HOW REAL IS MIGRATION'S CONTRIBUTION TO THE POPULATION CHANGE IN MAJOR URBAN AGGLOMERATIONS?

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Abstract: Migration acts as a growth driver for urban agglomerations, posing a difficult methodological task of its statistical accounting as well as further assessment of migration's impact on the economy of agglomerations. The paper analyzes the contribution of migration to the change in population during the intercensal interval 2010–2021 in 20 urban agglomerations of Russia identified as promising centers of economic growth by the Russian Federation Government Decree "On Approval of the Spatial Development Strategy of the Russian Federation for the period until 2025". The study showed that the most underestimated net migration rate was demonstrated by the agglomerations of Krasnodar, distantly followed by Krasnoyarsk and the capitals (Moscow and Saint Petersburg). The leader in terms of the absolute value of unrecorded migration is the Moscow agglomeration. In Nizhny Novgorod and Perm agglomerations, indirect assessment of net migration showed that migration balance was overestimated as per the registered migration data. The identified differences in the volume of net migration between the two sources indicate the unreliability of the data, thus questioning in some urban agglomerations the alignment of the demographic potential with economic development goals.

Keywords: urban agglomerations; migration; census; spatial development strategy; Russia

1. Introduction

The principal trends of Russia's spatial development are the concentration of population and economy in major (largest and large) urban agglomerations and their increased role in the population's livelihood activities. Adopted in 2019, the Government Decree "On Approval of the Spatial Development Strategy of the Russian Federation for the period until 2025" (2019) defines 20 cities as promising major centers of economic growth in Russia. Those cities make up large and largest urban agglomerations that are to annually contribute over 1% to the economic growth of Russia. The population of the 20 agglomerations according to the 2021

census is 58.9 million people or 40% of the total population of Russia (Federal State Statistics Service [Rosstat], 2022a). The All-Russia population census was supposed to take place in 2020. However, due to the COVID-19 pandemic, the Census was conducted in 2021 and publication of its results took place only in 2022. From now on, to avoid confusion, we will refer to it as the 2021 All-Russia population Census. Meeting the declared economic goals is only possible as long as there is an adequate demographic potential, which, given the persisting depopulation trend in Russia, attaches relevance to and places a priority on the assessment of net migration in agglomerations.

Despite the importance of migrations as a key process leading to the growth of urban agglomerations, Russian statistics is fraught with quite a number of drawbacks preventing comprehensive accounting of migratory flows (Mkrtchyan, 2020). Net migration in Russian urban agglomerations is traditionally estimated as part of current statistics, i.e., data on migrants' registration at the place of their permanent or temporary residence. The imperfect nature of information collected in this way increases the importance of conducting censuses for assessing the real contribution of migration to the change in agglomerations population (Chudinovskikh & Stepanova, 2020; Mokrensky, 2018). Census data is also used to assess net migration in individual Russian regions (Bell et al., 2015; Rees at al., 2016; Shvorina & Faleychik, 2018; Vorobieva et al., 2016). Special attention is given to the impact of migration on the age structure of population in individual regions, major cities, and peripheral territories (Karachurina & Mkrtchyan, 2017; Kashnitsky, 2013; Khramova et al., 2022).

The primary factor behind the formation of urban agglomerations is the concentration of migratory flows, which boosts the emergence of new social, economic, and transport connections among the constituent parts of agglomerations (Shmidt et al., 2016). As a rule, the cores of agglomerations receive much more economic benefits from the development of such connections than the periphery (especially in rural areas). However, under an adequate regional policy, peripheral territories may also be able to develop contemporary and efficient economy even given the prevailing trend toward population's concentration in the core (Bosworth & Venhorst, 2018).

The influx of young and economically active population acts as a driver of growth for urban agglomerations, which makes migration assessment and its contribution to the agglomerations economy an important goal. In particular, in the case of Russian agglomerations, we may note a palpable contribution of such a specific process as labor migration to the formation of local job markers (Makhrova et al., 2016). One of its modern forms is shift work (Chaika & Mizerovskaya, 2021), which is very similar to seasonal work of local peasants who used to come to large cities from neighboring regions in the Russian Empire in the late 19th and early 20th century.

