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POPULATION CHANGES AND CHARACTERISTICS OF DEMOGRAPHIC PROCESSES IN TBILISI

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ABSTRACT: At the beginning of the 1990s, as a result of the dissolution of the Soviet Union, an instant termination of economic relations that had existed for dozens of years took place in Georgia. Along with the armed conflicts in the regions of Tskhinvali and Abkhazia it has led to a full-fledged socio-economic and political crisis in Georgia. These unordinary events have had a great influence on the demographic processes at hand in Tbilisi. This article aims to establish the effects of the main socio-economic and cultural factors on population change and demographic processes in post-Soviet Tbilisi and offers prognosis on population change according to low, medium and high estimates for 2015–2030.

KEYWORDS: fertility, migration, Tbilisi, prognosis, population dynamics.

ZMIANY LICZBY LUDNOŚCI I CHARAKTER PROCESÓW DEMOGRAFICZNYCH W TBILISI

ZARYS TREŚCI: Na początku lat 90. XX wieku w Gruzji miało miejsce natychmiastowe zakończenie wieloletnich stosunków gospodarczych ze Związkiem Radzieckim. Dodatkowo konflikty zbrojne w Abchazji i Osetii Północnej doprowadziły do kryzysu społeczno-gospodarczego i politycznego w Gruzji. Wszystkie te wydarzenia miały ogromny wpływ na procesy demograficzne w Tbilisi. Niniejszy artykuł ma na celu ukazanie głównych czynników społeczno-ekonomicznych i kulturowych dotyczących zmian demograficznych i procesów demograficznych w postsowieckiej Tbilisi. Dodatkowo autorzy przedstawili prognozy zmian liczby ludności w latach 2015–2030.

SŁOWA KLUCZOWE: płodność, migracje, Tbilisi, prognoza, dynamika liczby ludności.

5.1. Introduction

Right after the collapse of the Soviet Union newly independent Georgia found itself in a deep socio-economic and political crisis and was involved in armed conflicts in the Abkhazia and the Tskhinvali regions. In consequence of these spontaneous developments, which were characterized by unexpected features and results, one could observe the following effects: a quantitative decrease of the population, a decrease in birth rate, instable marriage figures, a crisis of internal family relations, and a quantitative increase of partners living under the same roof out of marriage. As a result of the economic crisis, the unemployment rate has gone up, poor and marginal groups have appeared, and emigration processes have reached unprecedented levels. The radical developments in the socio-economic field are gradually changing the long-existing normative models and the system of values. An important part of the population is not ready to live independently in a new social environment, which is why they found themselves in a situation of "disadaptation".

Nowhere in the post-Soviet space did the economic collapse reach such a scale and intensity as in Georgia (Salukvadze and Meladze 2014). While in 1990, more than half a million people worked in the industrial sector (Chikava 1997), this number had gone down tenfold a decade later – in other words, Georgia clearly underwent a deindustrialization period (Gachechiladze 2011). As a result, an important part of the population was left unemployed. In 1990, the average monthly inflation in Georgia was 1.7%; in 1992, it was 21.3%, reaching up to 56.3% in 1994 (Archvadze 1997). In 1994, the GDP *per capita* amounted to only 500 US dollars (http://www.unstats.un.org).

The historical process of individualization influences the population's demographic behaviour and strengthens their non-family orientations. This

is particularly true for large cities, as it is principally there that cognitive and behavioural stereotypes are formed, which are then gradually spread to other population groups. Large cities convey all the contemporary tendencies; they concentrate the layers of population whose behaviour better reflects the objective requirements of development (Vishnevsky 1977). In the on-going demographic processes in Tbilisi, the global individualization trend plays an increasingly significant role. If formerly people were often oppressed by their duties in terms of family, religion, etc., they have much more choice in the contemporary society, resulting in a weakening of the role of these duties.

5.2. Dynamics of demographic processes

The demographic composition of Tbilisi experienced important systemic changes in the 1990s, which were first and foremost reflected in a quantitative decrease of the population: between the years 1990–2015, the population of the capital decreased by 13%. Despite the quantitative decrease of Tbilisi's population, its part in proportion to the Georgian population increased by 3.1 points. In 2015, almost a third of the whole Georgian population and more than half (50.8%) of the urban population lived in Tbilisi (Table 1).

