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Chapter 1. Introduction

1.1. Problem definition

Fertility is an important variable principally affecting population growth in most contemporary populations. The level of birth rates in a population affects not only its current size, but also has a significant impact on its future growth, as well as the population age structure.

Human fertility has attracted considerable attention over the past half-a-century.[1] (Handbook of Population, 2005). In fact, the largest, coordinated social science research efforts in history (the World Fertility Survey and Demographic Health Surveys) have fertility as their focus. Motivation for this attention emanates from the important and wide-ranging consequences of fertility and fertility change. Fertility levels are key components of population change and have been, historically, the component most difficult to predict (Bongaarts and Bulatao, 2000).

Given the importance of fertility differences and trends and the effort devoted to their study, one should expect substantial scientific progress in this area of demography. Indeed, no social science subfield is more developed than fertility. Of course, not all answers are in hand and disputes exist. However, highly useful analytic and theoretical frameworks have been developed, widely accepted methodologies for collecting and analyzing information have evolved, and significant knowledge has been accumulated (Morgan and Hagewen, 2005).

The most profound demographic change during the last three decades was the dynamic fertility decline in all regions of the world, initially in developed countries and later on followed by developing countries. Kazakhstan also experienced this change. After gaining independence in 1991, Kazakhstan has experienced substantial economic, social, and demographic changes. The collapse and dissolution of the Soviet Union could not pass unnoticed by population development in its former union republics. Kazakhstan population has endured both, dramatic socio-economic changes and a rapid and deep decrease of fertility across all social groups. Between 1991 and 1999 the value of the total fertility rate declined from 2.73 to 1.78 live births per woman during entire reproductive period (15-49 years of age).

Principal economic and political changes that occurred in Kazakhstan during the 1990s had significant influence not only on family life in general, but on population reproduction in particular. Postponement of family formation became a mass phenomenon of that time and even married couples frequently postponed realization of their reproductive intentions. Fertility rates have fallen to unprecedentedly low levels, in particular, between 1993 and 1999 the total fertility rate had dropped and remained below replacement level of 2.1 live births per woman. Less traditional forms of extra-marital unions, especially premarital cohabitations started to appear more frequently, marriages were progressively postponed by many young men and women, and divorces became widespread across the entire society. Rapid diffusion and easy availability of modern contraception

[1] Teachman et al. (1993) report in a 1993 article in Demography, the official journal of the Population Association of America, that of the 1232 articles published in the journal between 1964 and 1991, by far the most common subject are was fertility and contraception, comprising 36% of all published articles.

contributed to a more careful and cautious planning of family formation. Shift towards less traditional and less family-centered values and attitudes has been observed as well.

Recently, since the beginning of the current decade, the political, economic and consequently the socio-demographic situation have been improving in the country. According to the 2009 Census, the second one to take place after gaining sovereignty, the population of the Republic of Kazakhstan amounted to 16.0 million inhabitants (preliminary results), including 8.6 mil. inhabitants living in urban areas, and 7.4 mil. in rural areas. This represents an increase of more than 1.0 mil. inhabitants (by 6.8 %) in comparison with the 1999 census results. The principal factor of this development was the observed increase of fertility. The total fertility rate continuously increased during the entire period 1999-2008 to reach the level of 2.68 children per woman in 2008. This increase mirrored two basic facts, the positive socio-economic development of the country as well as the extent of preceding postponement of parenthood. Stabilization of economy, improvements in living standards and stronger confidence in stability of future developments have been understood as the principal factors of fertility increase during the past decade.

Described population developments have displayed high differentiation over time, space and among different socio-cultural and especially ethnic population groups. Regardless this fact very little attention has been paid to fertility differentiation in the independent Kazakhstan in the demographic literature until now. This thesis aims to provide the background of fertility developments during the 1999-2008 period as well as an in depth analysis of the rural-urban and of the ethnic differentiation of this process and thus to contribute to filling the gap in understanding of the current demographic processes in the country.

1.2. Research goal and objectives

The goal of this thesis is to contribute to better understanding of the recent demographic development of the Republic of Kazakhstan through detailed descriptive analysis of fertility changes observed during the period 1999-2008 with the aim to identify the existing rural-urban as well as ethnic differences. Implementation of the goal involves the following **objectives**:

- To describe and analyze current developments of natality in Kazakhstan and to assess its role in population development of the country;
- To identify changes in overall fertility and its structures by birth-order and age;
- To analyze changes and differentiation of fertility level, parity and age structures of mothers by ethnicity and type of settlement (urban-rural);
- To discuss obtained empirical findings;
- To formulate prospective fertility trends.

1.3. Cognitive and practical relevance of the theme

Description and analysis of fertility is a traditional theme in demographic research. Without detailed cognition of this process we cannot understand population development as a whole. It is true in general as well as in the case of Kazakhstan in particular. Moreover, in the Kazakhstani context, fertility and its outcomes are closely monitored parameters of the country developments at all levels of state administration. Fertility, regardless its relatively poor cognition is a subject of population policy and its measures. To increase their effectiveness, detailed cognition of the process in question is unavoidable.

The scientific novelty of this thesis and its theme is given by the above-mentioned fact that in depth analysis of fertility development in Kazakhstan during the period of its independence is almost completely missing in scientific literature. Several aspects of fertility analysis presented in this work are very probably studied and presented for the first time in the given spatial and historical framework.

1.4. Thesis structure

This thesis is divided into 9 chapters. In the first chapter the problem definition, goals and objectives, cognitive and practical relevance of the theme are introduced. The second chapter is focused on literature review and illustrates the attained level of fertility process cognition in Kazakhstan and abroad. The following chapter is dealing with theoretical and empirical framework by discussing basic concepts and terminology applied further in the thesis and examining the research approach adopted in the work. In this part the main attention is paid to demographic transition theory. It provides an overall view on the movement of societies from high fertility and mortality to a modern society experiencing low fertility and low mortality levels. Research questions and hypotheses as well as the background of the study are introduced in chapter 4. In chapter 5 mainly data availability and quality are discussed and estimated. The introductory and technical part of the thesis is closed by the methodological section where the adopted approach and methods of research including the basic indicators of fertility are specified. The core of the work is represented by the remaining four chapters. The seventh chapter introduces economic and social realia of Kazakhstan and is divided into two parts, the period of deep economic and social crisis and the period of economic prosperity revival. The basic demographic responses to these changes are overviewed in the closing part of the section. In chapter 8 the principal description of natality and fertility changes and their dynamics at the country level is provided by analyzing separately natality and its age structure, and fertility and its age patterns transformation and fertility by birth order. Analysis of differential fertility by the type of settlement and among different ethnic groups in chapter 9 is following the content structure of chapter 8. In the conclusion of the thesis the main findings are recapitulated and discussed.

Chapter 2. Literature overview

Fertility research issues are extensively covered by demographic literature. The theoretical and methodological conclusions and formulations listed in this thesis are based on several works of widely recognized authors. The essential titles shaping the theoretical view on the theme are represented namely by Ron Lesthaeghe's article "Fertility postponement: theories, explanations, and empirical evidence" (Lesthaeghe, 2001); Dirk J. van de Kaa's "Demographic Transitions" (van de Kaa, 2008); A. J. Coale, B. Anderson and E. Harm's monograph "Human fertility in Russia since the Nineteenth Century" (Coale, Anderson and Harm, 1979); "Recent trends in fertility in industrialized countries" (Population Studies, 1958); "Fertility Behaviour in the Context of Development" (United Nations 1987), and "Below replacement level" (Population Bulletin, 2000).

Fertility differences by ethnicity and their explanations can be found in the study of Pyle (2006) explaining the factors that affect fertility in different ethnic groups including both structural and cultural determinants. The literature of Shoen (1997) is potentially more helpful in understanding differential fertility changes that have been studied in Southern Europe and in the USA. These studies, their interpretations and explanations of different factors and changes were very helpful in understanding and explaining variations of fertility between ethnic groups.

Conceptual framework useful for explaining fertility differences between rural and urban residents was taken from R. Andorka as presented in his book "Determinants of fertility in advanced societies" (Andorka, 1978). He has shown that the relationship between fertility behaviour and place of residence is direct and strong.

The existing research literature on fertility in the Republic of Kazakhstan can be divided into foreign, namely American, and domestic. Among the most quoted works one can find V. Agadjanian's "Post Soviet Demographic Paradoxes: Ethnic differences in marriage and fertility in Kazakhstan" (Agadjanian, 1999), collective work of the same author prepared together with P. Dommaraju and J. E. Glick, "Reproduction in Upheaval: Crisis, Ethnicity, and Fertility in Kazakhstan" (Agadjanian, Dommaraju and Glick, 2007), and finally M.Becker and Ai-Gul Seitenova's " Fertility and Marriage in Kazakhstan' transition period: Implication for social security policy" published in 2005.

Kazakstani authors tackle the question of fertility mostly very generally without aspiration to more detailed description of the process and its deeper demographic analysis. Fertility is mostly mentioned in the context of population development *per se* and only very recently the first publication which can be seen as a monograph on fertility appeared in the format of a research report published under the title "Analyze rojdaemosti v Respublike Kazakhstan" (Institut ekonomiky, 2009). G. N. Agybaeyva in her article "Reproduktivnoe povedenie zhenshin Respubliki Kazakhstan" (Agybayeva, 2006) approaches fertility in the context of the reproductive behaviour. Basic inter-ethnic differences in fertility are subject of A.N. Alekseenko interest in his work "Kazakhstanski put modernizacii: etnodemograficheski aspect" (Alekseenko, 2004). The brief sketch on fertility also can be found in the article "Processy urbanizacii v Kazakhstane v postsovetski period i ih demograficheskaya sostavlaushaya" (Zimovina, 2009).

The presented above overview clearly indicates that there is lack of research in the field of fertility in Kazakhstan despite the principal importance of fertility process for population development of the country. The existing analyses dealing with fertility are focused either on particular Central Asian Republics or on cross-country comparisons with other former USSR countries, and only very limited research has been devoted to differences of fertility in rural and urban areas and among ethnic groups.

Chapter 3. Theoretical and empirical framework

3.1 Basic concepts and terminology

Most of definitions and concepts used in this work are based on the multilingual demographic dictionary, its English version (United Nations, 1958). The basic terms and concepts which were used are listed together with short definitions as follows:

Fertility refers to phenomena connected with human reproduction. The **fertility rate** refers to the rate or incidence of births mostly in a female population or its part only.

The term **natality** is sometimes used as synonym of fertility. Natality is mainly represented by the absolute numbers of births and different birth rates. The term birth rate refers to the rate of incidence of births among a general population.

Live birth is complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born (World Health Organization, 2009).

Childlessness may be due to sterility, but like the word infertility includes both physiological infertility and voluntary infertility which is often inaccurately called voluntary sterility.

Natural growth or natural increase is the excess of births over deaths.

Migration is a form of geographical mobility or spatial mobility between one geographical unit and another, generally involving a change of residence from the place of origin or place of departure to the place of destination or place of arrival.

Net migration is the difference between the total number of persons arriving and the total number of leaving; it is also referred to as the balance of migration.

Urban area is defined as an administrative district, which may include settlements with a population of at least 10.000 people, of whom workers, employees and their members accounted for more than two-thirds of the total population;

Urban population – is the population living in urban areas by definition.

Rural area- is defined as settlements with a population at least 50 people.

Rural population - is the population living in rural areas by definition.

Ethnicity - is defined as the fact or state of belonging to a social group that has a common national or cultural tradition (The new Oxford American dictionary, Jewell and Abate 2001).

3.2 Relevant theories and facts

Demographic Transition Theory

There is no single detailed and comprehensive theory or coherent set of theories of reproductive behaviour despite repeated calls for, and efforts to develop them (Burch 1996; Hohn and Mackenson 1982; Mackenson 1982). Instead of it there is a variety of theoretical approaches each emphasizing particular independent variables or sets of variables as being fundamental to fertility decline (Burch 1996). Unfortunately the different approaches are often seen to be in conflict with one another (Burch 1996; Johansson 1993). Major thesis of Burch (1996, 61) is that there is 'a general lack of clarity and precision in theoretical statements on fertility decline' among social demographers.

Some researchers (Andorka 1978; Burch 1996; Johansson 1993; Mackensen 1982; Mason 1992, 1997) argue that no single approach could possibly account for the wide array of variables influencing reproductive decisions and behavior and be applicable in any setting at any given time.
This chapter discusses the most widely recognized theory, the classical demographic transition theory. This theory, based originally on the experience of European countries and their 'New World' colonies, describes the transition of population from traditional reproductive regime where mortality and fertility are relatively high to modern, intensive form of reproduction characterized by low levels of mortality and fertility.

According to Notestein's formulation of the definitive version of the classical theory (Notestein, 1945, 1948, 1950 and 1953) demographic transition is characterized by a number of stages. The first stage, lasting centuries, is one of high mortality, high fertility, minimal population growth and minimal differential fertility. High mortality is the result of low living standards, famines, wars, and infectious diseases while fertility is assumed to be high as a response to high levels of mortality. In peasant societies strong pressures exist on the population to reproduce. Notestein argued that in traditional societies, fertility had to be high as the 'economic organization of relatively self-sufficient agrarian communities turns almost wholly about the family and the perpetuation of the family is the main guarantee of support and elemental security' (Notestein 1953). When death rates are high life is precarious and the individual or personal advancement is limited. This was particularly so for women whose role was as a wife and mother. The situation is perpetuated by the religious doctrines, moral codes, laws, education, community customs, marriage habits, breast feeding customs and family organization within society (Notestein 1945).

The second stage of the transition is initiated when long term mortality declines as a result of the onset of what Notestein (op.cit, 1945) terms 'modernization' – agricultural, industrial and commercial revolutions which bring about rising standards of living, improved nutritional diets and improvements in sanitary and medical knowledge. Fertility rates according to Notestein, however, were slower to be affected by the processes of modernization and this resulted in an increase in the growth rate of the population. He suggested that in pre-transitional society the factors that support high fertility (religious doctrines, moral codes, laws and community customs) are an integral part of that society and as a consequence are slow to change. The decline of fertility however awaited the

gradual obsolescence of age-old social and economic institutions and the emergence of a new ideal in matters of family size (Notestein, 1953).

According to the theory, it is at this stage of the transition, that the socio-economic and spatial differences in fertility begin to emerge as the old ideal and beliefs give way to the new ideal of the small family. Decline in the number of births, according to Notestein, began in the urban upper classes and gradually moved down the social scale and out to the countryside (op.cit, 1953).

In the latter stages of the transition traditional methods of contraception were used to control childbearing. Later, in response to increasing demands and the development and acceptance of more modern and efficient methods of contraception, fertility levels declined substantially to stabilize at a level just above the mortality rate. Population growth slowed and the year to year fluctuations in mortality and fertility were small. For Notestein (op.cit, 1953) the efficient recruitment of life on the basis of low birth-rates and low death-rates meant the transition was virtually complete. In this period of relative equilibrium, differences in fertility decline and may persist or they may be expected to disappear altogether as similar values, attitudes and birth control practices are adopted and become the norm.

The First Demographic Transition (FDT) has started in many developing countries in the middle of the 20th century when this process already ended in developed countries. More developed countries have "completed" the demographic transition: Fertility and mortality are at low levels, and natural increase adds little, if any, population growth. European countries went through this demographic transition over the past 150 years. Many developing countries are in a transition stage, in which mortality and fertility are falling at varying rates, but still are high relative to the levels of Europe and other more developed regions.

In the mid 1960's fertility started to decline again and reached the levels much below that are needed for population replacement because of the numerous important changes in demographic behavior. Hence the term: Second Demographic Transition (SDT) was coined to describe it. The first authors to conclude that a new demographic transition had taken place were Ron Lesthaeghe and Dirk van de Kaa (1986). Many low-fertility Western countries have entered what some describe as a "second demographic transition" in which fertility falls below the replacement level as forces of contemporary life interfere with childbearing. This transition has been linked with greater educational and job opportunities for women, the availability of effective contraception, a shift away from formal marriage, the acceptance of childbearing outside marriage, and the rise of individualism and materialism.

The United Nations classified countries and areas into three categories according to their level of fertility estimated in the period 1950-2000: high, intermediate and low. According to this classification, Kazakhstan is in the list of low fertility countries where TFR ranges from 2.1 and lower. The fertility transition had begun in low fertility developing countries since the beginning of the second half of the twentieth century, followed by a significant decline thereafter. During that period, Kazakhstan experienced fall in TFR to 3.5 in the period 1970-1975, down from a level of 4.4 in the period 1950-1955 and continued to experience a further decline in fertility, reaching 2.1 in the period 1995-2000 (UN, 2001).

An extensive discussion of the general validity and applicability of the demographic transition theory beyond the borders of the European continent can be traced in demographic literature. Some may argue that this theoretical concept built on European experience has no relevance to the experience of developing countries due to their different way of development, socio-economic differences and so on. According to Reher's point of view (Reher, 2004), the current significant declines in vital rates in the developing world have many similarities to the demographic transition of Europe. Reher's view is that the process of transition in Europe has much to teach us about the recent past and present of the demographic transition under way in Africa, America and Asia, and also gives us a plausible blueprint for the future (Reher, 2004).

The demographic transition theory is useful in providing overall picture of fertility decline. The fall of the Soviet Union started an era of unparalleled political and economic reforms given the breadth, depth and speed of the changes. The shift towards democracy and capitalism entailed greater personal freedom of thought, expression and lifestyles. The dismantling of the command economy allowed market competition to flourish, thus improving productivity of the individual as well as the firm. Overall, individual well being should have been enhanced through increased freedom and economic resources. However, in Kazakhstan and many other countries that underwent market reforms, the transition was accompanied by economic crisis, which decreased well being and resulted in material hardship and insecurity. Populations that had never before experienced extreme social risk suddenly found themselves unemployed, unpaid or unable to cope with inflation, while lacking a sufficient safety net and watching the "winners" of the transition achieve unprecedented wealth.

The pathways through which fertility behavior was influenced during this critical time period remain ambiguous and under-specified in much of the literature on the fertility decline in post-communist countries. Frejka (2008) points out this shortcoming and admits the difficulty in separating different forces at work. There is, however, no doubt that these complicated transformations greatly influenced demographic decisions, including whether and when to have a child.

To emphasize the specific pathway of the fertility transition in Kazakhstan, we can say that Kazakhstan is somewhere between the third and the fourth stages of the first demographic transition where sweeping modernization and increasing urbanization are changing the traditional values placed upon fertility and the value of children in rural society and the increasing female employment and other forms of emancipation are lowering the uncritical acceptance of childbearing and motherhood as measures of the status of women. Fertility decline has generally been associated with the rise in the pace of industrialization, urbanization and economic crisis at the end of the 20 century and economic and social growth in the beginning of 21 century. The diffusion of the use of contraception arguably has played an important role in all these changes as well.

Chapter 4. Research questions and hypotheses

4.1 Research questions

Research questions being answered in this thesis follow the goals specified above in section 1.2. Therefore the thesis is going to look mainly for answers to the following:

- What are the recent developments in the overall natality in Kazakhstan?
- What is the position of natality in recent population developments of Kazakhstan?
- What are the recent developments in the fertility and its age patterns in Kazakhstan?
- What are the differences in fertility by parity, age, ethnicity and type of settlement and how these patterns changed during the period of 1999-2008?
- What are the prospects of further development of fertility in Kazakhstan?

4.2 Initial hypotheses

Since gaining independence Kazakhstan faced substantial economic, social, demographic and political tensions in the society. The period from 1990 to 1997 was the period of negative economic growth as the economic arrangements in the former planned economy broke down while new ones took shape. During this period the process of transition of Kazakh society from the centrally planned administrative-command system of political and economic relations to a market system based on private property ownership and competition took place. During this period of socio-economic transformation the economy was in a stage of deep production and financial crisis that had negative effect on all areas of development and required the adoption of rapid and sometimes unpopular reforms. All these acute crises became one of the major factors of significant and rapid decline of fertility in Kazakhstan. It was only from 1998 that Kazakhstan entered the phase of strong and sustained growth. In 1998 the development strategy "Kazakhstan-2030" was adopted. With the adoption of the document began the creative process to achieve long-term goals and development priorities, to build a stable growing economy country. The period from 1999 to 2008 was characterized by the rapid economic growth in the country where reproduction behavior of population improved and the fertility rates rose relatively sharply. In the analyses of dynamics of fertility the following three hypotheses will be tested:

1. Improvement and development of economy of Kazakhstan had a direct influence on fertility rates in the country. Sustained economic growth, increase in family income, possibility of solving the housing problem through mortgage lending, and health improvements led to an increase in the birth rate. All these conditions, favorable for realization of reproductive attitudes, have influenced the sharp increase in fertility.
2. Ethnic differentiation in the reproductive behavior of the population is determined by complex social, economic and cultural traditions, norms and habits. It is expected that birth rates and fertility rates among European groups remain lower than

among Turk ethnic groups which can be explained by particular specificities of socio-demographic structure of these two groups. Ethnicity related intentions to have many or just a few children are to a large extent linked to traditions and customs that have evolved in the distant past, but remained strong over a long period of time and continue to influence the formation of group norms and attitudes towards childbearing.