While in the Soviet period the industrial potential of cities and budding urban agglomerations was a key factor of their growth, the 21st century has witnessed non-production factors coming into the fore: institutional factors, geographic location, quality of urban environment, etc. This is demonstrated by the results of analyzing the demographic dynamics of Russia's major agglomerations in 2012–2020 (Chernyshev, 2022). Migration appeal, in turn, depends on the availability of administrative resource enabling the government funds to flow to urban agglomerations. This state of affairs corresponds to the current organizational logic behind social and economic development differentiation on the territory of Russia. Zubarevich (2019) points out that back in the 2010s the institutional factor (extent of centrality within the

country's hypercentralized governance system) had a bigger impact on the prosperity of urban agglomerations than the very agglomerations effect that produced them did.

If we take a broader look at the Strategy's mission, we will see that it should allow downplaying the sharp disproportions in the economic potential (and hence in migration appeal) among Moscow, Saint Petersburg and at least other major Russian urban agglomerations. Therefore, this article may pose an interest as an analysis of one of the problematic segments of the Strategy and Russian statistics on the whole, which does not always provide promptness and precision of the statistical recording of migrations (Kuznetsova, 2019), particularly in the largest urban agglomerations where they are the most intense.

2. Method and data

Two sources were used to draw a comparative analysis of the population data: the 2021 All-Russia population census (Rosstat, 2022a) and the assessment of resident population size as of 1 January 2022, which was calculated by Rosstat (2022b) based on the current accounting of demographic processes after the 2010 population census without taking the census results into account. The difference between the intercensal change of population size and the natural growth is an indirect characteristic of net migration, as vital records generally have a higher quality.

The difference between net migration according to current accounting and indirect assessment based on population census data can be considered as unregistered net migration. In our calculations we proceed from the assumption that the 2021 census did not have any under- or over-estimations. However, expert demographic assessments show that 20-25% of the population in large cities were avoiding the 2021 Census (Kasyanova, 2021). Furthermore, the extensive use of not-harmonized administrative sources led to extremely large overestimation of population size. The 2021 Census results included information on about nine million people from administrative sources (2.5 times more than in the 2010 Census; Rosstat, 2022c). Andreev and Churilova (2023), based on the proportion of persons with unknown marital status and level of education, argue that administrative sources provide data on only one sixth of the population. Such distortions affect the possibility of indirectly assessing net migration, especially in certain age groups.

The calculations used data on the registered natural and net migration over the 2010–2021 census period by cities and municipal districts as well as municipal regions included among the 20 urban agglomerations of Russia. The boundaries of the agglomerations under study are defined by authors based on the list of municipal entities belonging to them, specified in the text of the draft version of Spatial Development Strategy of the Russian Federation for the period up to the year 2025 submitted for public discussion in August 2018 (O napravlenii proekta Strategii prostranstvennogo razvitija Rossijskoj Federacii, 2018). The bulk of statistics included demographic data on the population size as well as natural and migration balance in municipal entities belonging to 28 regions: three Russian territorial entities (Moscow, Moscow region, and Saint Petersburg) are included in their entirety, while 172 municipal entities belong to other 25 Russian entities. Due to the incomplete data, the calculation did not include closed administrative-territorial formation belonging to Yekaterinburg and Perm agglomerations.

3. Results and discussion

The resident population of 20 urban agglomerations increased from 52.8 to 58.9 million people, or by 11.6%, over the intercensal period (2010–2021), while the population of Russia (excluding Crimea) increased by 1.3% over the period. The pronatalist incentives to encourage births during the period under review did not lead to overcoming the demographic decline in Russia (Cook et al., 2023). The main source of population growth in majority of the largest agglomerations is migration gain.