Year	Population of Georgia (thousands)	Urban population (thousands)	Population of Tbilisi (thousands)	Part of Tbilisi's population in proportion to the Georgian population (%)	Part of Tbilisi's population in proportion to the urban population (%)
1990	4797.4	2653.0	1248.3	26.0	47.1
1995	4794.2	2568.4	1204.6	25.1	46.9
2000	4435.2	2308.2	1094.0	24.7	47.4
2005	4321.5	2257.5	1071.5	24.8	47.5
2010	4436.4	2350.5	1122.3	25.3	47.7
2015	3729.5	2140.4	1086.9	29.1	50.8

Table 1. Population dynamics in Tbilisi and Georgia, 1990–2015

Source: Geostat.

The dynamics of demographic processes at hand since 1990 in Tbilisi can be conventionally divided into three stages. The first stage is the 1990–1994 period. Despite certain changes in population numbers, this stage was relatively stable (Fig. 1), which can be explained by the powerful migratory flow from other regions of Georgia, itself due to high regional levels of unemployment and lower salaries in regions. Additionally, significant numbers of internally displaced persons (IDPs) from the Tskhinvali region and Abkhazia arrived in Tbilisi. These factors helped balance the relatively large-scale emigration processes that started in 1992. In the same year, the Ministry of Internally Displaced Persons from the Occupied Territories, Accommodation and Refugees of Georgia relocated 40% (92.5 thousand) of the 231.9 thousand IDPs in Tbilisi (Salukvadze, Sichinava and Gogishvili 2013).

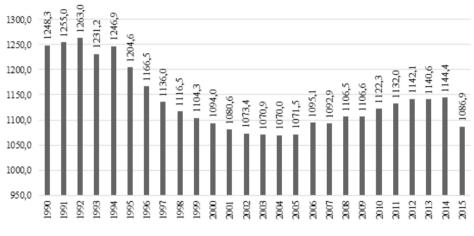


Figure 1. Tbilisi's population dynamics 1990–2015 (1st of January) Source: Geostat.

The second stage covered the years 1994–2004. It was characterized by a permanent decrease in the population: Tbilisi's population decreased by 14.2% in this period.

The third stage started in 2004 and is still going on. Despite some quantitative decreases in certain years, including in 2014, it is mainly characterized by a stable upward tendency. It is worth noting that the period in question has an important (23.6 thousand) increase in population in the years 2005–2006, which is mainly due to the fact that the resolution N4173 taken by the Parliament of Georgia on the 27th of December 2006 attached nearby villages to Tbilisi. According to Geostat data, Tbilisi's population amounted to 1086.9 thousand on the 1st of January 2015, which was 57.5 thousand less than on the same day in 2014¹.

Birth rate has been decreasing in Tbilisi for more than half a century. The crude birth rate in Tbilisi was 20‰ in 1961, but it decreased to 15.8‰ in 2015.

¹ This number (1086.9 thousand) was obtained by adding up the preliminary results of the 2014 national census and the overall increase (natural increase combined with net migration rate) of the last two months of 2014.

The fall of birth rate is a global phenomenon and some of its main causes include the change of the family's role in the society and the devaluation of the children's role in the parents' system of values. The importance of socioeconomic motivations is also lessened, and psychological motivations are brought to the foreground, which leads to fewer offspring. According to data from the 2002 census, among the families with children in Tbilisi, the percentage of families with three or more children was 10.5%, while it was 15.4% in 1989.

As found in official statistical data, the processes at hand in terms of birth rate in Tbilisi are characterized by varying tendencies (Fig. 2). As a result of the significant decrease in birth rate during the years 1990–1995, the crude birth rate decreased by 35% and equalled 10.3‰. The indicator in question was the lowest for the whole period of research (1990–2014), which can primarily be explained by the decrease of birth rate due to the harsh socio-economic situation and by the massive emigration process of the population at their reproductive age.