3. The average age of mother at childbirth has increased both in rural and urban areas. Even though, the majority of young women are getting married at an earlier age in rural areas than young women in urban areas, hence young women in rural areas begin the process of childbearing earlier and have larger number of children, whereas the majority of women in urban areas are busy at work or studying to attain higher or special education. Thus, it can be suggested that fertility varies by age of mother at the first childbearing and this phenomenon is associated with increasing age of women at marriage. It is also connected with the fact that individuals in rural areas are more dependent on their social environment. Manners, habits, traditions, which are predominantly elements of the psychology and the way of life of the older generations, still have a significant influence on shaping attitudes towards childbearing in young generations, especially in rural areas. While in the urban areas family is developing towards greater individualization of its members.

Chapter 5. Data

5.1 Data availability

Population statistics in Kazakhstan are based on Population Census which takes place every ten years (first Census after independence was conducted in 1999, followed by the next one in 2009) as well as on the current registration of demographic events (vital statistics). The framework, concepts and classifications for the compilation of population, fertility and mortality statistics are basically consistent with the international standards recommended by the Conference of European Statisticians (1997 and 2006), UNECE, Eurostat, UNFPA, UNICEF and the Statistics Division of the United Nations Secretariat (UN, 2008).

The main issue of Kazakhstani official statistics is the availability of data. The Statistical Agency of the Republic of Kazakhstan needs to improve dissemination and accessibility of its detailed statistical information to allow comprehensive demographic research, but also for the mass media and the general public. It is necessary to guarantee to all users an equal access to detailed statistical information.

The vital statistics registration system records births and deaths as well as marriages and divorces. Information on births is based on statistical processing of data reported on the second copies of the medical birth certificates prepared by civil registry offices (ZAGS- Zapis ob Actah Grazhdanskogo sostoyania). Registration of live births in civil registry office takes place upon presentation of a "Medical birth certificate". According to the Law of "Nuptiality and Family" registration of a newly born child in ZAGS is obligatory and the report on birth has to be submitted not later than two months after birth. The completion of birth report (Form №102/y-03) is done by head of medical organization, where the child delivery took place or by a professional who is practicing private medical services outside medical organization. Births registration is used in all 16 regions of Kazakhstan. A standard report specifies the following items of information:

Mother's details:

- The forename(s) and surname of mother
- Place of residence and address of mother
- The mother's date of birth
- Nationality of mother

Child's details:

- Date, time and place of birth of infant
- Gender of infant
- The order of birth
- Weight, maturity, and length of infant

This study uses data from Statistical Agency of the Republic of Kazakhstan and cover the years 1999 to 2008. Vital statistics data from demographic yearbooks of Kazakhstan for the years 2005, 2007 and 2009 were used as well. However, population data by various characteristics are not

available in official statistics or in published data sources as in Demographic Yearbook and therefore also unpublished data of Agency of Statistics of the Republic of Kazakhstan had to be employed in answering the research questions.

The Demographic Yearbook presents tables of the main statistical indicators that reflect the demographic processes of Kazakhstan and its regions. The publication contains statistics on administrative-territorial division, changing of the overall size, age and sex composition of the population and its distribution throughout Kazakhstan, about natality and mortality, nuptiality and divorce, and migration. The Demographic Yearbook also presents demographic parameters characterizing reproduction of population of Kazakhstan's regions, total fertility rate, life expectancy at birth.

Absence of data about natality by regions and by ethnic composition limited the possibilities to demonstrate the regional and ethnic differentiation of fertility and reproductive behavior in Kazakhstan.

Reliability of data depends on reliable reporting and recording of births. Vital statistics of births may be deficient in four ways: incomplete registration, late registration, errors of residential allocation and misreporting age of mother or other facts on birth certificate. It is highly desirable that the categories of personal characteristics of infant and mother be identical to those used for collection of census data in order to improve validity of data and fertility indicators derived from these data.

Live birth data are published by:

- Mother's age (in age groups of <20, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50+ and unknown)
- Mother's age and place of residence (urban and rural)
- Mother's age and birth order (from 1 to 5+ and unknown)
- Ethnicity

Due to absence of some data in Demographic Yearbook unpublished data was used with data given in complete ages. As the live birth data by ethnic groups were not included in published data they were taken from unpublished data by main ethnic groups (Kazakhs, Uzbeks, Uighurs, Russians, Germans, Tatars, Ukrainians and others). The group of others and unknown births are excluded from the analyses because of its insignificant influence on the results.

Demographers differ in their definitions of the years to be considered as the childbearing period. Some use interval 15 to 49. Others use the interval 15 to 44, and still others prefer the ages 20-44. The United Nations uses the interval 15 to 49, presumably to encompass the full range of fertility conditions around the world. For the purposes of data analysis in this thesis childbearing period is considered as 15 to 49 years of age.

5.2. Quality of data

Assessment of quality of available population data is not published and can be only intuitively estimated. The survival of the Soviet system of population statistics using its former well developed infrastructure is a particular guarantee of reliability and especially completeness of statistics of births. Existing system of child allowances, which are distributed only to officially registered children, and the real value of them, especially in the territories with higher risk of statistical undercounting, works in direction of increasing quality of statistical data. The more serious problems are with denominator in fertility indicators. Due to mass migratory movement and under registration of migrants, data on population sex and age structure in general are less reliable than necessary for calculations of age specific rates and all derived indicators. Estimation of their impact is, however, very difficult since the detailed results of 2009 population census have not been published yet. However, definitely they can lead to the deviations of particular fertility indicator values at least in units of per cent.

Chapter 6. Methodology

6.1. Adopted approach and methods used

Demographers have developed a variety of methods for measuring fertility. All of them are interrelated. The dynamics and trends of fertility and its differentials can be analyzed in terms of standard demographic methods like:
Crude birth rate (CBR)
Standardized CBR
General fertility rate (GFR)
Standardized GFR
Age specific fertility rates (ASFR)
Total fertility rate (TFR)
Order-specific fertility rates (OSFR)
Parity progression ratio
Indicators of birth timing
These rates are highly interdependent; however each reveals a unique aspect of the childbearing process which makes it valuable.

6.2. Measurement of fertility

Crude birth rate (CBR) is a crude measure of childbearing because the denominator contains a large population not exposed to childbearing: males, children and elderly persons. A major weakness of this measure is that it is not very sensitive to small fertility changes, in fact, it tends to minimize them. It is calculated from the number of live births a given year (or any other time period) divided by the mid-year population, and it is expressed as the number of live births per 1000 people.

$$CBR=B/P*1000$$

where:

B is the total number of live births in a given year;

P is the midyear total population.

The CBR is subject to important limitations for analytic studies. It is affected by variations in the demographic composition of the population, particularly its age and sex composition. The analyses of time trends and of group fertility differences are enhanced by eliminating as completely as possible the effect of differences in the age-sex composition of the populations being compared. This is only partially accomplished by computation of the general fertility rate. Both the CBR and GFR were adjusted (standardized) for the variations in age composition by direct method of standardization. The initial (1999) population was used as a standard population when standardization was adopted in this research.

$$\textbf{Standardized CBR}=\sum f_x \, P_x^{F,\,stand.}/P^{stand.} *1000$$

where:

f_x is the age-specific birth rate at age x in the given real population;

$P_x^{F,\,stand}$ is the number of females in age x in the standard population;

P^{stand} is the total standard population (all ages, both sexes).

General fertility rate (GFR) is the simplest overall age-limited measure, defined as the number of births per 1000 women of childbearing age. It may be represented by:

$$GFR=B/\,P^{F}_{15\text{-}49}*1000$$

where:

$P^{F}_{15\text{-}49}$ is female population in age from 15 to 49 years of age

$$\textbf{Standardized GFR}=\sum f_x \, P_x^{F,\,stand}\,/P^{F,stand}_{15\text{-}49}*1000$$

This formula is similar to the formula of standardized CBR, except that the denominator $P^{F,stand}_{15\text{-}49}$ here is the female population of childbearing age rather than the total population.

Age-specific fertility rate (ASFR) is calculated for specific age groups and is used to identify differences in fertility behavior at different ages or for comparison over time and are also used to calculate the total fertility rate (TFR) or the completed fertility rate (CFR). It is the annual number of live births per year per 1000 women of a specified age. It is calculated as

$$f_x=B_x/P^{F}_{x}*1000$$

where:

B_x is the number of live births to women aged x during a calendar year;

P^{F}_{x} is the midyear number of women at age x.

Age-specific fertility rate by birth order (of the second kind) is defined as the number of births of a given order per a 1000 women of childbearing age. It is calculated for specific age groups and is used to identify fertility orders at different ages. A rate of this type is represented by this formula:

$$f_x(k)=B_x(k)/P^{F}_{x}*1000$$

where:

$B_x(k)$ represents live births of a given order to women in age x;

P^{F}_{x} relates to all women in a particular age group, without regard to the number of children they have already delivered.

Total fertility rate (TFR) is the sum of the age-specific fertility rates from a cross-sectional perspective. It states the average number of children that would be born alive to a woman (or group of women) during her lifetime if she were to pass through her childbearing years conforming to the age-specific fertility rates of a given year. In reality, age-specific rates change and fluctuate from year to year, even if only gradually. Thus, year-to-year fluctuations in the TFR may reflect changes in the timing of births rather than changes in the average number of children women bear. The TFR

is one of the most useful indicators of fertility because it gives the best picture of how many children women are currently having and the computation is done on a 'per woman' basis:

$$TFR=\sum(B_x/ P^F_x)$$

Total fertility rates by birth order. The age–order-specific fertility rates may be summed over the childbearing age range to give total fertility rates by birth order. The calculation may be carried out on either a period basis or cohort basis. If TFR_k is the total fertility rate for birth order k,

$$TFR(k) =\sum f_x(k)$$

where:

TFR(k) represents the average number of births of the order k,
where k=1, 2,…, n.

Parity progression ratio is the probability a_k of moving from parity *k* to parity *k+1 where*

$$a_0 =TFR(1)$$

and

$$a_k =TFR(k+1)/TFR(k)$$

The mean age at childbearing is the mean age of mothers at the birth of their children if women were subject throughout their lives to the age-specific fertility rates observed in a given year. It is the weighted average of ages at birth, the weights being the ASFRs (f_x) at each age. It is calculated as:

$$\bar{x}=\sum(x+0,5)f_x/\sum f_x$$

Mean age at first childbirth is the mean age of mothers at the birth of the first child. It is obtained from age specific fertility rates derived from information on first births only according to the formula

$$\bar{x}^{(1)}=\sum(x+0,5)f_x^{(1)}/\sum f_x^{(1)}$$

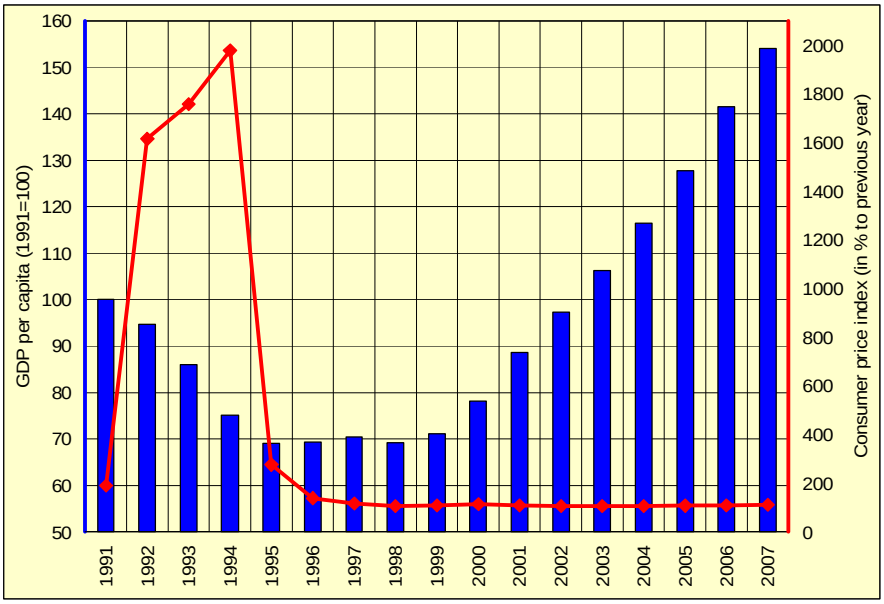
Chapter 7. Social and economic development of independent Kazakhstan

7.1 Economic and social crisis of the 1990's

Kazakhstan gained independence on the eve of the deep economic and social crisis. In the early 1990s Kazakhstan entered a stage of social disintegration and the collapse of the former social structures. Major determinant of negative trends in the development of social structures in the post-Soviet period was the economic factor, especially the decline in production in 1991-1996, unemployment, crisis of values in the period of modernization and the decline of the social security system. Consequently, by the mid 1990s the negative trends shaping the social structure due to decline in the social sphere became widespread; rising unemployment, high levels of social and economic polarization and differentiation, declining social mobility, contributed to dramatically increased emigration from Kazakhstan and strengthening migration flows from rural to urban areas.

The dynamics of the Gross domestic product (GDP) per capita indicator gives a general picture of the difficulties faced by Kazakhstan in the initial stages of transition during the first decade of independence. This important macroeconomic indicator, characterizing the overall economic performance of the country decreased sharply during the first half of the1990s.

Fig. 1 –Gross domestic product and consumer price index developments, 1991-2007



Source: author's calculations based on data from the Agency of Statistics of Kazakhstan

At that time, Kazakhstan had no opportunity to pursue an independent monetary policy, having a unified monetary system with the other states of the former USSR and the lack of monetary instruments significantly limited the ability to achieve macroeconomic stabilization.

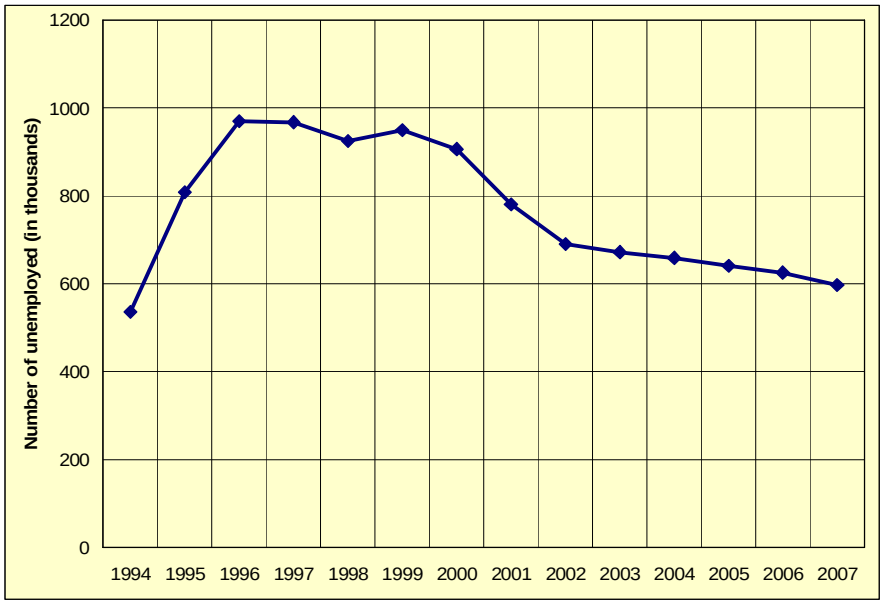
The declining trend of GDP emerged in 1991. During 1990-1994, industrial output in Kazakhstan fell by half (Fig.1). In agriculture, the decline amounted to almost one third, transportation in general fell by two thirds. Closure of the Soviet industrial giants contributed to rampant unemployment and the start of mass economic migration. There was shortage of financial funds in all areas of Kazakhstan. Non-payment of pensions, allowances and salaries reached chronic character. The main thrust of economic reforms was liberalization of economic relations, change of ownership through privatization, development of enterprises, and the wide attraction of foreign investments. Stabilization of the financial system was achieved through the tightening of monetary policy and the introduction of the national currency – tenge in November 1993.

The level of GDP reached the lowest mark in 1995, when it reached only 61.4 % of the 1990 level. The measures adopted by the government to reduce inflation and to accelerate privatization of state owned enterprises, created a favorable investment climate and helped to overcome the negative trend of decline in the GDP growth. In 1996, for the first time after the five years of economic reform, actual year-on-year GDP growth was achieved. In 1997 this trend became stronger, the GDP volume in comparison with 1996 increased by 1.7 per cent. The 1998 Asian and especially the Russian monetary and financial crises displayed negative impact on the economic development of Kazakhstan and led to a fall in the GDP output. As a result the volume of GDP fell by 1.9 % in 1998 compared to 1997.

Another indicator illustrating the scale of socio-economic difficulties faced by Kazakhstan over the last decade is inflation. The early 1990s saw an unprecedented jump in prices, with inflation rising annually (Fig.1). Implemented repeal of price controls in 1992 along with many other factors led to a spike in price level. In 1992, annual inflation amounted to 3061%, in 1993 to 2265% and in 1994 to 1258%. This strong inflation was accelerated after the introduction of Russia's new rubles in July 1993. Moreover, Kazakhstan, in the literal sense of the word was "pushed out" from the ruble zone, which led to the fact that in November 1993 the Republic of Kazakhstan introduced its new national currency, and from this point in time was started the path of an independent economic development. Inflation reached unprecedented heights of about 58 % per month during 1994. Under these circumstances, the Government took principal decisions to stabilize economic and social situation. First, the governmental statement on economic policy, which declared a strict credit policy, was adopted. As a result of the strict anti-crisis measures macroeconomic situation in the country improved significantly during 1995. Finally, the macroeconomic situation stabilized in 1997, when the rate of inflation decreased from 28.7 % in 1996 to 11.2 % in 1997.

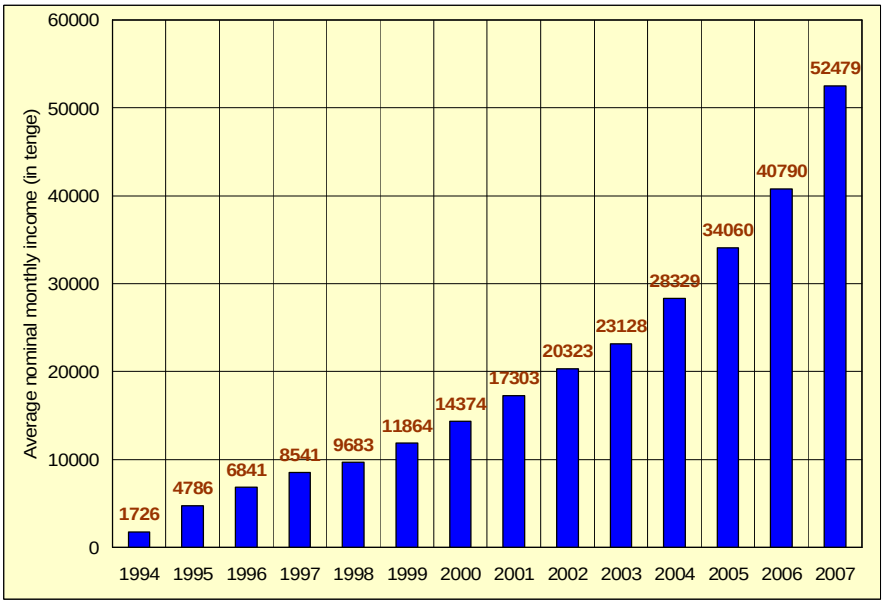
The structural transformation of the economy led to bankruptcy and shutdown of many enterprises, uncompetitive in the market economy. This, in turn, led to a high rise in unemployment. The number of officially registered unemployed persons increased from 536.4 thousand in 1994 to 970.6 thousand in 1996 (Fig.2).

Fig. 2 – Unemployed population, 1994-2007



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 3 - Average monthly salary, 1994-2007



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Alongside unemployment, very low combined incomes of the population could be observed during the period of economic and social crises. Despite the fact that the dynamics of average nominal monthly income showed an increasing trend, it remained at a relatively low level during the entire first decade of independence (Fig.3). Low rates of pensions and other social payments, low wage rates, long delays in payment of wages, pensions and social allowances as well as high prices on public utilities and medical services, all of these can be combined into one heading - that of low real income.

The market-based distribution of cash incomes among the population resulted in a new, radical stratification and material polarization of society. As a result of state budget shortfalls, civil servants and pensioners found themselves in a difficult situation.