The assessment of net migration based on the population census data allows drawing a conclusion that almost all urban agglomerations—promising centers of Russia's economic growth—are characterized by the migration-caused population growth. The leaders in the registered positive net migration in 2010–2021 were Moscow, Saint Petersburg, and Krasnodar agglomerations. The 2020–2021 census data mostly confirmed the trends already registered in the current accounting in regions and municipalities belonging to agglomerations.

The indirect estimation based on census data showed the maximum migration growth in the metropolitan areas of Moscow, Saint Petersburg, Krasnodar, and with a distance in Novosibirsk, Tyumen, Kazan, and Krasnoyarsk. The fact is that in these regions, administrative sources were used more broadly than in the others (Andreev & Churilova, 2023). The highest migration growth per thousand residents is in Krasnodar, Tyumen, Saint Petersburg, and Moscow. The only agglomeration with migration decline is Omsk, where both sources identify a migration-induced population decline (Table 1).

Table 1. Components of change in population of Russia's urban agglomerations—promising centers of economic growth in intercensal period (from October 14, 2010 to October 1, 2021)

Agglomeration	Population number as of 2021 Census (October 1, 2021; thousands)	Natural growth (thousands)	Registered net migration (thousands)	Registered net migration, per 100 residents	Indirect assessment of net in-migration (thousands)	Indirect Assessment of Net in-migration, per 100 residents	Difference in net migration assessments in intercensal period (thousands)
Moscow	22,138	−127	1,880	9,1	3,055	14,8	1175
Saint Petersburg	7,119	−86	797	12,1	1,116	16,9	319
Rostov	2,547	−78	121	4,8	142	5,6	21
Samara	2,535	−80	65	2,6	98	3,9	33
Yekaterinburg	2,505	1	133	5,5	178	7,4	45
Novosibirsk	2,176	−5	199	9,6	227	11,0	28
Nizhny Novgorod	2,146	−112	57	2,6	45	2,1	−12
Kazan	1,813	34	136	8,0	207	12,2	71
Chelyabinsk	1,789	−13	76	4,4	98	5,6	22
Krasnodar	1,638	27	226	16,0	434	30,8	208
Volgograd	1,596	−57	26	1,6	53	3,3	27
Ufa	1,586	16	95	6,3	137	9,1	42
Omsk	1,374	−14	−10	-0,8	−9	-0,7	1
Krasnoyarsk	1,353	23	130	10,5	206	16,7	76
Voronezh	1,334	−49	134	10,4	147	11,5	13
Perm	1,228	−1	67	5,6	64	5,4	−3
Kama	1,134	31	−17	-1,5	16	1,4	33
Irkutsk	1,078	17	61	5,9	81	7,8	20
Tyumen	1,024	57	192	21,7	218	24,7	26
Vladivostok	814	−14	29	3,6	36	4,5	7

Note. Data in columns are calculated based on Rosstat (2022a, 2022b, 2022d).

Agglomerations vary in terms of population size deviation from the assessments based on current statistics. The comparison of census results and current statistics data allows making judgments about the quality of population migration registration in urban agglomerations. A comparison of net migration based on censuses data with recorded current statistics revealed a small underestimation (within 5% of the population number) of migration growth in most of the urban agglomerations considered.

The highest discrepancies of net migration rate according to different data sources were noted by the agglomerations of Krasnodar, distantly followed by Krasnoyarsk and the capitals (Moscow and Saint Petersburg). The leader in terms of the absolute value of differences (probably as a result of unrecorded migration) is the Moscow agglomeration, which fully or partially includes the territories of four Russian Federation entities and is the main draw for migrants. Judging by the census data, the population of Volgograd decreased at a slower pace than could be expected based on the current statistics data. The Kama agglomeration municipalities registered population drain combined with natural gain. However, the census recorded an increase in its population, which may also be explained by an underestimation of in-migration over the intercensal period. In Nizhny Novgorod and Perm agglomerations, assessment of net migration showed that net was overestimated as per the registered migration data. While the discrepancy is slight in the Perm agglomeration, the overestimation in Nizhny Novgorod was almost 12,000 people.