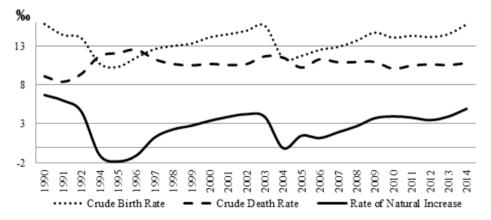


Figure 2. Dynamics of birth, death and natural increase rates in Tbilisi, 1990–2014 Source: developed by the authors according to Geostat data.

After 1995, as a result of a continuing increase of crude birth rate, it reached 15.7‰ in 2003, which is almost equivalent to 1990. These figures raise questions, as it is unlikely that the births in Tbilisi make up 36.4% of the total number of births in Georgia in 2003 (in 1990, Tbilisi's births amounted to 21% of the total number of births in Georgia). One of the reasons for this is that there were deficiencies in the records concerning the natural increase of the population, a fact that was noted several times by various specialists (Meladze, Tsuladze 1997; Meladze 2004; Yeganian, Badurashvili et al. 2001).

The above-mentioned idea is also corroborated by the fact that since 2004, according to the work carried out within the framework of a collaboration between Georgia and the United Kingdom by Geostat, the Ministry of Labour, Health and

Social Affairs of Georgia, and experts, the accounts of births and deaths were directly recorded at medical facilities on a national scale, after which they were compared to the primary data issued by the civil registry authority. As a result of these circumstances, demographic statistics were more reliable for a certain time. In 2004, the crude birth rate amounted to 11.4‰. Since 2009, the indexation of the population's natural increase has been based on information provided by the public registry of the Ministry of Justice.

A significant increase of birth rate can be observed in Tbilisi since 2006. In 2008, crude birth rate was 13.6‰, which is 0.8 points more compared to 2007. In the years 2007–2008, a similar rise could be observed in Georgia as a whole.

This occurrence led a part of the population to thinking that this tendency was due to the positive influence of the famous announcement made by the Patriarch of Georgia Ilia II, who said that starting from 2008, he would baptize the third and following children of each family, and to the successful socio-economic policies adopted by the State. Despite the fact that it is possible that some policy changes and the Patriarch's announcement have had a positive influence on birth rates, it is unlikely that such a sudden increase of birth rate could be attributed exclusively to these factors. One has to look for the reasons behind this phenomenon in the very complex processes at hand in the demographic system.

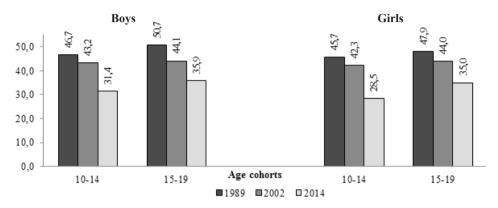
In our opinion, one of the decisive factors behind this birth rate increase are the structural changes that have occurred among women of childbearing age.

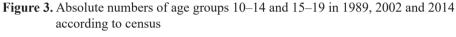
The existence of demographic waves is well known to science (Kvasha 1992). In general, they appear as a result of the existing situation and environmental factors, and throughout their duration, they have a certain impact on a country's demographic system by correcting its parameters. A demographic wave stands for a brief deviation from the general tendency of historical demographic processes. This deviation can be of a positive or a negative nature.

Similarly to the countries that have a high demographic growth, the mothers of most of the babies born in Georgia belong to the 20–24 age group. As we have already mentioned, the birth rate increase in Tbilisi started in 2006. At that time, women aged 20–24 where born in the 1980s, when the birth rate was very high. During the years 1971–1980, 168.6 thousand births were recorded in Tbilisi, while it amounted to 184.8 thousand during the years 1981–1990. One could say that the impact of the demographic wave of the 1980s on birth rate is at its end, and that in the years to come, the birth rate increase will transform into a decrease, as the women aged 20–24 were born in the years 1994–1997, which were low birth rate years.

Tbilisi's crude birth rate was quite stable during 2009–2013. In 2014, it increased to 15.8‰, the highest figure since 1990. This can be explained by Geostat's use of census data, in which the capital's 2014 population was considered lower than in 2013, which resulted in a significant increase of the rate itself.

In the near future, active reproductive age (20–24 years old) will be reached by the generations aged 10–14 and 15–19, whose absolute number is low (Fig. 3). As a consequence, we can expect a decrease in the absolute number of births in Tbilisi in the future.