Economic and social difficulties of Kazakhstan during its first years of independence originated first of all in the fact that the economy of Kazakhstan was part of the Soviet centrally planned economic system with strong territorial ties with the rest of the country. As part of the former Soviet Union, Kazakhstan achieved relatively high level of specialization and low level of self-sufficiency. Many industrial cycles, especially those of the heavy industry ones, were part of the country wide networks and a big part of production corresponded with the needs of the entire Soviet economic system and partially with the needs of the member states of the COMECON (the Council for Mutual Economic Assistance), which existence ended in the early 1990´s. Kazakhstan was known mainly as a supplier of mineral and agricultural raw materials and primary processed by-products of these raw materials. The Kazakhstani light, food and processing industries were uncompetitive and oriented solely towards domestic internal consumption. It is, therefore, clear, how ill prepared the centrally planned economy of Kazakhstan was to new market conditions, and how it was doomed to large-scale economic problems. It is obvious today that the market economic reforms conducted in Kazakhstan in the 1990s were vitally important. There is no doubt that retaining administrative-command or centrally planned economic system could have caused even deeper crisis. Although Kazakhstan needed the market reforms, we must realize that reforms were bound to carry a high social cost.

By the end of 1996-early 1997 the stabilization of the economic system began and the rate of industrial production decline had significantly decreased. Since 1997, Kazakhstan began to implement the long-term development strategy “Kazakhstan 2030”. This conceptual programme of strategic and tactical nature, clearly identified the country's priorities, ways and methods to achieve them. Global and domestic problems will, of course, require some adjustments. However, the basic recipe is clear: economic growth is impossible without development of reasonably regulated open market, favorable climate for foreign and domestic investment. Since 1998, the country began its long-term reforms of the pension system, public service, justice, education and health care system. Consequently after the three years (1997-2000) of considerable changes and reforms, Kazakhstan entered a new phase of economic development. The increased GDP demonstrated that the country had to a large extent overcome the economic crisis and achieved strong economic growth.

7.2 Rapid economic growth and social changes after the year 2000

At the beginning of 2000, Kazakhstan's economy was in better shape than in the previous years. Kazakhstan was been able to achieve great success in stabilizing the economic situation. The monetary system was able to make sustainable progress in the direction of free market system. The liberalization of the market for goods also gained a lot of ground. Few prices still remain under the control of the state and the country was able to open up its borders to increased trade with other countries. In addition to the fact that the domestic and international value of the tenge was stabilized, great success could also be observed in utilizing instruments of monetary policy and in the regulations of banks.

The financial system of Kazakhstan is recognized as one of the most progressive ones. Kazakhstan was the first among the CIS countries to create the National Fund on the 23 of August in 2000 for sustained socio-economic development, accumulation of financial resources for future generations which is known as savings function, and to reduce dependence on negative external factors known as a stabilization function.

At the beginning of the XXI century Kazakhstan reached a new stage of development. The long-term priorities of the Strategy "Kazakhstan 2030" formed the basis for the government policy of Kazakhstan, forming a clear set of strategic direction and goals. Priorities identified in this Strategy are implemented within individual direction, but all of them are connected into a single mechanism of social change. In the late 1990's and early 2000-ies such priority was the economy. The task of delivering successful economic reform was the mainstay and foundation of the Strategy "Kazakhstan 2030".

The main source of the economic growth was the exploitation of raw materials capacity. About 30 billion of U.S. dollars of foreign direct investment were attracted to the Republic's economy. Investors know that Kazakhstan - a reliable partner which guarantees stability and ensures mutually beneficial cooperation. Large investments were made in oil, gas and mineral extraction sectors by many large foreign companies alongside with cooperation with the domestic companies. These companies' intensive activity undoubtedly had a positive effect on the social and economic situation in the country, creating new jobs, improving infrastructure, and filling the deficit of budget by taxes and other payments. Starting from the early 2000s Kazakhstan's economy has been growing rapidly, improving the welfare of its population, rising levels of domestic savings. The economy has acquired a qualitatively new model of development based on a limited State intervention in the economy with the active role of the private sector and promising competition.

The widespread decline in the real sector of the economy which lasted from 1990 to 1996 was most prominent in the industrial sectors. The increasing dynamics of the GDP growth shows that with economic reform it became possible to stop the process of economic contraction, and in combination with the near-complete institutional transformation, it was possible to move to a new stage of economic reform: the revitalization of economic activity (Fig.1). The positive shifts in the economy were connected to substantial growth of volumes of exports, rapid increase in investments and industrial production. These changes became apparent already in 2000. During the following years, the economic situation continued to improve at a very fast pace. The GDP per capita in dollar

terms at the official rate increased from 1229.0 in 2000 to 6 771.6 dollars in 2007. Between 2001 and 2007 the average annual rate of growth of the GDP amounted to 10.6%. Alongside clear improvements in the economy the level of prices was characterized by moderate rate of increase or decrease during the last decade (Fig.1).

Despite the economic recovery in recent years, unemployment still persisted in the country. However, even if the near-full employment has not been achieved, the number of unemployed people started to decrease already in 2000 and was lower compared to previous years (Fig.2). New investments, opening of new companies, reestablishment or expansion of existing companies which experienced hard times during the 1990, considerably influenced the number of unemployed people which started to decrease as the new opportunities to get a job increased in the country. By 2007, the number of unemployed people decreased to 597,200 from 906,400 in 2000.

The situation with income is characterized by stable growth in average monthly wages (Fig.3). The pace of annual growth in incomes between 2003 and 2007 was in the range of 14-28 %. In 2007 average income per employee was 52,479 tenge, demonstrating an increase of 28.7 % compared with 2006 This shift was facilitated by high rates of economic growth and the social dimension of state policy, the main elements of which remain phased increase in wages and minimum social guarantees. Minimal value of wages in 2007 amounted to 9,752 tenge.

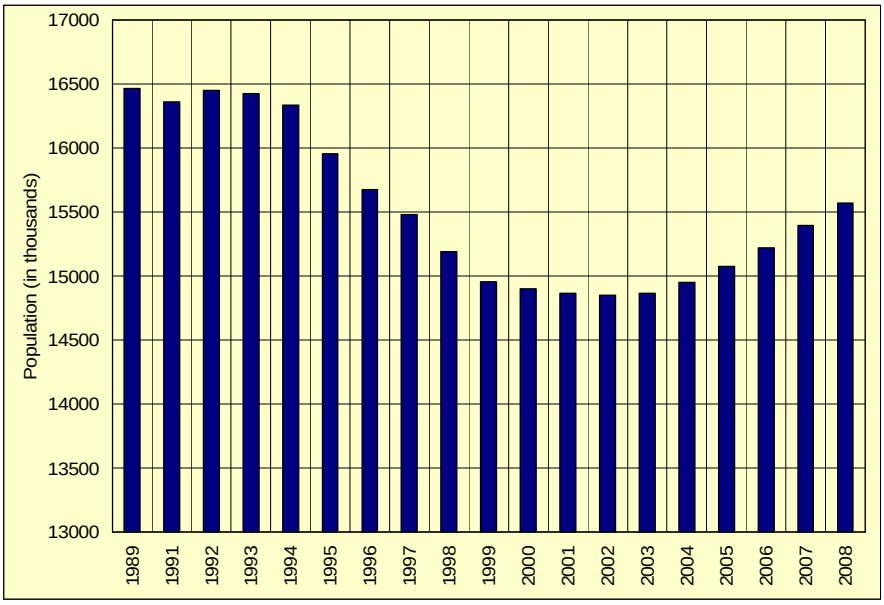
Over the past 10 years, Kazakhstan achieved fast economic growth, internal political stability and consolidation of society, crafted a competent national policy, and taken an important step towards an open, balanced democratic political system and achieved recognition in the wider global community.

7.3. Demographic response to economic and social changes

It is obvious, that all above mentioned factors to some extent influenced the population development. The collapse of the former USSR, the acquisition of sovereignty, difficult socio-economic problems led to a reduction of Kazakhstan population (Alekseenko, 2004). The population of Kazakhstan decreased in 1999 compared with 1991 by 1.4 million, and amounted to less than 15.0 million inhabitants.

A trend of overall population decline began in 1992, when the losses in population from migration exceeded gains from natural population change.

Fig. 4 - Total population, 1989-2008

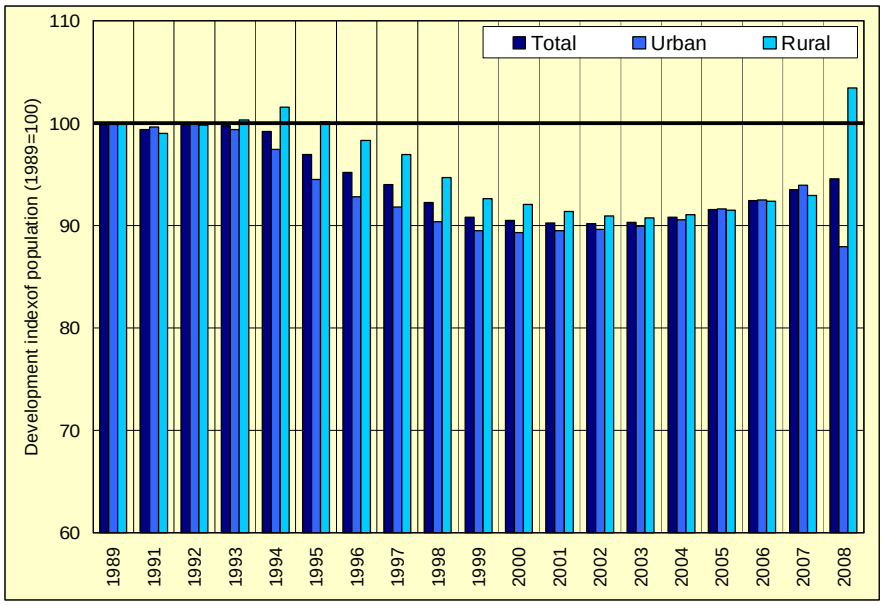


Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

The decrease of Kazakhstan population during the 1990's was caused mainly by the emigration from Kazakhstan, declining fertility rates and increasing mortality rates. In 10 year from 1989 to 1999 population of the country dropped almost by 9%, while urban population decreased by 10% and rural population by 7% which is clearly characterized by development index. From 2005 the trend in an opposite direction started to emerge. The sharp increase in the number of rural population by 10% and decrease in urban population by 6% can be explained mainly by the amendments and additions to the Law of administrative-territorial structure of the Republic of Kazakhstan introduced on 4th of June in 2006. Many formerly urban settlements of the smallest size were assigned to the category of rural areas. The redefinition of urban-rural settlements contributed to increase in the number of population in rural areas and consequently decrease in urban areas.

Ten years of independent development of the Republic of Kazakhstan was marked by significant changes in the social and demographic structure of the population. In turn, these changes in the socio-demographic processes were due to radical changes of the entire social system, the processes of modernization of society and economy.

Fig. 5 - Total population by type of settlement, 1989-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Socio-economic development crises of the Republic of Kazakhstan in the 1990´s adversely affected the demographic situation. During the 1990's Kazakhstan was experiencing growth of mortality when only during the first five years after the collapse of the Soviet Union the life expectancy at birth dropped from 62.6 years in 1991 to 58.0 years in 1995 for males and from 72.4 years to 69.4 years for females. This decrease in life expectancy at birth was connected with deterioration of living standards and health care system. Reduction in the quality of medical services, high cost of medicines and medical treatment, changing attitudes of individuals and the state towards health care and worsening of environmental situation in many regions of the country all together contributed to the increasing mortality. Alongside with the increasing death rates rapid decrease of natality was observed during the years in question. Thus, between 1991 and 1999, the annual number of newborn infants fell from 353.2 thousand to 217.6 thousand. As a result, the number of births decreased from 21.5 to 14.6 per 1000 inhabitants. Such a sharp decrease in the birth rate has not been observed in Kazakhstan since World War II.

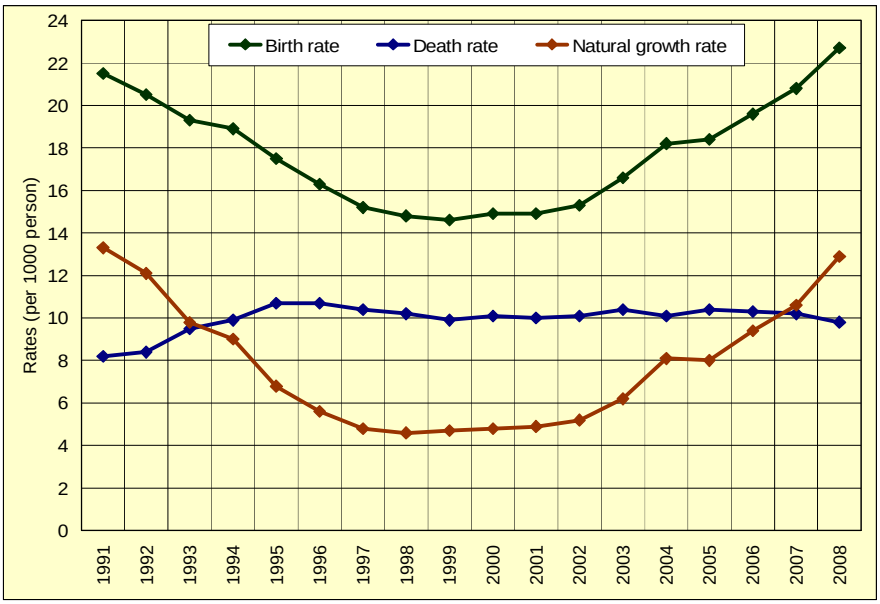
Increase of mortality and decrease of natality resulted in deep reduction of natural population growth. It remained positive during the entire period, however decreased from 13.3 persons per 1000 inhabitants in 1991 to its lowest value of 4.6 persons per 1000 inhabitants in 1998.

With the decreasing trend of birth rate among the population of the Republic of Kazakhstan the government was forced to take steps to normalize the situation, and on August 17, 2000 had adopted the Resolution No 1272 "The Concept of the State Population Policy of the Republic of Kazakhstan". This conceptual program based on the basic principles, priorities and problems of demographic development of the Republic of Kazakhstan consists of a set of political, administrative, economic and socio-psychological measures, aimed to stimulate population growth.

Alongside with the conceptual program adopted in 2000 at the national level, the "Program of demographic development of the Republic of Kazakhstan for the period 2001-2005" was adopted in 2001 emphasizing the goal to increase fertility. All these government actions have more or less

influenced the improvements of the demographic situation in the country. Economic and social situation in the country substantially improved during the 2000´s and demographic developments reflected this. After reaching in 1999 the lowest rate for the first time in the history of Kazakhstan of 14.6 births per 1000 population, birth rates started to increase. Since 2002, Kazakhstan has been experiencing an increase in birth rates reaching the level of 22.7 births per 1000 inhabitants in 2008. In 2007 the level of life expectancy at birth reached 60.7 years for males and 72.6 years for females compared to 1995 when it was 58.0 years for males and 69.4 years for females. The dynamics of death rates show a steadily decreasing trend, but still remain at comparatively high level, which means that the country still needs to improve social conditions and health care system to support and improve all demographic processes in the country.

Fig. 6 - Trends in rates of birth, death and natural increase 1991-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

According to Zimovina's point of view (Zimovina, 2009), the growth of birth rate in Kazakhstan is connected to several factors such as:

- Numerous generations born in the 1980's have reached the reproductive age;
- Secondly, improvement in the socio-economic conditions led to the realization of so-called "delayed birth".
- Orientation of young families towards reducing the intervals between births, especially between the first and the second child.

Changes in mortality and natality substantially influenced population development of Kazakhstan during the past two decades. The major changes in the population size, structure and spatial distribution, however, caused the third, remaining component – migration, both external and consequently also internal ones. In 1991 the country stood in many respects at the edge of the abyss and like the other newly independent states, inheriting the Soviet past. An important component of this "past" was also the ethnic structure of population. European-born population historically was in the majority in Kazakhstan, however, ethnic composition of the Republic changed significantly

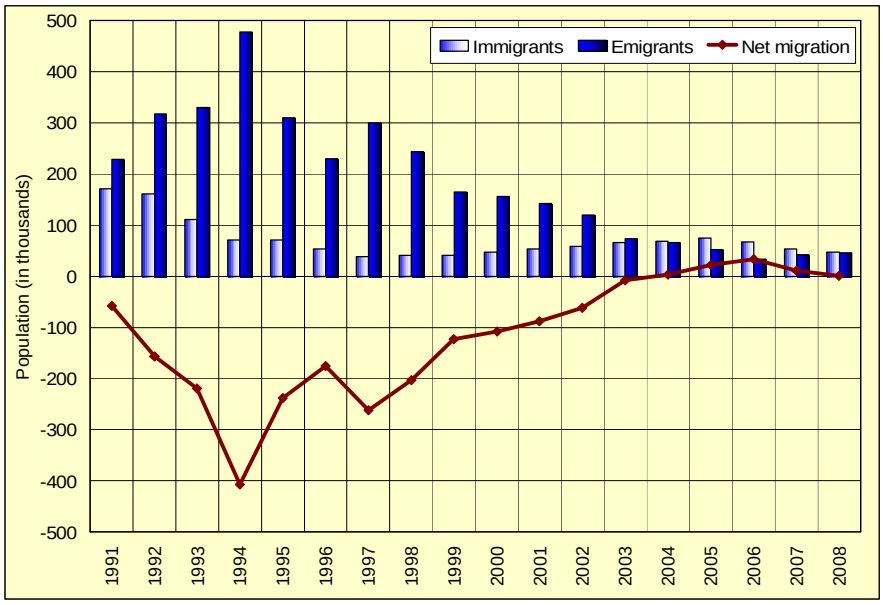
between 1991 and 1999 when the migration processes accelerated like in many other countries of the former Soviet Union. Economic hardship (especially in the early years of reforms) stimulated emigration attitudes among the population, in particular among the ethnic groups which had possibility to return to their historical homelands offering higher standards of living. Due to mass emigration, namely during the 1990´s a significant reduction in the number and proportions of population of European origin occurred (Tab.1).

Tab. 1 - Ethnic composition of population, 1989, 1999 and 2008

	Absolute numbers in thousands			**Proportions in percentage**		
	1989	1999	2008	1989	1999	2008
Kazakhs	6497.0	7985.0	9315.7	40.1	53.4	59.8
Russians	6062.0	4479.6	3905.6	37.4	30.0	25.1
Ukrainians	875.7	547.1	431.2	5.4	3.7	2.8
Uzbeks	331.0	370.7	450.9	2.0	2.5	2.9
Germans	946.9	353.4	221.4	5.8	2.4	1.4
Tatars	320.7	249.0	227.5	2.0	1.7	1.5
Uighurs	181.5	210.3	237.3	1.1	1.4	1.5
Belarusians	177.9	111.9	88.8	1.1	0.7	0.6
Koreans	100.7	99.7	103.2	0.6	0.7	0.7
Azerbaijans	89.0	78.3	91.7	0.5	0.5	0.6
Turks	49.5	78.7	87.7	0.3	0.5	0.6
Other ethnic groups	567.4	389.4	410.5	3.5	2.6	2.6
Total	**16199.2**	**14953.1**	**15571.5**	**100.0**	**100.0**	**100.0**

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 7 - External migration, 1991-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

The period from 1991 to 2004 was characterized by the negative net migration (Fig.7). "Peak" negative balance of external migration took place in 1994 when about a half of million people left the country and a little over 70 thousand people entered, mostly ethnic Kazakhs (repatriants) from neighboring countries. The lowest immigration was registered in 1997 with 38 thousand people and the negative net migration trend continued till 2004. However, already from the beginning of this decade when the situation has stabilized in the country, the number of people leaving the country started to decrease while the number of immigrants started to increase and consequently, negative surplus value of migration was decreasing also. In 2004 the number of immigrants exceeded the number of emigrants and as a result the net migration positive value of about 2.8 thousand inhabitants was recorded for the first time since 1991. The following years were characterized by the increasing number of immigrants which resulted in positive net migration.

Chapter 8. Fertility and its dynamics

Over the years of independence, systemic economic and political reforms have been carried out in Kazakhstan. The scale of changes in economy and social life of the country over last ten years can be labeled as principal. The positive economic and social changes supported the rapid fertility growth observed during this period.

8.1 Natality and changing age structure of females in reproductive age

Natality decreased from 353.2 thousand live births in 1991 to 215.1 thousand live births in 1999 and so declined by 138.1 thousand births within the first nine years of independent Kazakhstan. However, the decrease occurred in previous decade was compensated by increase observed during the following nine years, between 2000 and 2008. The number of children born increased from 215.1 thousand (1999) to 356.5 thousand registered by official statistics in 2008 (Tab.2).