The largest discrepancy in the net migration between the two sources of information is typical for the agglomerations of Nizhny Novgorod (overestimation) and Krasnodar (overestimation). The Nizhny Novgorod agglomeration is characterized by the greatest overestimation of the population and net migration in the intercensal period. The agglomeration has a geographical proximity to Moscow, the main draw for migrants in Russia. This factor is conducive to the development of temporary migration forms, living "between two homes", as well as the transition of temporary migration to the permanent one (with migrants still registered at the former place of residence). Long depopulation and economic problems of Nizhny Novgorod Oblast and neighboring regions are responsible for the decrease in appeal and migration potential of the city (Rybakovsky & Tayunova, 2019). The size of population (especially male) aged 25–39 as per the census was several percentage points lower than the expected rate. The group with the maximum differences in numbers according to sources of information are children. The use of administrative sources during the 2021 Census determined that children were underestimated in Nizhny Novgorod and Krasnodar agglomerations. This also may be caused by the fact that births happening in the periphery are registered in the regional center as well as by an unrecorded drain of children who leave together with their parents. As of the census results, persons aged 20–24 exceed in the number in the current statistics due to a large number of higher educational institutions.

Krasnodar agglomeration, located in two Russian Federation territorial entities, is the leader in terms of unregistered net migration rate. Comparing the data from the 2021 Census (2022a) and the Rosstat assessment (2022b), a discrepancy of 12% is observed. The current statistics data registered an increase in the share of young and working-age persons in the agglomeration's population even earlier. The census results revealed that the imbalance was even more pronounced. Just like in the Nizhny Novgorod agglomeration, the most significant deviations toward the increase were seen in the student-age groups. For example, the size of population aged 20–24 as of the census was 1.6 higher than the current

assessment. The attractiveness of Krasnodar and its suburbs for young people may be linked to the educational migration traditional for major regional centers as well as to the high appeal of the southmost Russian million-plus city for the young population.

Krasnodar and its surroundings are one of the traditional migration destinations for senior citizens in Russia (Karachurina & Ivanova, 2019). This fact, along with the movement of elderly parents to their children, may explain a visible increase in population numbers for this age category as of the 2021 Census (Rosstat, 2022a) results. Noteworthy is also the fact that the number of men aged 55 and older in the Krasnodar agglomeration was much overestimated in the current statistics, while the increase in the number of older persons in the census results happened exclusively by virtue of women. This may be explained by the traditional disproportion of life expectancy between the two genders.

4. Conclusion

The assessment of net migration volume based on current statistics data in 2010–2021 and indirect assessment based on the results of the 2021 Census may vary in individual agglomerations. The reasons for this are the shortcomings of censuses conducting, current migration registration, and vital statistics.

The important issue is connected with the inability to cover the entire population with the census that took place during the COVID-19 pandemic. Another problem is the possibility to use the data from local residents' registration centers instead of the census of household members. The abuse of this permission provokes a "double registration count" when the residents are registered based on their actual place of residence and places of registration. The census data were characterized by an undercount of children under 15 years of age. The experts also point to the overestimation of the number of elderly people in current records (Andreev & Churilova, 2023).

One of the reasons for differences is the underestimation of arrivals, especially in agglomerations receiving large flows of migrants. This is also facilitated by the lack of serious penalty for permanent living without official registration. As a rule, the higher migration gain in agglomerations is, the higher is the current Rosstat's assessment of population size coming from outside of census results. This problem manifests itself in a similar fashion in agglomerations that have had migration loss not accounted for in the current statistics.

The identified differences in the volume of net migration between the two sources certainly indicate the unreliability of the data, thus questioning in some urban agglomerations the alignment of the demographic potential with economic development goals. The assessment of the real migration's contribution to the population change in urban agglomerations is also necessary to improve social policy, transport infrastructure development, and social and economic urban management.

Acknowledgements

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