Source: Geostat.

A noteworthy occurrence in the on-going demographic processes in Tbilisi since the 1990s was the increase of extramarital births, for which Georgia had one of the highest indicators in Europe in that decade – it reached 54.4% in 2006, which was next only to Iceland, Estonia and Sweden (http://demoscope.ru). In Georgia, the relations between a man and a woman are still based on traditional values, which raises questions about the high number of extramarital births. The results of a 1997 sociological study (Tsuladze, Meladze 1998) carried out in Tbilisi on this subject showed that some of the parents who gave birth to children out of wedlock (and especially young parents) were only in religious marriage. The children born in these families are recorded as being born out of wedlock in official statistical data, which provides an incomplete picture of the processes. According to the third article of the constitutional agreement between the Georgian State and the Georgian Apostolic Autocephalous Orthodox Church signed on the 14th of October 2002, "The State recognizes religious marriage carried out by the Church. But for legal matters, it is the data from state-registered marriage that is used" (Sapatriargos Utskebani 2002). As a result of this agreement, the situation did not change. It is also worth noting that in Tbilisi (and more generally in Georgia), the number of children born to a single mother has remained at a stable low. We bring this indicator into focus because it is precisely children born from this category of parents who represent the main source of extramarital births.

In recent years, we could notice a decrease of the percentage of extramarital births, though it was still high (Table 2).

						Among				
	Registered marriages		Extramarital births		According to the declaration of both parents		According to the declaration of mother?		Unknown	
	Year									
	2005	2014	2005	2014	2005	2014	2005	2014	2005	2014
Tbilisi	51.9	66.5	48.1	33.5	41.1	31.1	6.5	2.4	0.5	0.0
Georgia	50.3	69.2	49.7	30.8	42.7	28.5	6.1	2.3	0.9	0.0

Table 2. Extramarital births in 2005 and 2014, in Tbilisi and Georgia

Source: Geostat.

As a natural outcome of global demographic developments, the increase of death rate is a characteristic symptom of the demographic ageing of the population. Crude death rate has significantly increased in Tbilisi during the last 50 years. In the 1960s, the number of deaths per 1,000 people oscillated between seven and eight, while crude death rate amounted to 9.1‰ in 1990, and increased even more in the following years. In the 1990s and 2000s, crude death rate fluctuated (see Graph 2). The highest crude death rate was recorded in 1996, after which it was, again, characterized by a tendency of fluctuation. In 2014, crude birth rate was of 10.8‰.

Since the first half of the 1990s, Tbilisi's population was in its fourth stage of demographic transition, which was characterized by low birth rate and high death rate. Consequently, the natural increase of the population reached its minimum. As a result of the negative processes at hand in birth and death rate dynamics in Tbilisi, some years (1994–1996 and 2004) showed negative natural increase rates (see Graph 2); in the years 2012–2014, it increased, though, it was significantly lower than in 1990.

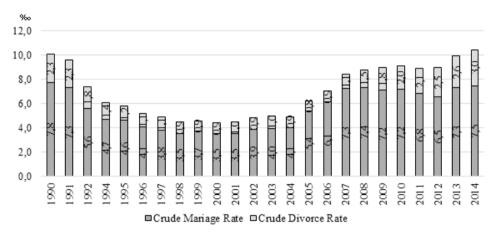
5.3. Changes in marriage and divorce

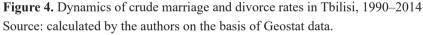
The attitude towards marriage and divorce has always been particularly sensitive in Georgia, which was induced by both established behavioural norms in social environment and the importance of religious morals in partners' relationships. This is precisely why Georgian families distinguish themselves by their stability and low divorce rate (Bekaia, Tsuladze, Gockadze, Meladze 1998).

Until recently the role of a man and a woman were strictly determined in Tbilisi. Men had the dominant role, while the main function of women was to give birth and to look after her family, though this did not mean that women were socially passive. Despite many radical events that happened during the 70 years of the communist rule, which frequently went against the existing values and the system of relationships, family and its inner relations remained mainly traditional, and the division of the statuses and roles between a man and a woman stayed practically the same.