Tab. 2 – Live births by birth order, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	215,092	221,505	219,447	226,695	247,537	272,180	278,287	301,233	321,530	356,464
1st order	95,084	97,388	97,483	98,484	108,794	117,180	120,693	128,452	139,494	157,850
2nd order	63,030	64,957	63,082	66,655	72,111	79,354	81,208	87,398	90,999	98,487
3rd order	31,854	33,331	32,700	34,737	38,297	43,912	44,644	48,786	51,597	55,986
4th order	15,247	16,322	17,187	17,444	18,312	20,242	20,736	24,216	25,915	28,382
5th and higher	9,877	9,507	8,995	9,375	10,023	11,492	11,006	12,381	13,525	15,759
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	44.2	44.0	44.4	43.4	44.0	43.1	43.4	42.6	43.4	44.3
2nd order	29.3	29.3	28.7	29.4	29.1	29.2	29.2	29.0	28.3	27.6
3rd order	14.8	15.0	14.9	15.3	15.5	16.1	16.0	16.2	16.0	15.7
4th order	7.1	7.4	7.8	7.7	7.4	7.4	7.5	8.0	8.1	8.0
5th and higher	4.6	4.3	4.1	4.1	4.0	4.2	4.0	4.1	4.2	4.4
Development index (1999=100)										
All births	100.0	103.0	102.0	105.4	115.1	126.5	129.4	140.0	149.5	165.7
1st order	100.0	102.4	102.5	103.6	114.4	123.2	126.9	135.1	146.7	166.0
2nd order	100.0	103.1	100.1	105.8	114.4	125.9	128.8	138.7	144.4	156.3
3rd order	100.0	104.6	102.7	109.1	120.2	137.9	140.2	153.2	162.0	175.8
4th order	100.0	107.1	112.7	114.4	120.1	132.8	136.0	158.8	170.0	186.1
5th and higher	100.0	96.3	91.1	94.9	101.5	116.4	111.4	125.4	136.9	159.6

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

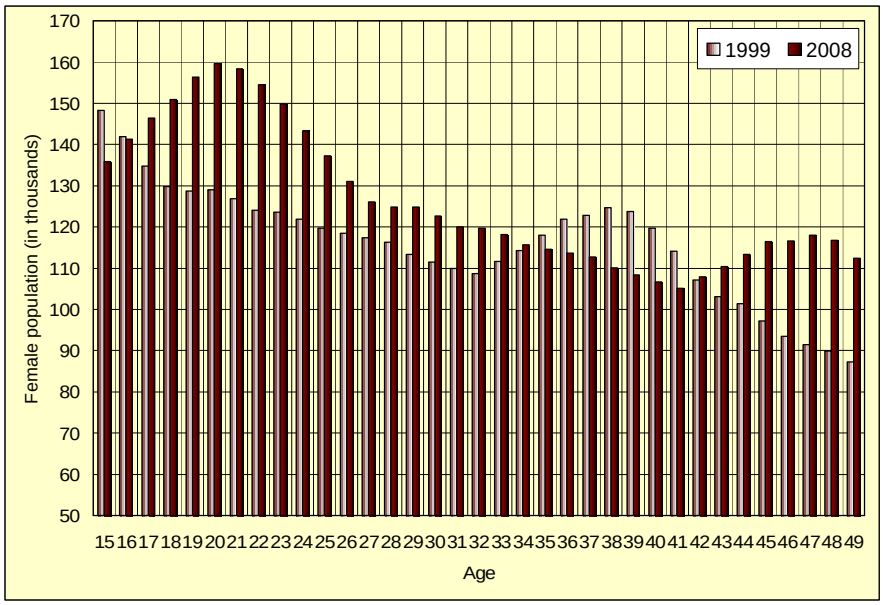
Note: Unknown births are excluded

Not only the scale but also the dynamics of changes observed during the upward and downward phases of described development were rather similar. Between 1999 and 2002, the increase of live born children total numbers was moderate. Since the year 2003 one can however observe intensive growth. Within six years, between 2003 and 2008, the development index characterizing this dynamics was growing annually by about ten points (for ten percent points in relation to the number of children born in the year 1999). As a result the number of children born in 2008 was about two-third higher than the number of those born in 1999. This increase closely correlates with socio-economic development of the country, with progress in social sphere, growing economic stability and increase of inhabitant's confidence in the future in particular. Particular role, however, played also realization of accumulated reproductive potential related to massive postponement of maternity during the 1990´s.

Observing numbers of births by birth order and their change over time, it can be stated that the increase of natality is quite proportionally distributed over particular orders. As a result, the relative structure of newly born children by their order has changed insignificantly since 1999. The first order children have represented about 43-44 % of newly born children, the second order - 28-29 %, the third, fourth and fifth or higher birth order children proportions are 15-16 %, 7-8 % and about 4 % respectively.

More sensitive regarding natality differentiation by birth order seems to be the development index. Its values have grown till now most dynamically in the case of the third and fourth orders. It would be a standard situation if the proportion of females in higher reproductive age, above 30 years, would grow. The age structure of females, however, displayed the opposite tendency: the absolute number of potential mothers between 18 and 25 years, at the age of lower order childbearing, has grown most visibly whereas the absolute number of women between 30 and 40 years of age decreased (Fig.8). This clearly signals principal changes in fertility patterns and levels in Kazakhstan during the period of observation.

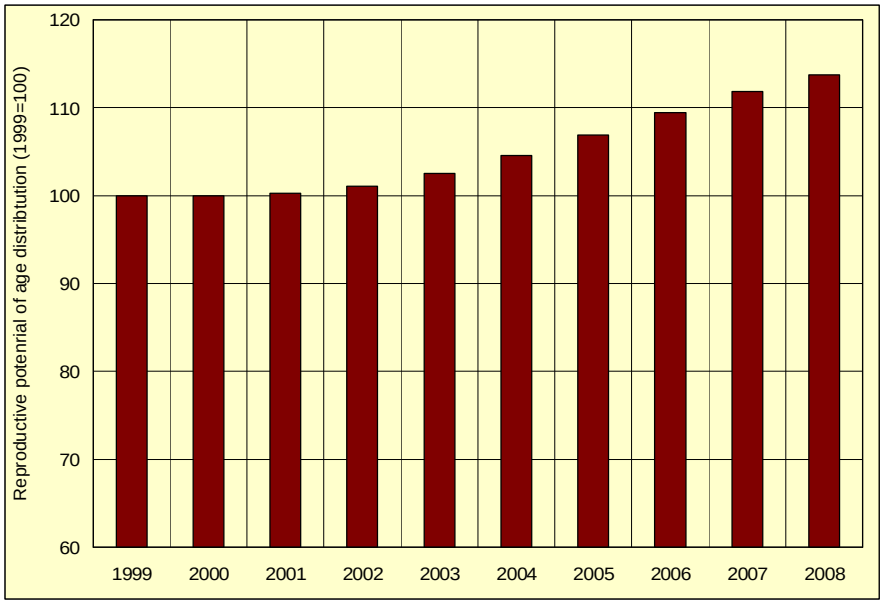
Fig. 8 - Age structure of females in reproductive age, 1999 and 2008



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Regarding overall natality, regardless the birth order, the following possible factors of its principal growth can be hypothesized: increasing reproductive potential of population and/or increasing overall level or/and changing age structure of fertility. Examining the changing number and age structure of Kazakhstani females (Fig.8) against fixed level and structure of fertility corresponding to the year 1999 the development of their reproductive potential can be traced. The number of women in the reproductive age (15-49 years) was substantially higher in the year 2008 than nine years before because numerous cohort of women born in the time of "perestroika", i.e during the second half of the 1990´s successively entered this age category. What was even more important, it was the fact that modal age of fertility distribution in 2008 almost fitted the modal age of the 2008 distribution of females in fertile age meanwhile in the year 1999 the highest proportions of fertile females corresponded to the lowest fertile age (below 18 years) and the age between 35 and 40 years, i.e. to the ages of relatively very low intensity of fertility of Kazakhstani women. Under these conditions the reproductive potential of Kazakhstani females was substantially higher in 2008 than in 1999. If the level and distribution of fertility would be identical in the former year as it was in the latter one than the number of children born only due to change in the number and age structure of potential mothers would be higher by 29.7 thousand (i.e. 14 %) in the year 2008 than the real number of children born in the year 1999 (Fig.9).

Fig. 9 – Reproductive potential of age structure of females in reproductive age, 1999-2008. ASFRs=1999



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Comparison of the real number of children born in 2008 with the model one based on the assumption that the total number and age structure of fertile females would remain unchanged. i.e. the same as they were in 1999, as well as with the increasing reproductive potential allow us to make another strong conclusion. Since the real increase of natality between 1999 and 2008 was about 66 % and reproductive potential grew only by about 14 %, it makes evident that the

contribution of the size and age structure changes in the contingent of fertile females to the overall increase was substantially smaller than the netto contribution of fertility increase itself.

8.2 Fertility and its age patterns transformation

The values of crude birth rate (CBR), the simplest indicator of natality, increased substantially since the end of the previous decade (Tab.3). In 1999 the level of CBR was 14.4 births per 1,000 inhabitants, and it reached 22.7 births per 1,000 inhabitants in 2008. So it increased by 8.3 births per 1,000 inhabitants within nine years.

The period of birth rate recovery was characterized by parallel developments of the general as well as total fertility rates (Tab.3). The general fertility rate (GFR) is a somewhat more refined characteristic than the crude birth rate because it relates births to the sex and age specific group of population, females at risk of giving birth to a child. This principal refinement helps eliminate distortions that might arise because of different age and sex distributions among populations. Thus, the general fertility rate is a better basis to compare fertility levels among populations than are changes in the crude birth rate is. Kazakhstan's GFR in 1999 was 52.9 live births per 1,000 women at ages of 15-49 and increased to 80.6 births per 1,000 women in 2008.

Tab. 3 – Birth and fertility rates, 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CBR (per 1,000 inhabitants.)	14.4	14.9	14.8	15.3	16.6	18.2	18.4	19.7	20.8	22.7
Standardized[1] CBR (per 1,000 inhabitants)	14.4	14.8	14.7	15.1	16.3	17.7	17.7	18.8	19.7	21.4
GFR (per 1,000 females 15-49 years old)	52.9	54.2	53.3	54.5	58.8	64.0	64.7	69.1	73.1	80.6
Standardized[1] GFR (per 1,000 females 15-49 years old)	52.9	54.5	53.9	55.4	59.8	64.9	65.1	69.1	72.3	78.7
TFR (per female 15-49 years old)	1.78	1.83	1.82	1.87	2.02	2.20	2.21	2.35	2.47	2.69

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: [1] The initial 1999 population was used as a standard population.

Comparison of the CBR values with its standardized alternatives illustrates the effect of changing age and sex composition of population upon the value of the birth rate, while the analogical comparison of the GFR values shows the effect of changing age structure of females in reproductive age. Standardized CBR and GFR were computed by applying the corresponding 1999 population structures as a particular standard.

It is obvious that the differences between the non-standardized and standardized CBR and GFR, in the years immediately following the base year of the standardization can only be slight, because changes in the composition of the population necessarily take place gradually. Following the previous remarks concerning the developments of the size and age structure of Kazakhstani females in reproductive age, the lower values of standardized CBR than non-standardized ones in all observed years reconfirm the positive impact of the observed size and structural changes on natality. Standardized GFR show another development during these years. It was higher than non-

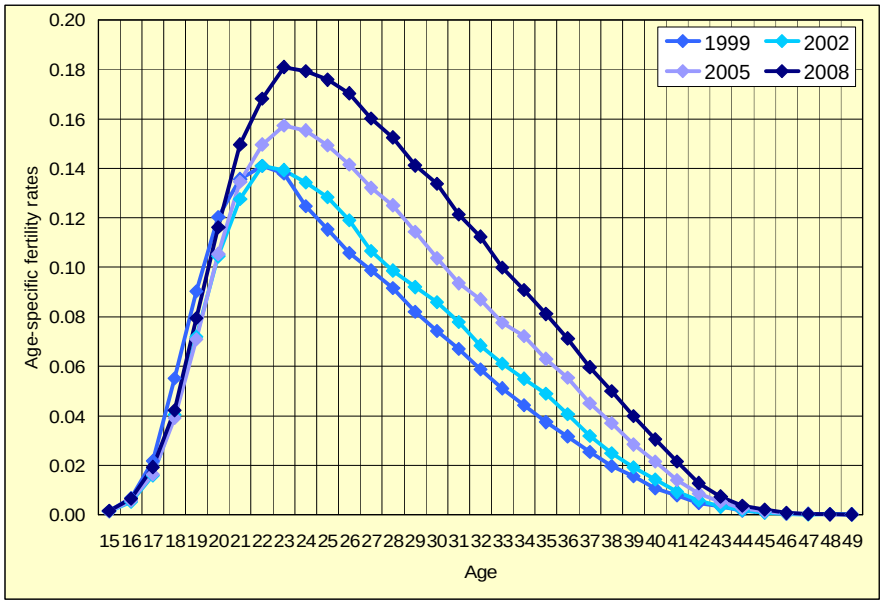
standardized CBR till the year 2006 and the last two years show that non-standardized GFR was substantially higher than the standardized one. Thus, we can say that changes in the age structure of the female population influenced enough and fertility rate would be slightly higher except the years of 2007 and 2008.

As our investigation of the age structure and the impact of its changes already signaled, the major factor staying behind the growth of natality is development of fertility. Total fertility rate (TFR) value increased from 1.78 children per woman in 1999 to reach the level of 2.69 children per woman in 2008 and so grew by 51% within nine years (Tab.3). This growth can be divided into two main stages. The first wave of growth corresponds with the period 2002-2004 when the TFR increased by 0.33 children and the second one covers the period 2005-2008 with the increase by 0.45. So the average annual growth observed was about 0.15 children per female.

Development of the fertility during these years was connected especially to already mentioned factors such as socio-economic development and growing stability of the country and intensive realization of births postponed during the crisis of the 1990s. Among important elements of socio-economic stabilization and progress one can find measures of population and family policies implementation, the extensive housing programs and growing employment. Government has supported in particular the families with children in terms of cash benefits like birth grants, child allowances and paid maternal leave (60 % of the last salary) which allows women to stay at home looking after a child up to three years. The housing programs are targeted to young families where special preferences are given to young families with higher number of children (State Program of Housing Construction in the Republic of Kazakhstan for 2005-2007).

To understand the observed changes in fertility, it is necessary to go into details, to see changes of fertility by age that directly mirrors changing reproductive behavior. The initial distribution of fertility based on the 1999 statistical data shows the highest childbearing intensity in the age group 20-24 with a rapid decrease in the following ages (Fig.10).

Fig. 10 – Fertility rates according age, 1999-2008, selected years



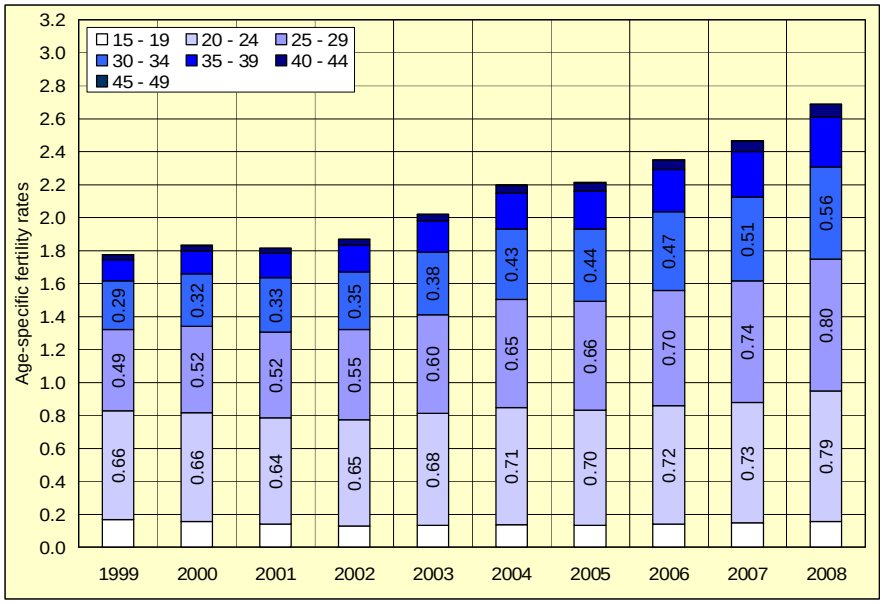
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

This structure of fertility is specific not only for Kazakhstan but for majority of the post-Soviet countries and in its principal features it corresponds with the Soviet model of fertility when women became mothers for the first time mostly early after reaching their age of twenty.

Comparing the distribution curves for the selected calendar years of the period in question (1999-2008) one can, however, see one principal change – progressive ageing of fertility. The TFR growth is not accompanied by overall increase of fertility. The occurred changes of its values are strongly differentiated by age. While in the youngest reproductive ages fertility decreased, especially in the age of 18 and 19 years, in almost all higher ages, between 21 and 46 years, it substantially grew. Regardless the universal growth of fertility by age between the years 2002 and 2008 which can be interpreted as a manifestation of principal positive change of reproduction conditions one can find signs of running transformation process in the observed development. It is not excluded that we have been witnesses of reproductive behavior modernization expressed by the shift of fertility into higher ages.

Steady shift of childbearing toward higher reproductive ages is very well visible also in aggregated view, throughout traditionally defined five-year age groups (Fig.11). In spite of fertility increase practically in all particular age groups during the years of observation, the contribution of the first two age groups (15-19 and 20-24 years) to the overall fertility (TFR) decreased meanwhile contribution of higher age-groups substantially increased. There is no doubt that the magnitude of changes in higher ages has been somehow influenced by previous fertility developments, especially by the postponement of maternity but the established trend of fertility ageing itself seems to be independent from the scale of postponement realization.

Fig. 11- Total fertility and its distribution by age, 1999-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

8.3 Fertility by birth order

The increase of TFR between 1999 and 2008 was observed among all birth orders (Tab.4). The relative increase in fertility was higher for third (66%) and fourth (80%) orders. However, the proportion of fertility rates by birth order in the total fertility is changing insignificantly in general. Current relative contributions of the first and second order fertility rates are slightly under their initial values. Nevertheless they still represent more than two thirds of the overall fertility. The third, fourth and fifth+ orders are slightly above their initial relative contributions. More than three children out of every ten were born in the third or higher order in the year 2008.

The principal role of preceding long-term intensive fertility postponements and realization of the accumulated reproductive potential in recent increase of its overall level is clearly proved by the 1st order TFR values being higher than one child of the first order per woman.

Tab. 4 – Fertility rate by birth order, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All births	1.78	1.83	1.82	1.87	2.02	2.20	2.21	2.35	2.47	2.69
1st order	0.76	0.78	0.78	0.78	0.85	0.90	0.90	0.94	1.00	1.12
2nd order	0.53	0.54	0.53	0.56	0.60	0.65	0.65	0.69	0.70	0.74
3rd order	0.27	0.29	0.28	0.30	0.33	0.37	0.38	0.41	0.42	0.45
4th order	0.13	0.14	0.15	0.15	0.16	0.18	0.18	0.21	0.22	0.24
5th and higher	0.09	0.08	0.08	0.08	0.09	0.10	0.10	0.11	0.12	0.14
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	42.8	42.5	42.7	41.7	42.0	40.8	40.9	40.0	40.7	41.8
2nd order	29.6	29.6	29.1	29.7	29.5	29.4	29.4	29.2	28.4	27.6
3rd order	15.3	15.6	15.5	16.0	16.3	17.0	17.0	17.3	17.2	16.8
4th order	7.4	7.8	8.3	8.2	7.9	8.0	8.1	8.8	8.9	8.8
5th and higher	4.8	4.5	4.4	4.4	4.4	4.6	4.4	4.6	4.8	5.1
Development index (1999=100)										
All births	100.0	103.1	102.2	105.2	113.7	123.7	124.5	132.4	138.8	151.3
1st order	100.0	102.3	102.0	102.3	111.5	117.8	118.8	123.7	131.9	147.5
2nd order	100.0	103.3	100.5	105.8	113.3	123.1	123.9	130.7	133.4	141.3
3rd order	100.0	105.3	103.7	110.0	120.8	137.4	138.4	149.4	155.8	166.2
4th order	100.0	107.9	114.1	115.9	121.4	133.5	136.0	157.5	166.6	180.0
5th and higher	100.0	97.1	92.5	96.8	103.7	118.9	113.5	127.0	137.6	158.8

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

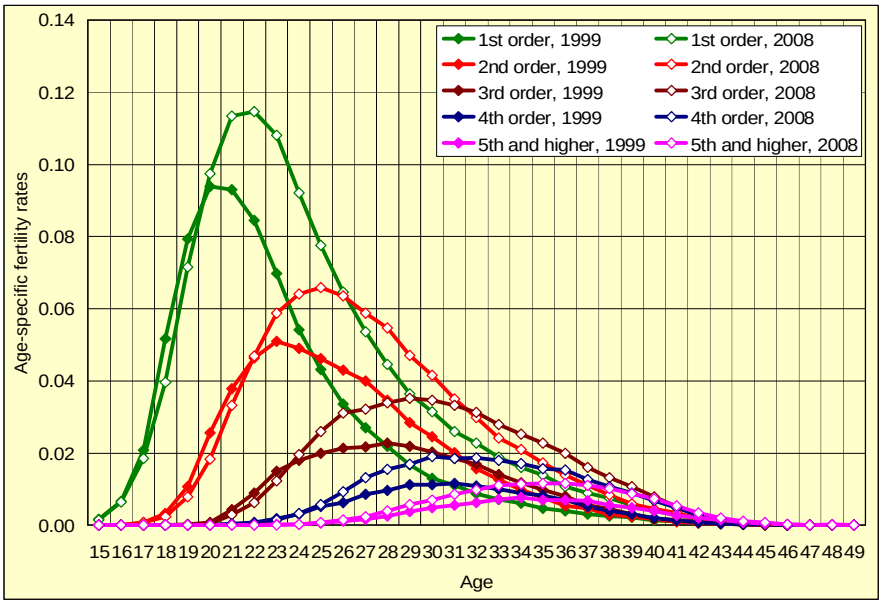
Note: Unknown births are excluded

Comparing the distribution curves of fertility by age corresponding to particular orders we can see two basic regularities in existing differentiation. The total intensity of fertility by birth order is decreasing by increasing order whereas concentration of fertility intensity by age is decreasing (Fig. 12). It is relatively logical since realization of fertility of a specific order is directly related to realization of fertility of lower order.

