 38 points in investments per capita, 38 points in the ratio of SBs to population, 31 points in the average salary, 30 points in tourists per capita and 29 points in the ratio of migration to population (see Table B: 40 CA and the Caucasus cities rating).

The formula to assess the economic potential (hereinafter - EP).

$EP = GRP \text{ per capita score} + \text{investments per capita score} + \text{ratio of SBs to population score} + \text{average salary score} + \text{number of tourists per capita score} + \text{the ratio of migration to population score.}$

$EP \text{ score} = 37+38+38+31+30+29=203$ (see Table C-1part: 40 CA and the Caucasus cities rating).

EP rating of Baku is equal to the level of order between 1 and 36.

When sorting in descending order, the city ranks 2nd after the cities of Nur-Sultan (1st position - 36 points) and Almaty (2nd position - 35 points).

Therefore, Baku obtains 35 points out of 36 for the economic potential (see Table C-2part: 40 CA and the Caucasus cities rating).

3) Trade potential

The trade potential rating is based on the sum of scores in 3 indicators: 1) exports per capita; 2) imports per capita; 3) balance of exports and imports per capita.

The city's position is calculated on the basis of the final score. Cities with identical final scores hold the same rating position or place. Positions and places in the 40 cities rating ranged from 1 to 33.

Based on the obtained values, each city was assigned a score from 1 to 33. Minimum – for the lowest value, maximum – for the highest value.

Example:

The city of Baku obtained 35 points in exports per capita, 35 points in imports per capita, 33 points in the balance of exports and imports per capita (see Table B: 40 CA and the Caucasus cities rating).

The formula to assess the trade potential (hereinafter - TP).

TP = imports per capita score + exports per capita score + balance of exports and imports per capita score.

TP score = 35+35+33=103 (see Table C-1part: 40 CA and the Caucasus cities rating).

The TP rating of Baku is equal to the level of order between 1 and 33.

When sorting in descending order, the city ranks 3rd with a score of 31 after the cities of Atyrau (1st position - 33 points) and Ashgabat (2nd position - 32 points).

Aktau and Nur-Sultan also obtained 31 points (3rd position - 31 points).

Therefore, Baku obtains 31 points out of 33 in the trading potential rating (see Table C-2part: 40 CA and the Caucasus cities rating).

4) Environmental emissions

The environmental emissions rating is based on the sum of scores in 2 indicators: 1) environmental emissions per capita; 2) total environmental emissions of a city.

The city's position is calculated on the basis of the final score. Cities with identical final scores hold the same rating position or place. Positions and places in the 40 cities rating ranged from 1 to 33. Based on the value obtained, each city was assigned a score from 1 to 33. Minimum – for the lowest value, maximum – for the highest value.

Example:

The city of Baku obtained 11 points in environmental emissions per capita in kg and 3 points in the total environmental emissions of a city in kg (see Table B: 40 CA and the Caucasus cities rating).

The formula to assess environmental emissions (hereinafter - EE).

EE = environmental emissions in kg per capita score + total environmental emissions of a city in kg score.

EE score = 11+3=14 (see Table C-1part: 40 CA and the Caucasus cities rating).

EE rating of Baku is equal to the level of order between 1 and 33.

When sorting in descending order, the city ranks 35th.

Therefore, Baku obtains 5 points out of 33 for environmental emissions (see Table C-2part: 40 CA and the Caucasus cities rating).

5) Crime rate

The crime rate rating is fully based on the score in the ratio of crimes to the population. Each city is assigned a score of 1-40. Minimum – for the minimum rate of registered crimes, maximum – for the highest level of registered crimes.

The city of Baku obtained 20 points in the crime rate since only one indicator was used in the rate calculation. Therefore, the crime rate score is equivalent to the ratio of crime to population rating (see Table B: 40 CA and the Caucasus cities rating).

Position or place of a city in 5 key areas

The city's position is calculated on the basis of the final score.

Cities with identical final scores hold the same rating position or place.

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ABBREVIATIONS AND ACRONYMS

avg.	average
bln.	billion
c.	city
CA	Central Asia
CIS	Commonwealth of Independent States
CR	Crime rate
EE	Environmental emissions
EP	Economic potential
etc.	Et cetera
GDP	Gross Domestic Product
GRP	Gross Regional Product
HDI	Human development index
ISPG	International Strategy Partners Group
kg.	kilogram
mln.	million
per cap	(per) capita
R&D	Research and development
RK	Republic of Kazakhstan
SB	Small businesses
SMB	Small and medium businesses
TDHC	Technological development and human capital
thous.	Thousand
TP	Trade potential
UN	United Nations
UNDP	United Nations Development Program
UNDP HDI	United Nations Development Program Human Development Index
USA	United States of America
УА	Union of Soviet Socialist Republics
USSR	International Strategy Partners Group

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Tajikistan	https://www.stat.tj/ru/ https://investcom.tj/langru.html http://avesta.tj/2019/02/08/tadzhikistan-v-2018-godu-posetili-svyshe-1-1-mln-inostrannyh-turistov/ https://tajikta.tj/ru/news/v-khudzhande-tadzhikistana-otkrylas-kanatnaya-doroga https://regnum.ru/news/economy/2568112.html
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Tokyo	https://en.wikipedia.org/wiki/Tokyo https://en.wikipedia.org/wiki/Crime_in_Japan
Moscow	http://moscow.gks.ru/wps/wcm/connect/rosstat_ts/moscow/ru/statistics/grp/
Minsk	http://minsk-city.belstat.gov.by/ofitsialnaya-statistika/osnovnye-pokazateli/valovoi-regionalnyi-produkt/
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