The global processes at hand in today's rapidly changing world have a growing influence on both micro (relations between family members) and macro (relation between state and family) levels. Non-traditional forms of marriage begin to appear, and society is becoming more and more tolerant towards divorce.

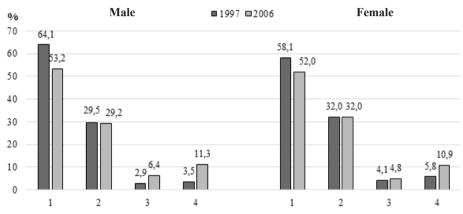
Marriage belongs to the demographic processes that react rapidly to on-going socio-economic changes in the country. Since 1990, crude marriage rate has decreased in Tbilisi (Fig. 4).





Crude marriage rate was very low (3.5‰) in 1998, and remained at a similar level until 2001. Between the years 2001–2008, crude marriage rate increased significantly (by 2.1 times), after which it decreased again, amounting to 6.5‰ in 2012. Most recently, there has been an upward tendency, and it reached 7.5‰ in 2014, which was the highest indicator since 1990.

During the second half of the 1990s, the idea arouse that in parallel to a decrease in the number of marriages, the form of marriage itself was transforming, which means that a portion of the population (and especially the youth) was favouring the form of marriage that was not recorded in official statistics, resulting in a decrease in the number of registered marriages. A study of a sociological research carried out between the years 1997–2006 (Tsuladze, Meladze 1998; Meladze, Badurashvili, Kapanadze 2008) showed that in that period, only the portion of partners who were in registered wedlock had decreased, while the portion of respondents who were either in legal or religious marriage remained practically the same. The number of respondents who were not considered married according to official statistics increased significantly (respondents who were only in religious marriage and were living together without being registered). According to a research of those last years, men and women in this situation amounted to 17.7 and 15.7% respectively in 2006, while these percentages were 6.4 and 9.9% in 1997 (Fig. 5).



1. Only in legal marriage 2. In legal and religious marriage 3. Only in religious marriage 4. Not in marriage

Figure 5. Marital status of respondents in 1997 and 2006 Source: G. Tsuladze, G. Meladze (1998); G. Meladze, I. Badurashvili, E. Kapanadze (2008).

The analysis of the respondents' answers according to their age showed that particularly important changes happened in the group below 25 years of age. Compared to 1997, the number of respondents who lived together without any kind of registration was much higher in 2006.

Regarding divorce tendencies, they were more or less consistent compared to those of marriage. It is worth noting that divorce rates were at their lowest (down to 0.8–0.9‰) in the years 1997–2006 (Fig. 5), which seems inaccurate if we take modern divorce tendencies into account. Divorce rates have not been that low in Tbilisi even in the early 1960s, when there were strict regulations making divorce difficult in Georgia, which resulted in very low divorce rates. In 1965, the law on divorce became more liberal. In the period in question (1997–2006), such low rates of divorce were caused by the fact that because of harsh socio-economic conditions, a substantial part of the population could not afford the price of registering a divorce officially; it was also a way to avoid any barriers. In recent years, along with a relatively enhanced socio-economic situation, the divorce registration process was regulated. In 2014, crude divorce rate in Tbilisi amounted to 3.0‰. It is worth noting that in that year, there were 39 divorces per 100 marriages, which is an unprecedented occurrence.

5.4. Migration trends

Starting with the 1990s, as a result of the difficult socio-economic situation, the destinations chosen by migrants changed radically. The geography of migration expanded greatly, and the age, gender and social structure of migrants changed too.

The "propiska" institution of migration registration², which continued to exist by inertia until 1997, had lost its relevance in the 1990s, which resulted in even worse data availability concerning migrants (Gachechiladze 1997). One could say that in the harsh conditions of a general crisis and of new socio-economic relations, migration statistics practically came to an end.

Despite the fact that the Ministry of Internal Affairs gathers data about border crossing (which is used by Geostat), migration statistics is still problematic because it is impossible to determine the motivation for migration or the country of destination from those records (*National Strategy...* 2011).

As of today, it is impossible to find accurate information about Tbilisi's immigrants and emigrants, which makes official data about outward migration unreliable.

After an approximation of official statistical data we determined that the negative migration balance in the years 1990–2014 should not be less than 300,000.