Observing the developments at this level of detail one can say that the above mentioned transformation of general fertility age structure has its specific course also according to particular birth order (Fig.12). In all cases the structure of fertility is ageing. The age of highest fertility is moving up, fertility of the youngest fertile women is decreasing at least in the case of the first, second and third children, and so the entire increase of fertility is accumulated into relatively wide intervals of the "post-modal" age.

As it was already mentioned, at all births orders the observed level of fertility was definitely higher in 2008 and occurred in relatively later ages than in 1999. In concrete numbers language the first-order children were with the highest intensity delivered by women at age of 20 years in 1999 and at 22 years in 2008. The comparable shift occurred in the second-order births. The second child delivery top intensity increased from 23 years of age in 1999 to 25 years in 2008. In higher orders the shifts

Fig. 12 - Changes in age and birth order specific fertility rates between 1999 and 2008



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

were more moderate since these orders are usually delivered by females closer to traditional models of reproduction and seem to be less sensitive to external conditions, i.e. did not postpone their motherhood so frequently and for so long time as other females. As a result, the modal age of fertility distribution corresponding to the third-order births grew from 28 to 29 years, to the fourth-order births from 31 to 30 years, and to fifth and higher-order births from 34 to 35 years.

Tab. 5 – Mean age of mother at childbirth, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All births	27.03	27.27	27.46	27.70	27.85	28.07	28.21	28.37	28.48	28.56
1st order	23.97	24.22	24.36	24.54	24.74	24.77	24.89	24.96	25.15	25.45
2nd order	27.07	27.25	27.53	27.73	27.88	28.10	28.25	28.33	28.42	28.39
3rd order	30.08	30.41	30.65	30.90	31.12	31.33	31.57	31.65	31.72	31.71
4th order	32.49	32.60	32.80	32.90	33.02	33.22	33.50	33.58	33.59	33.58
5th and higher	35.71	35.95	35.82	35.89	35.83	36.00	36.05	36.05	36.01	35.96

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

More precise picture of ageing of order-specific fertility in Kazakhstan during the period 1999-2008 is provided by the time series of mean age of mother at childbearing calculated from the values of observed age-specific fertility rates by birth-order (Tab.5). Between the beginning and the end of the period, the mean age at childbearing generally increased by 1.26 years reaching the level of 28.56 years. It is especially a result of the first births postponement to higher ages since the births of this order have the highest weight among all births. The evaluation of modal age developments signals that the shift of age at the second childbearing is followed by the similar shift in the first one. Nevertheless, comparisons of the mean age values indicate that the second-order births timing could be set with the aim to compensate partially the postponement of the first ones. Unfortunately, the data for the given period reflects transition to a new model of reproductive behavior as well as partial compensation of reproductive losses due to massive postponement of reproduction in the 1990s. Therefore it is rather complicated to interpret the observed changes and to determine in what reproduction timing they are going to result.

Specific character of the past decade regarding developments of fertility patterns is underlined by results of a further analytical step employing other type of central values - the quartiles (Tab.6).

Tab.6 – Age distribution of fertility, 1999-2008, selected years

	Lower quartile	Median	Upper quartile
1999			
All births	22.10	25.50	30.10
1st order	20.30	22.40	25.40
2nd order	23.10	25.80	29.20
3rd order	26.10	29.20	32.60
4th order	28.70	31.70	35.00
5th and higher	32.10	35.10	38.20
2004			
All births	23.10	26.70	31.40
1st order	21.10	23.30	26.40
2nd order	24.10	26.90	30.50
3rd order	27.20	30.50	34.20
4th order	29.30	32.60	36.00
5th and higher	32.30	35.60	38.60
2008			
All births	23.50	27.30	32.10
1st order	21.40	23.90	27.50
2nd order	24.30	27.20	30.80
3rd order	27.50	30.80	34.50
4th order	29.60	32.80	36.30
5th and higher	32.40	35.50	38.50

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

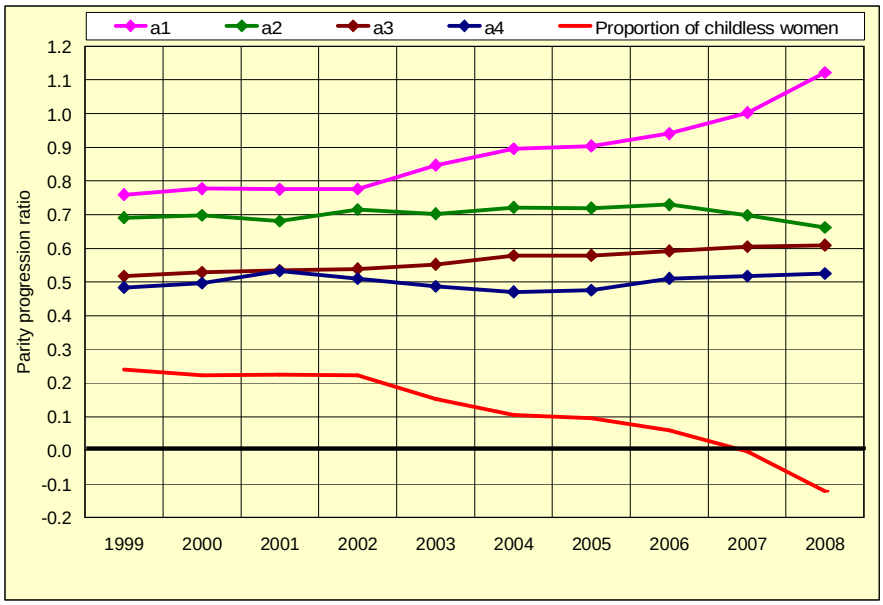
The values of median, the middle quartile, in particular and their comparison bring a third picture of changes in fertility timing. There is practically the uniform shift in the first, second and third-birth order fertility median age. It represents about one and a half year increase, meanwhile in the case of the fourth-order and fifth-order the values of median grew by 1.1 and 0.4 years respectively.

An interesting more complex picture of changing timing of fertility can be drawn using more detailed analysis of inter-quartile distances and their development. First of all, the period in question can be clearly characterized by increasing variability of fertility by any birth-order. The difference between upper and lower quartile characterizing the concentration of the middle half of realized fertility increased in the case of general fertility approximately by 0.6 years when for the first order the same indicator grew by about 1.0 year and reached the same value (6.1 years) as for the fifth and higher orders. This is just another confirmation of the above mentioned principal changes in fertility that are occurring and that they are not represented only by increase of the overall fertility levels. Moreover, the unique position of the first-order fertility transformation among the observed changes is documented also by development of some other characteristics based on quartiles. For instance, the asymmetry of distribution measured through inter-quartile differences substantially increases when the difference between distances of median from lower and upper quartiles increased from 0.9 to 1.1 years.

As it has been known among demographers since the works of Ryder (1964), and Bongaarts and Feeney (1998), delays in the timing of childbirth can have dramatic effects on cross sectional measure such as the period TFR. When births are postponed to older ages, they reduce the number of births seen in a given period, making the period TFR lower even if cohort fertility (Completed fertility rate – CFR) remains unchanged. During periods of compensation situation can be similar in the sense that principal increase of the TFR in influencing values of CFR only marginally. Thus, the recently observed dynamic growth of the TFR in Kazakhstan can leave the CFR on relatively low level.

Unnatural character of period indicators and their limited applicability in the process of demographic cognition is visible especially in the periods of extraordinary changes and developments. Parity progression ratio (PPR) based on period total fertility rates by birth order for Kazakhstan, its values and their developments during the period 1999-2008 can serve as an explicit example (Fig.13). The PPR shows the risk of delivering a child of particular order during one year period by women having already a child of the previous order under the condition that the female would be exposed during her entire reproductive age to the fertility age-specific intensities equal to the fertility observed or introduced. According to the fertility intensities observed in the year 1999 the probability of the transition from the childlessness to a first-order birth was equal 0.76 what means that there would be about 24 % of childless woman among those entering reproductive age if fertility would remain unchanged for the following 35 years. It is relatively very high proportion of childless females in any population and therefore it has not been surprising when the initial PPR at parity 0 started to grow in 2003. During the year 2007, however, the PPR value of 1.00 was reached and continued to grow to the level of 1.12 which is far away behind any rational interpretation of the PPR as a probability.

Fig. 13 – Parity progression ratio, 1999-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

This situation arose as the consequence of intensive postponement of maternity during the 1990's. Concentrated realization of the postponed first births by females in higher reproductive ages went alongside with fertility increase in younger ages. Thus, in 2007 as well as in 2008 many women of different birth generations delivered a child for the first time and in sum they demonstrated the first-order TFR higher than 1.0.

Concerning other birth orders, approximately 70 % of women having the first child would have under the mentioned assumptions the second child in 1999 and 52 % respectively. 49 % of the previous parity would deliver the third-order respectively fourth-order births. In 2008, the corresponding probabilities were: 0.66, 0.60 and 0.52. It is clear from this figures that the probability of second, third and fourth order has remained almost stable over the period. When interpreting these numbers one have to take into account the fact that the parity specific ASFRs presented here belong to the category of reduced rates when in the denominator we use all females from the given age group. It also complicates our interpretations and therefore the presented results have more illustrative than fully-fledged cognitive value.

Generally, interpretation of fertility changes can be given by means of wide scope of factors influencing family formation and parenthood. Lesthaeghe (2001) lists seven general and seven country-specific factors contributing to the postponement of childbearing. He distinguishes two groups of factors, general and country specific ones. Among the general factors he mentioned are: (a) increased female education and female economic autonomy; (b) rising and high consumption aspirations that created the need for a second income in households and equally fostered female labor force participation; (c) increased investments in career developments by both sexes, in tandem with increased competition in the workplace; (d) rising 'post-materialist' traits such as self-actualization, ethical autonomy, freedom of choice and tolerance for the non-conventional; (e) a greater stress on the quality of life with a rising taste for leisure; (f) a retreat from irreversible commitments and a desire for maintaining an 'open future'; (g) rising probabilities of separation

and divorce, and hence a more cautious 'investment in identity'. On the list of country-specific factors one can find: (a) the geographical mobility of young adults in tertiary education; (b) lack or availability of state subsidies for students in the forms of fellowships, housing facilities and transportation subsidies; (c) the flexibility of the labor market, including the possibilities for part-time work; (d) youth unemployment; (e) minimum income guarantees; (f) costs and availability of housing, both for 'starters' and for households in later stages of family formation (often linked to the structure of labor market and its regulations); (g) contraceptive availability and methods mix; (h) access to abortion.

Practically all of the above mentioned factors play more or less important role in transforming age patterns of fertility in Kazakhstan. Nowadays Kazakhstani women have in general more opportunities than in the past. Practically free access to contraceptives as well as to invasive methods of fertility termination have made it a lot easier for women or couples to choose when they want children and how many. Among other factors significantly influencing observed developments of fertility can be listed, for instance, increasing women's labor force participation, their growing economic independence, emerging transformation of traditional family relations, especially acceptance and higher frequency of cohabitation and increasing number of divorces. In general, observed changes in fertility distribution by age reflect a wide and complex socio-economic transformation based primarily on growing importance of attained education, income, occupational status, greater economic independence and more equal position of women in families. Last but not least, frequent housing problems, especially among young people, and insufficient access to child care facility centers are playing an important role in formation of reproductive behavior and consequently are also reflected in the observed fertility patterns.

Chapter 9. Differential fertility

9.1 Urban-rural differences

Urban-rural differences are among the most widely studied socio-economic differentials in fertility, especially in countries where differences between urban and rural life are major in general. In that case the difference in the type of settlement usually leads to differences in fertility. A theory that has often been suggested to explain the observed differences in rural and urban fertility centers around the argument that these differences can be explained by differing compositional characteristic with respect to such factors as educational, occupational, work status and income differences between rural and urban populations (United Nations, 1987).

Women in urban areas are expected to desire smaller families, to marry later, to use contraception more often and possibly to use it more efficiently, and to breast-feed less and for shorter durations. While the differences in age at marriage, contraceptive use and family size preferences are likely to result in lower urban fertility, the differences in breast-feeding behavior may result in higher fertility. Several studies have documented these expected residential differences in the variables (United Nations, 1987).

Highly urbanized areas are the traditional in the sense of universal hubs of innovations including those in population behaviors. It is in urban areas that traditional way of life first begins to break down, due to industrialization and modernization. Couples develop preferences for smaller families, and the use of various methods of fertility control spreads among the urban population. These changes have the effect of reducing urban fertility first, so that significant differences between urban and rural fertility levels are arising.

It is why the populations of the urban areas through most of the world show lower birth rates than rural populations do. Similar situation has been observed in Kazakhstan as well. Even, if the difference is not highly significant today, but it still exists. These differences over the last two decades have been strongly reduced as a result of rapid increase of fertility level in urban areas.

To understand urban-rural differences in fertility behavior it is necessary to take into consideration the particular social characteristics of the both types of living environment. Mackensen (1982) believes that one general theory of fertility that could adequately explain fertility behavior in all societies and at all periods of time is neither possible nor justifiable. He is convinced that for this reason, every explanation, observation and research of fertility behavior like any other social behaviour should proceed from the concept of specific structural and cultural characteristics of each society, which is the product of certain historical processes.

Recently, in the end of the year 2008, the majority of Kazakhstani population lived in urban areas (53.2% or 8.4 million people). Rural population represented about 46.8% of the total population, i.e. about 7.4 million inhabitants. High level of urbanization in Kazakhstan is typical since the existence within the USSR. In the year 2006 the size and proportion of rural population increased due to administrative redefinition of urban and rural settlements resulting in reclassification of some smaller urban settlements to rural ones. As a consequence, the proportion of

rural population showed a step increase by about 4.5 per cent points i.e. by more than 10 % at the beginning of 2007.

9.1.1 Natality and changing age structure of females in reproductive age

Dynamic growth of natality identified at the level of the country has been observed in rural as well as in urban areas (Tab.7). It is worth to mention that the absolute increase was substantially higher in urban than in rural areas regardless the fact that proportion of urban population markedly decreased by the end of the period of observation.

Tab. 7 –Live births by birth order and place of residence, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Urban										
					Absolute numbers					
All births	109,443	114,629	114,175	121,994	138,525	155,355	163,537	175,278	174,075	196,764
1st order	55,608	57,881	58,115	61,122	69,466	75,489	79,846	84,520	85,470	96,382
2nd order	32,920	34,497	34,116	37,084	41,676	47,455	49,507	53,064	52,080	57,913
3rd order	13,247	14,260	14,054	15,462	17,976	21,422	22,493	24,393	24,079	27,217
4th order	4,927	5,246	5,421	5,728	6,459	7,456	8,081	9,415	8,900	10,784
5th and higher	2,741	2,745	2,469	2,598	2,948	3,533	3,610	3,886	3,546	4,468
					Proportion (per cent)					
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	50.8	50.5	50.9	50.1	50.1	48.6	48.8	48.2	49.1	49.0
2nd order	30.1	30.1	29.9	30.4	30.1	30.5	30.3	30.3	29.9	29.4
3rd order	12.1	12.4	12.3	12.7	13.0	13.8	13.8	13.9	13.8	13.8
4th order	4.5	4.6	4.7	4.7	4.7	4.8	4.9	5.4	5.1	5.5
5th and higher	2.5	2.4	2.2	2.1	2.1	2.3	2.2	2.2	2.0	2.3
					Development index (1999=100)					
All births	100.0	104.7	104.3	111.5	126.6	142.0	149.4	160.2	159.1	179.8
1st order	100.0	104.1	104.5	109.9	124.9	135.8	143.6	152.0	153.7	173.3
2nd order	100.0	104.8	103.6	112.6	126.6	144.2	150.4	161.2	158.2	175.9
3rd order	100.0	107.6	106.1	116.7	135.7	161.7	169.8	184.1	181.8	205.5
4th order	100.0	106.5	110.0	116.3	131.1	151.3	164.0	191.1	180.6	218.9
5th and higher	100.0	100.1	90.1	94.8	107.6	128.9	131.7	141.8	129.4	163.0

Tab. 7 –Live births by birth order and place of residence, 1999-2008… continue

Rural										
					Absolute numbers					
All births	105,649	106,876	105,272	104,701	109,012	116,825	114,750	125,955	147,455	159,700
1st order	39,476	39,507	39,368	37,362	39,328	41,691	40,847	43,932	54,024	61,468
2nd order	30,110	30,460	28,966	29,571	30,435	31,899	31,701	34,334	38,919	40,574
3rd order	18,607	19,071	18,646	19,275	20,321	22,490	22,151	24,393	27,518	28,769
4th order	10,320	11,076	11,766	11,716	11,853	12,786	12,655	14,801	17,015	17,598
5th and higher	7,136	6,762	6,526	6,777	7,075	7,959	7,396	8,495	9,979	11,291
					Proportion (per cent)					
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	37.4	37.0	37.4	35.7	36.1	35.7	35.6	34.9	36.6	38.5
2nd order	28.5	28.5	27.5	28.2	27.9	27.3	27.6	27.3	26.4	25.4
3rd order	17.6	17.8	17.7	18.4	18.6	19.3	19.3	19.4	18.7	18.0
4th order	9.8	10.4	11.2	11.2	10.9	10.9	11.0	11.8	11.5	11.0
5th and higher	6.8	6.3	6.2	6.5	6.5	6.8	6.4	6.7	6.8	7.1
					Development index (1999=100)					
All births	100.0	101.2	99.6	99.1	103.2	110.6	108.6	119.2	139.6	151.2
1st order	100.0	100.1	99.7	94.6	99.6	105.6	103.5	111.3	136.9	155.7
2nd order	100.0	101.2	96.2	98.2	101.1	105.9	105.3	114.0	129.3	134.8
3rd order	100.0	102.5	100.2	103.6	109.2	120.9	119.0	131.1	147.9	154.6
4th order	100.0	107.3	114.0	113.5	114.9	123.9	122.6	143.4	164.9	170.5
5th and higher	100.0	94.8	91.5	95.0	99.1	111.5	103.6	119.0	139.8	158.2

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

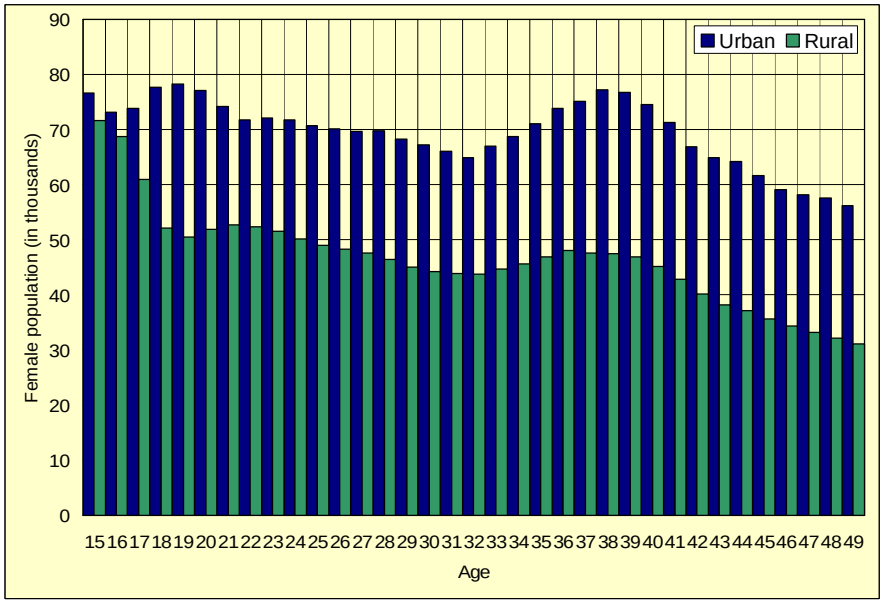
In urban areas the absolute numbers of live born children increased from 109.4 thousand in 1999 to 196.8 thousand in 2008 and so within nine years it increased by 87.3 thousand live births while in rural areas it increased from 105.6 thousand to 159.7 thousand, i.e, by 54.0 thousand live births during the same period. Development index clearly illustrates these dynamics and as a result the difference in the natality increased between these areas as the absolute number of live born children in urban areas was more than three-fourth higher in 2008 than in 1999 and in rural areas it was higher by about a half. The difference amounted to 3.7 thousand live births in 1999 and the gap increased to 37.1 thousand live births in 2008 being higher in both years in urban areas. As a result, urban areas ensured over 55.2 % of the total number births in the year 2008.

The relative structure of live births by birth order is completely different in rural and urban populations (Tab.7). In urban settlements about 50 % of children were born in the first order during the period in question, in rural settlements it was less than one third of all newly born for several years and only the recent development increased the proportion of the first-order births. Similar situation has been observed for the second-order births. In urban areas these have represented about 30 % meanwhile in rural settlements their proportion was around 28 % in 1999 and recently, in the year 2008 even got near 25 %. Significantly larger proportion of higher order births in rural areas is a result of relatively frequent existence of traditional families with many children. Proportion of the fourth-order children among newly born is in rural environment twice higher than in urban ones and

in the case of the fifth and higher order even more than three times higher. These proportions were more or less stable over the entire period of observation.

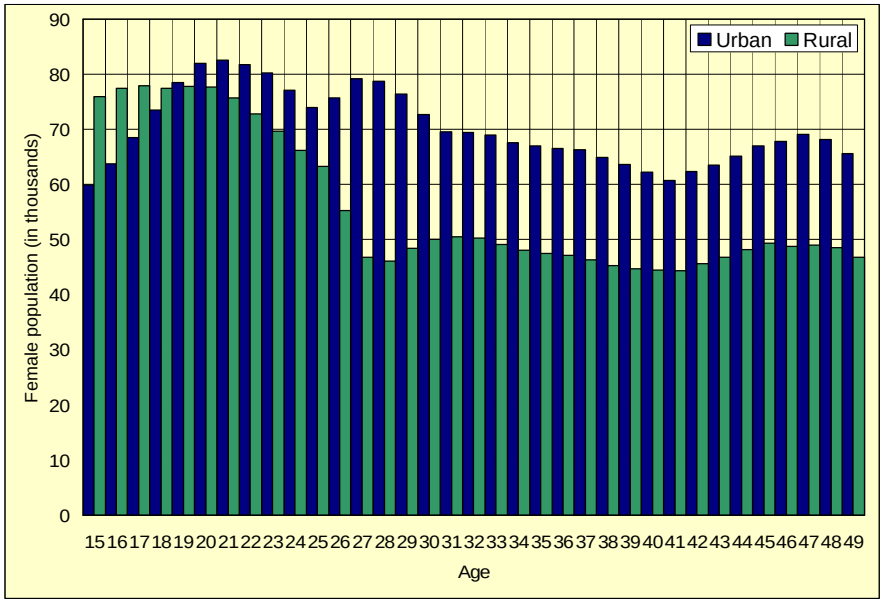
Growing natality in both subpopulations has reflected among others favorable development of age structure and correspondingly growing reproductive potential. The number of women in the reproductive age was logically higher in urban areas in both time periods, in 1999 as well as in 2008 (Fig.14, 15). The age distribution of females in reproductive age was definitely less favorable regarding natality in both areas in 1999 than in 2008.

Fig. 14 – Age structure of females in reproductive age by place of residence, 1999



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

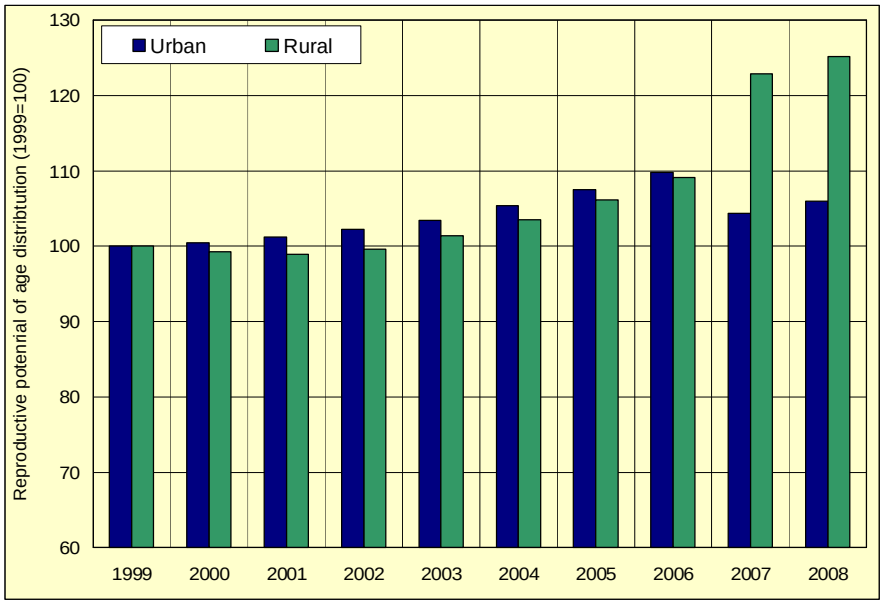
Fig. 15 – Age structure of females in reproductive age by place of residence, 2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

The highest concentration of fertile women in 2008 was in the age group 20-29 years where fertility is generally reaching its top levels whereas in 1999 the highest proportions of fertile females was observed in younger ages (15-19 years) and inthe age groups 35-39 years. In rural areas the situation was very similar in the year 1999 but in the year 2008 the highest number of potential mothers was concentrated in the age interval between 15 and 25 years. Thus, in both areas the reproductive potential of women was substantially higher in 2008 than in 1999 (Fig.16). Under the assumption that the level and distribution of fertility in 2008 would be the same as in 1999 then the number of live births would be 6.6 thousand higher in urban areas and 26.6 thousand higher in rural areas. This sudden difference and slump in reproductive potential of urban subpopulation is directly related to the above mentioned administrative redefinition of urban and rural settlements in the year 2006 which has increased population in rural areas and decreased it in urban environment.

Fig. 16 – Reproductive potential of age structure of females in reproductive age 1999-2008. ASFRs=1999



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Taking into account that the number of live births in urban population increased by 79.8 % and reproductive potential by only 6.0 % between 1999 and 2008, it can be concluded that the remaining change of natality which amounts to 73.2 % is a result of fertility increase Development of reproductive potential in rural areas lagged behind its development in the rest of the country until the administrative reclassification of settlements. Then it jumped by more than ten percentage points and reached the level for 25.0 % higher in comparison with the year 1999. As a result one can state that the increase of fertility level and reproductive potential contributed approximately equally to the 50% increase of natality in rural areas between 1999 and 2008.

9.1.2 Fertility and its age patterns transformation

In urban areas the crude birth rate (CBR) increased from 13.2 births per 1,000 inhabitants in 1999 to 23.6 births per 1,000 inhabitants in 2008 and so increased by 10.4 births per 1,000 inhabitants in nine years (Tab.10). In rural areas in the same nine years it increased by 5.4 births per 1,000 inhabitants, from 16.4 births per 1,000 inhabitants in 1999 to 21.8 births per 1,000 inhabitants in 2008. It seems that urban population is a moving force of current growth of natality and its intensity in Kazakhstan. However, the CBR is a characteristic that can be influenced by age and sex structure of a population. Moreover, as it was already mentioned data for the end of the period in question are covering significantly different set of settlements than in its beginning. At the same time, the proportion of young females in reproductive age and their internal age structure are crucial factors determining the CBR value.

Tab. 8 – Birth and fertility rates by place of residence, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Urban										
CBR (per 1,000 inhabitants.)	13.0	13.6	13.6	14.4	16.3	18.2	18.9	20.0	21.2	23.6
Standardized[2] CBR (per 1,000 inhabitants)	13.0	13.6	13.4	14.2	16.0	17.7	18.3	19.2	20.0	22.2
GFR (per 1,000 females 15-49 years old)	44.9	46.7	46.2	48.9	54.9	60.9	63.3	67.1	71.2	79.9
Standardized[2] GFR (per 1,000 females 15-49 years old)	44.9	46.8	46.3	49.1	55.1	61.0	63.0	66.2	69.1	76.7
TFR (per female 15-49 years old)	1.53	1.60	1.58	1.68	1.88	2.09	2.16	2.27	2.37	2.63
Rural										
CBR (per 1,000 inhabitants.)	16.2	16.5	16.4	16.3	17.0	18.1	17.7	19.3	20.2	21.7
Standardized CBR (per 1,000 inhabitants)	16.2	16.5	16.4	16.3	16.8	17.8	17.2	18.5	19.3	20.5
GFR (per 1,000 females 15-49 years old)	65.0	65.3	64.0	63.0	64.8	68.7	66.7	72.2	75.6	81.5
Standardized GFR (per 1,000 females 15-49 years old)	65.0	66.2	65.7	65.4	67.5	71.4	68.9	74.1	77.2	82.2
TFR (per female 15-49 years old)	2.16	2.21	2.20	2.19	2.26	2.40	2.32	2.50	2.61	2.79

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: [2] The initial 1999 population was used as a standard population.

Another indicator, the general fertility rate (GFR) which removes population which is not directly exposed to childbearing from denominator and so increases comparability of obtained results has shown that the GFR value in urban areas increased from 44.9 births per 1,000 females in age 15-49 years in 1999 to 79.9 births per 1,000 females in age 15-49 years in 2008 while in rural areas it increased from 65.0 to 81.5 births, so in nine years the increase represented 35.0 births per 1,000 females in age 15-49 years in urban areas and 16.5 births per 1,000 population females in age 15-49

years. In this case, it seems that rural population is undergoing more intensive reproduction if we take into account differences in proportion of fertile age women in population.

None of these indicators, however, do provide us with the answer where the intensity of reproduction is really higher and where lower since disturbing effect of different age distribution of females in reproductive age is removed neither by the CBR nor by the GFR.

Eliminating the influence of representation of females in reproductive age in the population and their age structure through standardization one can see that development of age structure of the observed contingent of females influenced positively natality in both subpopulations. It is because the values of standardized CBR are lower than those of non-standardized one. The standardized GFR values however differ by their basic character: for rural population the terminal (2008) value is higher and for urban one it is lower than the values of non-standardized GFR (Tab.8).

The best idea about intensity of childbearing (fertility) provides total fertility rate, the indicator which is not influenced by sex and age distribution of any part of corresponding population. Comparing its values in time series we can definitely state that the fertility level during the entire period 1999-2008 was significantly higher in rural than in urban areas. It means that substantially higher numbers of live births in urban areas were the result of higher numbers, higher proportion and more favorable age structure of females in reproductive age in urban population than in rural one.

The natural difference between the observed levels of the overall fertility in rural and urban areas lasted over the entire period of observation. The most explicit trend of fertility development in rural-urban differentiation was the dynamic growth and convergence of corresponding values. In the beginning (1999) fertility of urban females was deeply below the replacement level when it reached 1.53 live born children per female during the entire reproductive period whereas rural females still kept reproduction slightly above this level since their reported TFR was equal 2.16 children. Experienced improvements of living conditions and first promising developments in economic sphere in the beginning of the current decade resulted in dynamic changes in reproductive behavior of urban as well as rural populations after the year 2001. Until 2008 the TFR in urban environment grew by 1.10 live born children per female when it reached 2.63 children per female. In the same time framework the TFR in the set of rural settlements increased “only” by 0.63 children and reached 2.79 children. In this way the original difference between rural and urban fertility counting 0.63 children (1999) diminish by almost 75 per cent to 0.16 children in the year 2008.

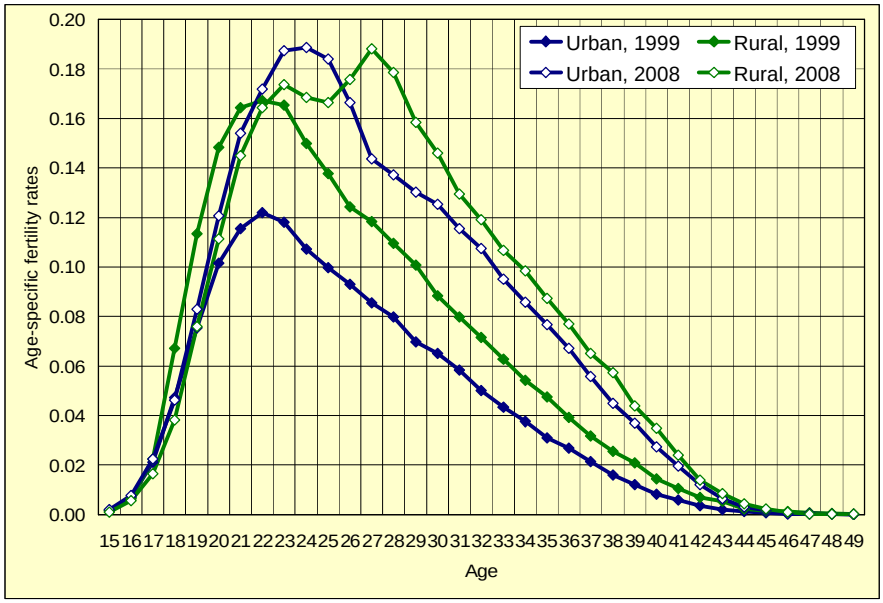
Several important factors of the described changes could be identified. One of them is changing ethnic composition of population in these areas. During the 1990s and the first half of the 2000s the members of different, mostly “low fertility” ethnic groups emigrated from the country. They mostly represented urban population and their places were predominantly taken by members of “higher fertility” ethnic groups. Especially young Kazakh population, more frequently females than males and families with high reproductive potential moved from rural (or like Oralmans from foreign countries) to urban areas. The second important factor resulting in higher pace of fertility increase

in urban areas is their role in diffusion of innovations including the improvement of population living standard which undoubtedly affected reproductive behavior of population. Last but not least, a principal part of the observed dynamics and total change of urban fertility can be accounted to accumulation of a principal reproductive potential through the long-term massive postponement of maternity, much more robust than one could see in the case of rural fertility during the 1990s and 2000s.

According to R. Andorka's views (Andorka, 1978) a relationship between fertility behaviour and place of residence was characterized as a direct linkage. There is a fairly consistent correlation between urban or rural trait of the place of residence and fertility. The place of residence has a property of natural or man-made environment. In this sense highly populated, densely build-up areas heavily loaded with traffic are defined as urban areas. Correspondingly, there is little space left for parks, private gardens and other places where children can safely spend time outside their homes. On the other hand, the trait of rural area is determined by living predominantly in a one-family house with garden or in a relatively small apartment house. Life there is quieter and safer and children have plentiful space for playing outside their homes. According to Andorka, this ecological characteristic of urban-rural differential is also connected with different monetary costs and efforts necessary for raising and educating children that are much greater in urban areas than in the rural ones. These differentiating conditions explain in general an important part of existing differences between rural and urban models of reproduction.

Differences between rural and urban reproduction are not concerning only the overall levels of fertility but also and in particular fertility age patterns. The corresponding profiles of rural and urban fertility distribution by age in the marginal years of the period in question are presented in Fig.17. In the year 1999, the distribution of fertility by age in urban areas looked like a reduced

Fig. 17 – Fertility rates according age and by place of residence, 1999-2008 selected years

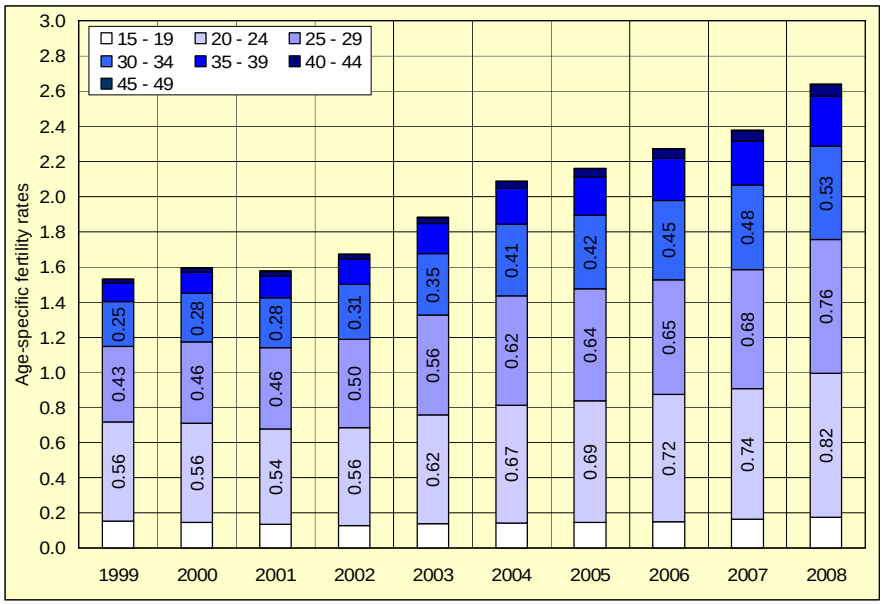


Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

copy of similar distribution in the rural ones. In both subpopulations the age groups of the highest fertility were 20-24 in 1999. Rural fertility, however, was still high also in early reproductive ages of 18 and 19 years whereas early fertility in urban environment was already stabilized in the beginning of observation and its intensity did not change during the following nine years. Fertility in both urban and rural areas moved to higher ages during the period of observation. The modal age increased approximately from 22 in 1999 to 24 in 2008 in urban areas, while in rural areas there was slight fluctuation in 2008 and the peak age sharply increased from 22 in 1999 to 27 in 2008 and increased by 5 years over the period. Intensity of reproduction increased in most of ages but the principal changes occurred between 30 and 42 years of life. It allows us to connect at least a part of these changes to realization of fertility postponed during previous years.

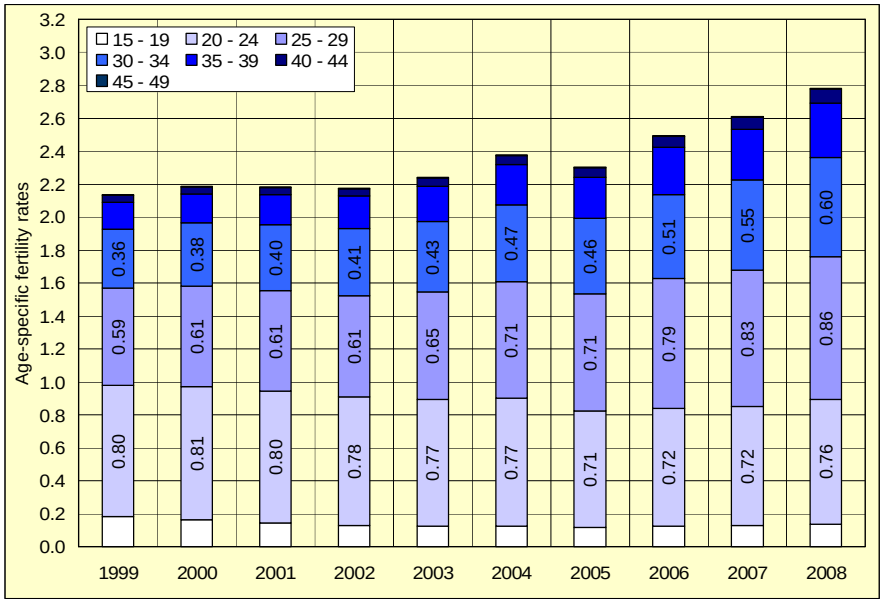
The development of fertility by five-year age groups gives possibility to identify or clarify some existing differences in age distribution of intensities between rural and urban environments. While urban fertility was growing with more or less similar relative increase of its intensity in all age groups, the recorded changes of rural fertility took place almost exceptionally in higher ages, between the second and fourth quarter of the reproductive age segment (Fig. 18 and 19).