Because the materials from the 2014 census are still being processed, we can only use the data of the 2002 census. According to the latter, almost a third (29.0%) of the emigrated population of Georgia was from Tbilisi. More than half (52.3%) of the total amount of emigrants was Georgian, 17.4% were Armenian, with significant numbers of Greeks (7.7%) and Russians (6.4%) (Fig. 6).

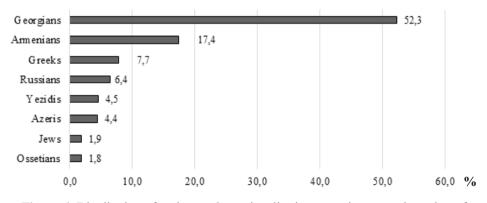
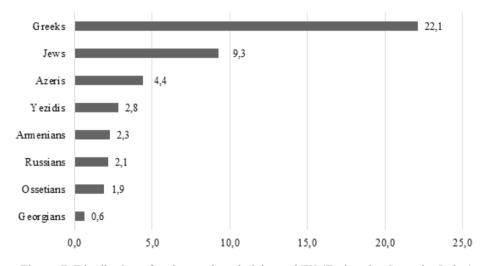


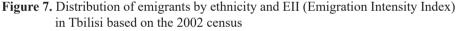
Figure 6. Distribution of emigrants by nationality in proportion to total number of emigrants, 2002
Source: Geostat.

² The obligatory residence permit recording tool in the Soviet Union from the 1930s.

It is worth noting that the classification by percentage does not give a clear picture of the emigration process, and that it would be represented with much more accuracy by a relative emigration index, which would display the share of migrants of a specific nationality in proportion to the total number of individuals of that nationality residing in the country. The higher the index, the greater the emigration intensity is.

This method shows that the most intensive emigrants in Georgia were Greeks, followed by Jews and Azerbaijanis, who also showed high figures (9.3 and 4.4 respectively). The ethnic group that emigrated with the lowest intensity was the Georgian one (Fig. 7).





Source: calculated by the authors on the basis of Geostat data.

As a result of the reduction of the natural increase and intensive emigration processes, ethnic Georgians made up as much as 84.2% of Tbilisi's total population in 2002. Armenians and Russians amounted to 7.6 and 3.0% respectively.

The greatest group of emigrants from Tbilisi are labour migrants. Together with positive aspects, this form of migration also has negative ones. Namely, it became a norm for some families to have spouses living separately for extended periods after one of them had emigrated for work. This phenomenon became so frequent that a new type of family has emerged – the "long-distance family", which is characterized by lower stability and more troubles for the partners in fulfilling their reproductive aspirations. In some cases, long-distance families even appear to be a stimulation factor for divorce.

5.5. Aging population

As a result of the unusual demographic processes currently at hand in Tbilisi, the population's age structure has experienced significant changes. During the period between the censuses of 1989 and 2014, the number of people aged below 15 fell by 4.1 points (Table 3).

Year of		Age Group		Population	Potential	Parent Summert Patie		
census	-15	15–64 65+		 Ageing Index >65/<15*100 	Support Ratio 15–64/>65	Support Ratio >85/50–64*100		
1989	23.2	68.5	8.4	36	8	3		
2002	19.5	70.0	10.5	54	7	3		
2014	19.1	68.9	12.0	63	6	5		

Table 3. Age structure and ageing index of Tbilisi's population

Source: Geostat.

Over the years of independence Tbilisi's population has undergone intense demographic ageing: according to the preliminary results of 2014 census, the part of Tbilisi's population aged 65 or more amounted to 12%.

Tbilisi's population ageing index, which shows how many people aged 65 or more exist *vis-à-vis* each 100 children (aged below 15), was getting higher and higher. In 2014, this figure reached 63.

The potential support ratio decreased steadily. According to censuses, in Tbilisi there were less and less people in their working age (15-64) vis-à-vis each individual aged 65 or more.

The parent support ratio increased. In 2014, for 100 persons aged 50 to 64, there were five persons aged 85 or more. It is also noteworthy that, according to the 1989 and the 2002 censuses, the above-mentioned ratio amounted to 3.