Fig. 18 – Total fertility and its distribution by age in urban areas, 1999-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 19 - Total fertility and its distribution by age in rural areas, 1999-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

As a result of described developments the relative contribution of particular age groups also significantly changed. The relative contribution of the most exposed age group 20-24 years to the total fertility rate value decreased by 5.8 % in urban areas and by 10.0 % in rural areas between 1999 and 2008. Higher age groups' contribution increased moderately; about 4.0 per cent increase in 30-34 and 35-39 age groups was observed in urban areas and 5.0 per cent increase in rural areas in 2008. Thus, the decrease in fertility intensity recorded among women in age group 20-24 was replaced by growth in fertility among women of higher age groups. However, in this regard it is not clear, if the fertility in higher ages will increase further or whether it will decrease. It only can be said that the shift in fertility to higher ages is occurring in both areas and its effect on final level of fertility was substantially higher in 2008 than in 1999.

9.1.3 Fertility by birth order

To understand better the differences in fertility between rural and urban women one can analyze it in depth by birth order to see more detailed structure of occurred changes and resultant differences.

Comparing the values of TFR by birth order, we can state that the increase of fertility between years 1999 and 2008 was universal in both rural and urban populations since it occurred in all the observed birth orders from 1 to 5+ (Tab.9). Very frequent occurrence of maternity postponements in urban areas during the1990s and the beginning of the 2000s and its concentrated realization afterwards resulted in the first birth TFR being higher than 1.0 since 2005. Its terminal value (1.25 children of the first-order born per female and its entire reproductive period) reflects very well the scale and dynamics of fertility changes during the past two decades.

The numbers in Tab. 9 present some noticeable structural differences between rural and urban fertilities. Higher proportion of traditional large families in the Kazakhstani countryside resulted recently in higher levels of fertility starting from the third birth order. Therefore proportion of the first and second order births among newly born is substantially lower (about 59 %) in rural areas then in urban ones (about 77 %) where two-child family model already clearly prevails. Unlike in urban areas there are no clear preferences regarding family size in rural areas.

Tab.9 – Fertility rate by birth order and by place of residence, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Urban										
All births	1.53	1.60	1.58	1.68	1.88	2.09	2.16	2.27	2.37	2.63
1st order	0.76	0.79	0.79	0.82	0.92	0.98	1.02	1.05	1.12	1.25
2nd order	0.47	0.49	0.48	0.52	0.57	0.64	0.66	0.69	0.71	0.77
3rd order	0.19	0.21	0.20	0.22	0.26	0.30	0.31	0.33	0.35	0.38
4th order	0.07	0.08	0.08	0.08	0.09	0.11	0.11	0.13	0.13	0.16
5th and higher	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.05	0.07
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	49.7	49.3	49.7	48.8	48.8	47.0	47.1	46.5	47.5	47.6
2nd order	30.5	30.5	30.2	30.7	30.4	30.8	30.6	30.5	30.1	29.5
3rd order	12.4	12.8	12.7	13.1	13.5	14.4	14.4	14.7	14.6	14.5
4th order	4.6	4.7	4.9	4.9	4.9	5.1	5.3	5.8	5.5	5.9
5th and higher	2.5	2.4	2.2	2.2	2.2	2.4	2.4	2.4	2.3	2.5
Development index (1999=100)										
All births	100.0	104.4	103.4	109.7	123.2	136.5	141.1	148.3	154.9	171.9
1st order	100.0	103.7	103.4	107.8	121.0	129.2	133.9	138.8	148.1	164.7
2nd order	100.0	104.4	102.5	110.6	122.7	137.7	141.3	148.6	152.7	166.0
3rd order	100.0	107.8	106.0	116.1	134.1	158.0	163.9	175.0	181.6	200.9
4th order	100.0	107.1	110.6	116.9	131.1	150.4	161.6	185.9	185.3	220.1
5th and higher	100.0	100.9	91.2	96.2	109.2	131.0	133.2	142.6	137.8	170.7

Tab.9 – Fertility rate by birth order and by place of residence, 1999-2008… continue

Rural										
All births	2.16	2.21	2.20	2.19	2.26	2.40	2.32	2.50	2.61	2.79
1st order	0.77	0.78	0.78	0.73	0.75	0.77	0.73	0.76	0.83	0.94
2nd order	0.61	0.62	0.60	0.62	0.63	0.66	0.64	0.68	0.68	0.69
3rd order	0.39	0.41	0.41	0.42	0.45	0.50	0.49	0.53	0.54	0.56
4th order	0.22	0.24	0.26	0.26	0.27	0.29	0.29	0.34	0.35	0.36
5th and higher	0.16	0.15	0.15	0.16	0.16	0.19	0.17	0.20	0.21	0.24
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	35.7	35.2	35.3	33.1	33.0	32.0	31.4	30.3	31.9	33.8
2nd order	28.2	28.3	27.4	28.3	28.0	27.4	27.6	27.0	26.1	24.8
3rd order	18.2	18.5	18.4	19.3	19.8	20.7	21.0	21.3	20.7	20.0
4th order	10.4	11.0	12.0	12.1	11.8	12.1	12.4	13.4	13.3	12.9
5th and higher	7.3	6.8	6.7	7.1	7.2	7.7	7.4	7.9	8.0	8.5
Development index (1999=100)										
All births	100.0	102.2	101.6	101.2	104.7	111.1	107.5	115.8	120.9	128.9
1st order	100.0	100.8	100.4	93.9	96.8	99.5	94.4	98.3	107.9	122.0
2nd order	100.0	102.3	98.7	101.3	103.9	107.7	105.1	110.8	111.7	113.4
3rd order	100.0	103.8	102.9	107.4	113.7	126.1	124.0	135.3	137.2	141.4
4th order	100.0	108.9	117.2	117.8	119.6	129.5	128.3	149.7	155.2	160.1
5th and higher	100.0	96.1	94.4	99.2	104.5	118.2	109.9	126.0	133.3	151.1

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

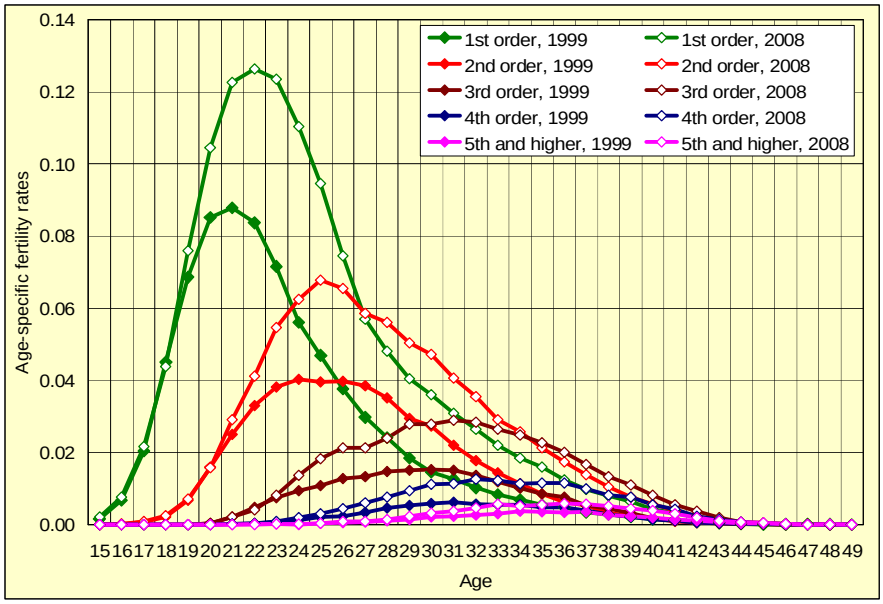
These structural differences are not necessarily the product of recent development of fertility. They were observable already earlier and the developmental changes registered during the period between 1999 and 2008 did not influence them significantly. The growth of fertility was not only universal but also relatively proportional and therefore the discussed relative structure of fertility according to birth order did not change principally.

Due to more intensive growth of higher order fertility in both subpopulations the representation of the first and second birth orders slightly decreased while the other remaining birth orders increased. If the TFR of the first and second birth orders were 49.7 % and 30.5 % respectively in urban settlements and 35.7 % and 28.2 % in rural areas as registered by official statistics in 1999 then the corresponding numbers nine years later were 47.6 % and 29.5 % respectively in the first category of settlements and 33.8 % and 24.8 % respectively in the second category. So, we can see that in urban areas the first and second birth orders contribute mainly to the final level of fertility rate, while in rural areas the higher birth orders contribution is significantly higher. Therefore, in urban areas stronger orientation to have first and second child is observable since 1999 while in rural areas population had maintained tradition to have larger families.

Variability in the number of children being higher in rural areas and lower in urban areas could be connected with different factors. Families, especially young families in urban areas are carefully planning pregnancy due to much worse housing conditions. Housing in urban areas is generally much more expensive in comparison with rural areas. Shortage of places in public kindergartens and high costs of private childcare facility centers also represent a strong obstacle to having more children. These and many other circumstances influence spouses living in urban areas to plan and regulate their fertility more carefully than those living in rural settlements. On the contrary, in rural areas where space is more abundant, children entail less effort from their parents, they do not have to be continuously watched as in urban areas and they cause less disturbance for the parents as they have more place to play. This kind of variations in the daily life, and other much more important factors such as different socio-economic developments result in different number of children by the type of settlement.

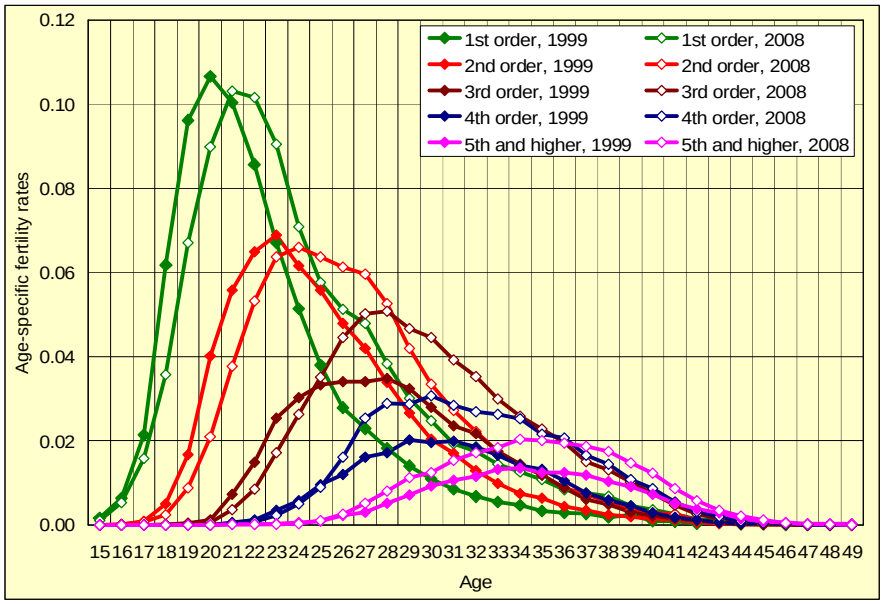
The frequency curves showing distribution of fertility intensities by age of mother and birth orders in 1999 and 2008 (Fig. 20 and 21) illustrate very well the character and scale of changes within those nine years. In both cases one can see ageing of fertility. In urban subpopulation it was the consequence of principal increase of fertility intensities in higher ages (ageing from the end) while in rural subpopulation this ageing was caused by the overall shift of the distribution curve into higher age (ageing from the beginning as well as from the end) in the case of the first three birth orders. The visible differences in the curves referring to the first four birth orders can be interpreted as noticeable differentiation of rural females according to their reproductive behavior into two distinct groups.

Fig. 20 – Changes in age and birth order specific fertility rates in urban areas, 1999 and 2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 21 - Changes in age and birth order specific fertility rates in rural areas, 1999 and 2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Both these groups seem to be delivering children according to more or less traditional schemes but with a smaller time shift in the case of younger generations of mothers than by older generations, those who were in ages of intensive reproduction or entered them during the period of deep economic and social depression.

Generally earlier motherhood in rural areas is directly related to lower age at marriage. The average rural woman gets married earlier than the average woman living in urban environment. This is one of the effects of different approach to higher education. Participation in tertiary education is relatively very high among both rural and urban young females in Kazakhstan; however, rural females are more frequently studying in a combined form which gives opportunity to attend the university twice a year only. There are also higher proportions of females who have no opportunity to participate in tertiary education and are getting married immediately after finishing school in rural areas. Earlier marriage leads to earlier motherhood and consequently to higher number of children which is clearly observable among rural women. On the other hand, significantly increased average time spent by them in tertiary education shifts fertility of the first three or even four birth orders into higher ages.

Educational behavior of young urban females is traditionally different. They are not only trying to attain higher education attending school daily but they more frequently study further to obtain a master or doctoral degree. Urban women are also more intensively trying to be independent through making a career and seeking more or less equal rights alongside with men in comparison with rural women. To achieve these goals they have to make a great effort which in turn affects their family life and consequently also their reproductive behavior.

Indicator of fertility timing illustrates the intensity of ongoing transition to later-childbearing pattern (Tab.10). During nine years of observation the mean age of mothers at first childbearing increased by more than 1.2 years in urban areas (from 23.77 to 25.03 years) and by 1.8 years in rural areas (from 22.91 to 24.77 years). Children of the third and higher birth orders were delivered mostly by mothers aged 30 and over. So, as it can be seen, even higher increase in the mean age of mothers at all births occurred in rural areas the age at motherhood still remained lower among rural women.

Tab. 10 - Mean age of mother at childbirth by place of residence, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Urban										
All births	26.41	26.69	26.86	27.10	27.22	27.45	27.56	27.70	27.75	27.80
1st order	23.77	24.02	24.15	24.33	24.42	24.44	24.56	24.66	24.83	25.03
2nd order	27.31	27.57	27.83	28.05	28.16	28.34	28.40	28.44	28.53	28.37
3rd order	30.51	30.89	31.12	31.34	31.58	31.75	31.92	32.01	32.10	31.92
4th order	32.76	32.91	33.15	33.29	33.34	33.61	33.78	33.86	33.92	33.82
5th and higher	35.46	35.69	35.49	35.70	35.61	35.87	35.89	36.01	35.85	35.73
Rural										
All births	26.59	26.77	26.98	27.21	27.42	27.66	27.87	28.10	28.25	28.39
1st order	22.91	23.08	23.20	23.32	23.69	23.73	23.88	23.95	24.29	24.77
2nd order	25.65	25.74	25.98	26.06	26.22	26.39	26.63	26.77	27.02	27.12
3rd order	28.97	29.23	29.45	29.63	29.73	29.89	30.13	30.22	30.38	30.48
4th order	31.62	31.74	31.91	31.99	32.08	32.22	32.46	32.53	32.58	32.54
5th and higher	35.16	35.32	35.26	35.21	35.19	35.29	35.37	35.32	35.35	35.29

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

Quartiles already used in the part devoted to analysis of fertility in Kazakhstan not differentiated territorially allow us more detailed insight into characteristic features of fertility age structure and its development. Comparison of quartiles, the values of median representing the middle quartile as well as lower and upper quartiles (Tab.11) confirms that rural fertility in general and by the fist, second, third and fourth parity was generally younger and concentrated in a narrower age interval in 1999. However, along with the transformation of fertility age structure expressed by the growth of median age the last mentioned regularity has started to disappear.

Regardless the fact that rural women have delayed their entry into motherhood they deliver children relatively earlier in comparison with women living in urban areas. The age at which childbearing commences is an important determinant of the overall level of fertility as well as the health and welfare of the mother and child. Early initiation into childbearing lengthens the reproductive period and, subsequently increases fertility. In some societies, postponement of first births due to an increase in age at marriage has contributed to the overall fertility decline. This kind of explanation could be referred to women living in urban areas who get married relatively later. In

Tab. 11 - Age distribution of fertility by place of residence, 1999-2008 selected years

	Urban			Rural		
	Lower quartile	Median	Upper quartile	Lower quartile	Median	Upper quartile
1999						
All births	22.11	25.48	30.03	22.10	25.55	30.28
1st order	20.56	22.77	25.91	20.05	21.92	24.62
2nd order	23.87	26.80	30.20	22.52	24.85	27.95
3rd order	27.00	30.30	33.68	25.57	28.46	31.82
4th order	29.58	32.61	35.92	28.43	31.33	34.53
5th and higher	32.50	35.49	38.41	31.96	35.04	38.27
2004						
All births	22.91	26.70	31.36	23.27	26.67	30.53
1st order	21.13	23.40	26.65	20.88	22.94	25.57
2nd order	24.86	27.86	31.40	23.32	25.53	28.74
3rd order	28.28	31.62	35.08	26.32	29.38	32.93
4th order	30.24	33.65	36.92	28.86	32.00	35.21
5th and higher	32.83	36.09	39.03	32.15	35.44	38.32
2008						
All births	23.26	26.88	31.87	23.80	27.80	32.40
1st order	21.47	23.98	27.54	21.20	23.45	27.35
2nd order	24.68	27.69	31.54	23.77	26.47	29.67
3rd order	28.26	31.76	35.39	27.06	29.88	33.49
4th order	30.47	33.74	37.13	29.08	32.15	35.71
5th and higher	32.76	35.84	38.79	32.17	35.31	38.41

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

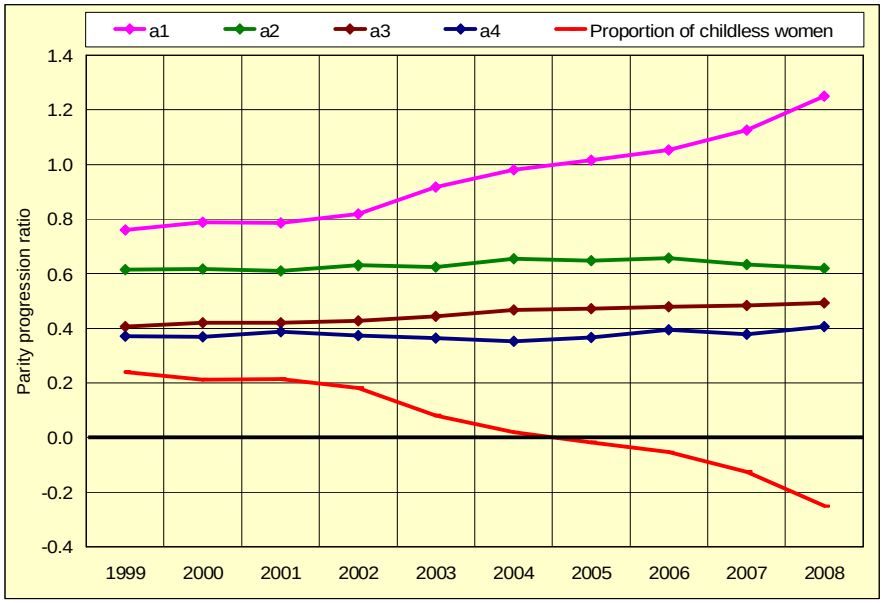
addition, most women in Kazakhstan now practice family planning with regard not only to the number of children but also the timing of births, which could be frequently observed in both subpopulations and even more frequently among women living in urban areas.

Analysis of fertility by parity of children born especially in time of sweeping changes represents an important approach to understanding the mechanism and stability of overall fertility changes. Regardless described earlier limitations of indicators based on reduced rates and period perspective of analysis the parity progression ratios and developments of their values are used to complete the detailed insight into recent dynamics of fertility developments in rural and urban settlements of Kazakhstan.