The processes at hand regarding Tbilisi's age-sex structure can be observed in age-sex pyramids of the city's population (Fig. 8). The shape of the 2014 pyramid resembles that of a regular pyramid, with a narrow lower part and a wide upper part.

5.6. Prognoses and conclusions

In the near future, the main components of Tbilisi's demographic evolution will be: a decrease of birth rate, demographic ageing and migratory processes, as a result of which we can expect a significant transformation in the demographic system.

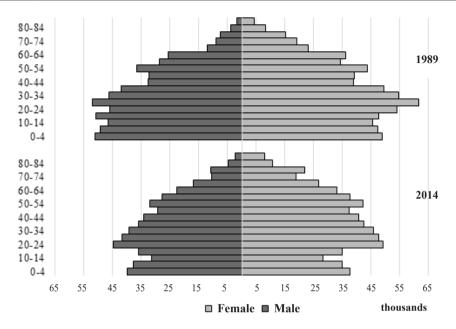


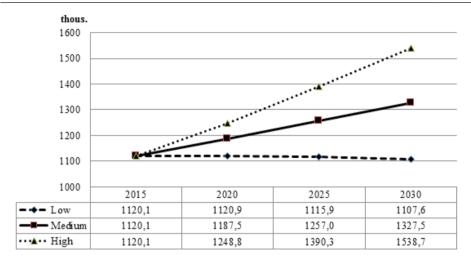
Figure 8. Age-Sex Pyramid of Tbilisi's Population 1989 and 2014 Source: Geostat.

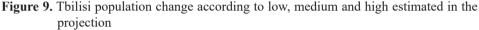
If the demographic processes at hand in Georgia continue, we can expect many changes in the size and the age structure of Tbilisi's population for the 2015–2030 period. We have carried out the following predictive calculations (with the participation of Dr. I. Badurashvili³) in the context of the ongoing (from 2015 to 2017) project "Revision of Land Use Master Plan of Tbilisi" financed by the Tbilisi City Hall.

The calculations of the low, medium and high projection estimates of Tbilisi's population were carried out on the basis of data found in the age-gender structure of the population, which is based on preliminary data from the 2014 Georgian census. For the calculation of the number of births, deaths and migrants, we have used data from the ongoing census of the National Statistics Office of Georgia (Geostat), as well as experts' and our own assessments. For the predictive calculations, we have used the cohort component method (Preston, Heuveline, Guillot 2001).

According to the low estimate, Tbilisi's population will decrease by 12.5 thousand during the years 2015–2030. As for the medium and large estimates, they forecast a population increase by 207.4 and 418.6 thousand respectively (Fig. 9).

³ Dr. I. Badurashvili – Director of the Georgian Centre of Population Research (GCPR).





Source: G. Meladze & I. Badurashvili based on Geostat data.

According to the calculations of these projections, important changes are to be expected for the 2015–2030 period concerning the age structure of the population. Namely, ac=cording to the low estimate, the proportion of children under 15 will decrease, while the proportion of people aged 65 or more will increase (Table 4).

 Table 4. Change in the age structure of Tbilisi's population during the years 2015–2030 according to the low, medium and high estimates in the projection (percentage)

Age	Low estimate			Medium estimate				High estimate				
groups	2015	2020	2025	2030	2015	2020	2025	2030	2015	2020	2025	2030
<15	19.1	19.1	17.6	15.3	19.1	20.1	20.0	19.4	19.1	20.9	21.7	22.3
15–64	68.9	67.9	68.0	68.3	68.9	68.0	68.1	68.2	68.9	68.3	68.3	68.1
>65	12.0	13.0	14.4	16.3	12.0	11.8	11.9	12.3	12.0	10.8	9.9	9.6

Source: G. Meladze & I. Badurashvili based on Geostat data.

According to the medium estimate, the proportion of children under 15 will decrease slightly during the whole period in question, while the high estimate forecasts an increase of this age group's population. Regarding people aged 65 and over, their numbers will slightly increase according to the medium estimate, while the high estimate forecasts a reduction tendency for this age group.

However, the existing and foreseeable trends of population and socio-economic development of Tbilisi gives us sufficient reason to expect that the demographic changes in Tbilisi over the next 15 years will probably evolve according to a model between the low and medium estimates.

Literature

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