In urban areas the parity progression ratio values underwent rapid change (Fig.22). The already mentioned scale and duration of massive postponements of maternity among Kazakhstani women and those living in urban settlements in particular led to accumulation of high reproductive potential. Sound developments of national economy and induced growth of living standard of population during the 2000s released this potential in a relatively short period of time. Realization

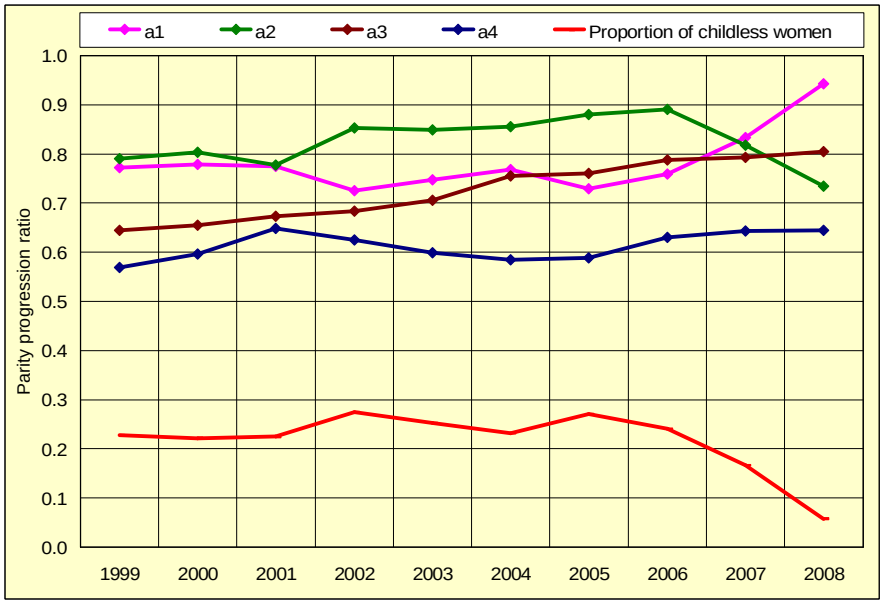
of the potential and reduced postponement of maternity among younger generation resulted in rapid growth of general as well as parity specific fertility. Parity progression ration for the birth order zero exceed the level 1.00 already in 2005 and in 2008 reached 1.25 births of the first parity per female during her reproductive age. The development of other probabilities of parity progression ratios during these years were stable and remained almost at the same level as it was in 1999.

Fig. 22 – Parity progression ration in urban areas, 1999-2008



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

***Fig. 23* - Parity progression ration in rural areas, 1999-2008**



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

In rural areas this kind of extreme changes in probability of having the first birth order child did not occur due to substantially lower postponement of maternity in previous one and a half decade. Parity progression ratios of first, third and fourth orders increased in 2008 while probability of second order decreased and stabilized at slightly lower level than in 1999 (Fig.23). Proportion of childless women showed logically decreasing trend due to increase of probability of having first child. Parity progression ratios of all birth orders experienced some fluctuations in their development over the period since various reproduction strategies were adopted in Kazakhstani rural areas and the values of the parity specific TFR therefore were much closer to each other than in urban settlements.

From studies undertaken in advanced societies two opposite viewpoints emerged to explain the urban-rural differential in fertility. The first view is based on research by Beegle (1966), Bogue (1969), and Johnson, Stokes and Warland (1978) and suggests that variations between localities can be explained in terms of the socio-economic characteristics of people residing in different areas. On the contrary, studies from European countries (Andorka 1978, 1982) indicate that urban-rural differentials are real, that rural residence *per se* is important and is a direct determinant of fertility. Explicitly or implicitly these two opposite viewpoints relate to fertility differentiation between places of residence. The direct influence of habitat on family size, socio-economic, compositional factors of the residents and the selective migration of particular age groups determine the difference between urban and rural fertilities.

Presented below analytical results are based on comparison of natality and fertility levels and structures and their developments in two different areas, rural and urban, during the nine-year period of social and economic growth in Kazakhstan. Analysis demonstrates that this period was transitional from both the reproductive behavior perspective and from the perspective of the social and economic development. Convergence of the examined reproductive patterns seems to be more imaginary rather than apparent since it concerns predominantly the aggregate indicators and their values than detailed structural characteristics of fertility. Specifically, behind the observed convergence of values of the most important aggregate indicator of fertility, the TFR, one can find diverse structures and trajectories of their development in rural and urban areas. The development of values of more detailed (semi-aggregated and elementary) fertility characteristics´ during the period of observation speaks more about particular preservation of differences rather than about real convergence, about preservation of reproductive “distance(s)” between rural and urban sub-populations in Kazakhstan.

9.2 Inter-ethnic differentiation

When rapid economic growth is accompanied by demographic and social change, fertility behaviors of socially excluded groups may become a cause for concern, and divergent fertility behaviors by region and ethnicity start to attract more attention (Agadjanian, 1999). Distinctive way of life, cultural dissimilarities and different value orientation are related to populations of different ethnic origin and determine their demographic behavior to a significant extent.

All together about 130 different ethnic groups live on the territory of the Republic of Kazakhstan. Major part of Kazakhstani population consists of two large ethnic groups, Kazakhs and Russians. These groups made up about 59 % and 26 % of the population of Kazakhstan respectively as estimated by the end of year 2008. Five other relatively numerous ethnic groups are Uighurs, Uzbeks, Germans, Ukrainians and Tatars and together they comprised about 10% of total population. Remaining more than 120 nationalities represented approximately 5% of population. Till now each ethnic community has maintained its own socio-cultural ways of life, and is often segregated to some extent by place of residence, education and occupation.

Ethnic groups are unevenly dispersed throughout Kazakhstan and we can clearly identify areas densely populated by Turkic groups mostly living in the South (Atyrau, Qyzylorda), South-West (Aktobe, Almaty, Zhambyl) and West (Mangistau) regions. Population of European origins is mostly predominant in the North-East (Akmola, Kostanay) and Central (Karaganda, Pavlodar) Kazakhstan regions.

Scholars studying ethnic differentiation of demographic behavior and reproduction in Kazakhstan usually adopt different ethnic classifications. Ethnic groups of Kazakhstan are most frequently divided into Turkic and Slavic, titular or non-titular, European and non-European ones. However a more practical way seems to be studying ethnic groups according to similarities of their demographic characteristics and their developments. In this thesis we are going to focus on analysis of structural similarities and common trends in fertility developments of two major ethnic groups – Turkic and European ones. The Turkic group which includes Kazakhs, Uzbeks, Uighurs and Tatars displays generally higher birth rates than members of the European ethnic group, i.e. Russians, Germans and Ukrainians. In some parts of the discussion presented further below, however, the populations corresponding to two major ethnic groups, Kazakhs and Russians, are analyzed separately from other ethnically defined sub-populations.

9.2.1 Natality and changing age structure of females in reproductive age

The number of live births during the observed period increased in all ethnic groups, and especially among Turkic ones. The highest increase was displayed by Kazakhs where the total number of births increased almost by four fifths (81.1 %) between 1999 and 2008 (Tab.12). If in the year 1999

Kazakhs represented 68.7 % of all newly born, then nine years later their share was more than six percentage points higher (75.3 %). An interesting trend can be observed in the relative structure of births by parity. While at the national level one can see decreasing proportion of the first order births, in Kazakh population its value significantly increased. This change happened on the account of the second order and fifth plus higher order births as well as less dynamic growth of the third and fourth ones proportions.

Tab. 12 – Live births by birth order, Kazakhs, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	140,476	147,383	147,066	152,132	166,884	185,681	192,028	211,432	226,735	254,347
1st order	55,646	58,424	59,257	59,845	66,806	72,894	76,487	83,037	91,630	105,276
2nd order	41,306	43,075	41,744	44,084	48,053	52,936	54,789	59,597	62,194	68,676
3rd order	23,787	25,226	24,845	26,507	29,247	33,786	34,757	38,332	40,335	43,873
4th order	11,865	12,999	13,873	14,071	14,600	16,519	16,816	19,938	21,271	23,264
5th and higher	7,872	7,659	7,347	7,625	8,178	9,546	9,179	10,528	11,305	13,258
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	39.6	39.6	40.3	39.3	40.0	39.3	39.8	39.3	40.4	41.4
2nd order	29.4	29.2	28.4	29.0	28.8	28.5	28.5	28.2	27.4	27.0
3rd order	16.9	17.1	16.9	17.4	17.5	18.2	18.1	18.1	17.8	17.2
4th order	8.4	8.8	9.4	9.2	8.7	8.9	8.8	9.4	9.4	9.1
5th and higher	5.6	5.2	5.0	5.0	4.9	5.1	4.8	5.0	5.0	5.2
Development index (1999=100)										
All births	100.0	104.9	104.7	108.3	118.8	132.2	136.7	150.5	161.4	181.1
1st order	100.0	105.0	106.5	107.5	120.1	131.0	137.5	149.2	164.7	189.2
2nd order	100.0	104.3	101.1	106.7	116.3	128.2	132.6	144.3	150.6	166.3
3rd order	100.0	106.0	104.4	111.4	123.0	142.0	146.1	161.1	169.6	184.4
4th order	100.0	109.6	116.9	118.6	123.1	139.2	141.7	168.0	179.3	196.1
5th and higher	100.0	97.3	93.3	96.9	103.9	121.3	116.6	133.7	143.6	168.4

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

The number of newly born Uzbeks grew with lower intensity than the same indicator value for Kazakhs between 1999 and 2008. It increased by about 58.1 % (Tab.13). Interestingly, among Uzbeks, the number of the first parity births related to all births significantly increased due to lower proportion of the second and third births. Also the proportion of the highest order births category grew substantially among Uzbeks unlike among Kazakhs. Due to higher structural weight of higher birth order children it is realistic to expect that total fertility in Uzbek population will be higher than among Kazakh women.

Tab. 13 – Live births by birth order, Uzbeks, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	9,520	9,003	9,207	9,281	10,231	11,463	11,534	12,268	13,392	15,047
1st order	2,990	2,781	2,936	2,958	3,464	3,825	3,973	4,034	4,368	5,126
2nd order	2,696	2,513	2,471	2,419	2,660	3,005	2,979	3,339	3,430	3,630
3rd order	2,145	2,062	2,091	2,107	2,156	2,565	2,422	2,610	2,809	3,102
4th order	1,173	1,181	1,280	1,316	1,433	1,449	1,530	1,669	1,970	2,155
5th and higher	516,0	466,0	429,0	481,0	518,0	619,0	630,0	616,0	815,0	1,034
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	31.4	30.9	31.9	31.9	33.9	33.4	34.4	32.9	32.6	34.1
2nd order	28.3	27.9	26.8	26.1	26.0	26.2	25.8	27.2	25.6	24.1
3rd order	22.5	22.9	22.7	22.7	21.1	22.4	21.0	21.3	21.0	20.6
4th order	12.3	13.1	13.9	14.2	14.0	12.6	13.3	13.6	14.7	14.3
5th and higher	5.4	5.2	4.7	5.2	5.1	5.4	5.5	5.0	6.1	6.9
Development index (1999=100)										
All births	100.0	94.6	96.7	97.5	107.5	120.4	121.2	128.9	140.7	158.1
1st order	100.0	93.0	98.2	98.9	115.9	127.9	132.9	134.9	146.1	171.4
2nd order	100.0	93.2	91.7	89.7	98.7	111.5	110.5	123.9	127.2	134.6
3rd order	100.0	96.1	97.5	98.2	100.5	119.6	112.9	121.7	131.0	144.6
4th order	100.0	100.7	109.1	112.2	122.2	123.5	130.4	142.3	167.9	183.7
5th and higher	100.0	90.3	83.1	93.2	100.4	120.0	122.1	119.4	157.9	200.4

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

Among Uighurs, another ethnic group of Turkic origin, natality increased between 1999 and 2008 by 74.4% (Tab.14). This growth was higher than displayed by Uzbek ethnic group, however lower than in the case of Kazakhs. Unlike Kazakhs or Uzbeks, the proportions of first birth order among Uighurs decreased slightly alongside with the second birth order, while remaining third and higher birth orders increased substantially especially in the very end of the observed period, in the year 2008.

Tab. 14 – Live births by birth order, Uighurs, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	3,472	3,882	3,587	3,744	4,268	4,661	4,684	4,806	5,424	6,054
1st order	1,518	1,687	1,622	1,645	1,804	1,924	1,939	2,029	2,285	2,550
2nd order	1,141	1,243	1,094	1,169	1,311	1,469	1,443	1,452	1,649	1,717
3rd order	568,0	687,0	614,0	633,0	814,0	900,0	911,0	891,0	1,025	1,187
4th order	177,0	210,0	190,0	218,0	277,0	286,0	317,0	350,0	349,0	452,0
5th and higher	68,0	55,0	67,0	79,0	62,0	82,0	74,0	84,0	116,0	148,0

Tab. 14 – Live births by birth order, Uighurs, 1999-2008… continue

Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	43.7	43.5	45.2	43.9	42.3	41.3	41.4	42.2	42.1	42.1
2nd order	32.9	32.0	30.5	31.2	30.7	31.5	30.8	30.2	30.4	28.4
3rd order	16.4	17.7	17.1	16.9	19.1	19.3	19.4	18.5	18.9	19.6
4th order	5.1	5.4	5.3	5.8	6.5	6.1	6.8	7.3	6.4	7.5
5th and higher	2.0	1.4	1.9	2.1	1.5	1.8	1.6	1.7	2.1	2.4
Development index (1999=100)										
All births	100.0	111.8	103.3	107.8	122.9	134.2	134.9	138.4	156.2	174.4
1st order	100.0	111.1	106.9	108.4	118.8	126.7	127.7	133.7	150.5	168.0
2nd order	100.0	108.9	95.9	102.5	114.9	128.7	126.5	127.3	144.5	150.5
3rd order	100.0	121.0	108.1	111.4	143.3	158.5	160.4	156.9	180.5	209.0
4th order	100.0	118.6	107.3	123.2	156.5	161.6	179.1	197.7	197.2	255.4
5th and higher	100.0	80.9	98.5	116.2	91.2	120.6	108.8	123.5	170.6	217.6

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

The lowest increase in natality among Turkic ethnic groups was displayed by Tatars. In their case the total number of births increased only by 41.9% between 1999 and 2008 (Tab.15). It could be also clearly seen that the change in their birth order specific proportions differ from all other Turkic ethnic groups, since the increase was observed only in the first birth order while the proportions of other remaining birth orders decreased between the initial and the final year of the period.

Tab. 15 – Live births by birth order, Tatars, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	2,378	2,248	2,136	2,355	2,486	2,763	2,736	2,913	3,139	3,375
1st order	1,284	1,237	1,156	1,273	1,380	1,477	1,522	1,591	1,744	1,903
2nd order	745,0	703,0	686,0	756,0	768,0	879,0	851,0	940,0	941,0	1,027
3rd order	221,0	194,0	181,0	225,0	243,0	297,0	256,0	264,0	338,0	303,0
4th order	81,0	74,0	76,0	74,0	53,0	72,0	69,0	87,0	84,0	90,0
5th and higher	47,0	40,0	37,0	27,0	42,0	38,0	38,0	31,0	32,0	52,0
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	54.0	55.0	54.1	54.1	55.5	53.5	55.6	54.6	55.6	56.4
2nd order	31.3	31.3	32.1	32.1	30.9	31.8	31.1	32.3	30.0	30.4
3rd order	9.3	8.6	8.5	9.6	9.8	10.7	9.4	9.1	10.8	9.0
4th order	3.4	3.3	3.6	3.1	2.1	2.6	2.5	3.0	2.7	2.7
5th and higher	2.0	1.8	1.7	1.1	1.7	1.4	1.4	1.1	1.0	1.5

Tab. 15 – Live births by birth order, Tatars, 1999-2008… continue

	Development index (1999=100)									
All births	100.0	94.5	89.8	99.0	104.5	116.2	115.1	122.5	132.0	141.9
1st order	100.0	96.3	90.0	99.1	107.5	115.0	118.5	123.9	135.8	148.2
2nd order	100.0	94.4	92.1	101.5	103.1	118.0	114.2	126.2	126.3	137.9
3rd order	100.0	87.8	81.9	101.8	110.0	134.4	115.8	119.5	152.9	137.1
4th order	100.0	91.4	93.8	91.4	65.4	88.9	85.2	107.4	103.7	111.1
5th and higher	100.0	85.1	78.7	57.4	89.4	80.9	80.9	66.0	68.1	110.6

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

The dissimilar distribution of changes by birth order signals that the differences in fertility patterns were probably present not only during the period of observation but also in the preceding period when the postponement of maternity was realized in all four ethnic subpopulations being just discussed. Kazakh, Uzbek and Tatar females probably postponed the parenthood in the absolute sense of this word first of all, meanwhile Uighurs concentrated mostly on reduction of the number of children in family during economically difficult times. In fact, there was very likely also different approach to reduction of family size through postponement of higher order births. Kazakhs seemingly reduced more the third and especially fourth births, Uzbeks fourth and higher order births and Uighurs probably postponed all the births higher than the second order and this postponement or maybe better its realization was definitely more sound that the postponements presented by Kazakhs and Uzbeks. Structural changes in natality among Tatars did not signal any other significant compensation of previous postponements than that reflected in the increase of the first parity born number and its proportion in the same time.

Increasing natality was also observed among selected members of the European group, however only during particular times of the observed period. The number of first order births among Russians decreased moderately reaching its minimum in 2001, than it started to grow getting above the initial level in the year 2003. The final increase of total live births was 26.2% in the year 2008 (Tab.16). The relative structure of births by parity developed differently among Russians compared with the ethnic groups discussed before. Proportions of the first order births and births of the fourth and higher parities have declined while the proportion of the second and third order births significantly increased. This trend represents another type of postponement strategy when reduction affected mostly the second and third order children. The children of higher orders were undoubtedly postponed as well, but these "losses" will probably never be compensated because the traditional model of Russian females reproductive behaviour has been transforming in parallel with the discussed above postponements and their realization.

Tab. 16 – Live births by birth order, Russians, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	38,904	38,502	37,587	38,762	41,763	43,900	43,772	44,984	46,590	49,103
1st order	23,565	23,104	22,545	22,753	24,588	25,604	25,364	25,851	26,867	28,702
2nd order	11,075	11,260	11,146	12,060	12,757	13,751	13,815	14,394	14,814	15,161
3rd order	2,688	2,697	2,629	2,708	3,053	3,275	3,274	3,429	3,573	3,857
4th order	907,0	819,0	773,0	751,0	830,0	771,0	867,0	849,0	856,0	918,0
5th and higher	669,0	622,0	494,0	490,0	535,0	499,0	452,0	461,0	480,0	465,0
Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	60.6	60.0	60.0	58.7	58.9	58.3	57.9	57.5	57.7	58.5
2nd order	28.5	29.2	29.7	31.1	30.5	31.3	31.6	32.0	31.8	30.9
3rd order	6.9	7.0	7.0	7.0	7.3	7.5	7.5	7.6	7.7	7.9
4th order	2.3	2.1	2.1	1.9	2.0	1.8	2.0	1.9	1.8	1.9
5th and higher	1.7	1.6	1.3	1.3	1.3	1.1	1.0	1.0	1.0	0.9
Development index (1999=100)										
All births	100.0	99.0	96.6	99.6	107.3	112.8	112.5	115.6	119.8	126.2
1st order	100.0	98.0	95.7	96.6	104.3	108.7	107.6	109.7	114.0	121.8
2nd order	100.0	101.7	100.6	108.9	115.2	124.2	124.7	130.0	133.8	136.9
3rd order	100.0	100.3	97.8	100.7	113.6	121.8	121.8	127.6	132.9	143.5
4th order	100.0	90.3	85.2	82.8	91.5	85.0	95.6	93.6	94.4	101.2
5th and higher	100.0	93.0	73.8	73.2	80.0	74.6	67.6	68.9	71.7	69.5

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

The number of live born children among Germans shows the lowest increase among all discussed ethnic groups during the nine-year period in question. This change was almost hardly noticeable when it reached 1.5 % due to relatively very high increase of natality during the year 2008. In the remaining years of the period the number of live births delivered by females of German ethnicity was well below the initial year level (Tab.17).

Tab. 17 – Live births by birth order, Germans, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	4,736	4,365	4,145	4,024	4,008	4,203	4,137	4,194	4,260	4,809
1st order	2,848	2,622	2,540	2,359	2,338	2,404	2,357	2,335	2,408	2,772
2nd order	1,260	1,205	1,130	1,165	1,199	1,298	1,303	1,371	1,340	1,412
3rd order	358,0	329,0	300,0	328,0	302,0	348,0	326,0	348,0	356,0	439,0
4th order	142,0	104,0	87,0	92,0	97,0	76,0	86,0	79,0	94,0	123,0
5th and higher	128,0	105,0	88,0	80,0	72,0	77,0	65,0	61,0	62,0	63,0

Tab. 17 – Live births by birth order, Germans, 1999-2008… continue

Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	60.1	60.1	61.3	58.6	58.3	57.2	57.0	55.7	56.5	57.6
2nd order	26.6	27.6	27.3	29.0	29.9	30.9	31.5	32.7	31.5	29.4
3rd order	7.6	7.5	7.2	8.2	7.5	8.3	7.9	8.3	8.4	9.1
4th order	3.0	2.4	2.1	2.3	2.4	1.8	2.1	1.9	2.2	2.6
5th and higher	2.7	2.4	2.1	2.0	1.8	1.8	1.6	1.5	1.5	1.3
Development index (1999=100)										
All births	100.0	92.2	87.5	85.0	84.6	88.7	87.4	88.6	89.9	101.5
1st order	100.0	92.1	89.2	82.8	82.1	84.4	82.8	82.0	84.6	97.3
2nd order	100.0	95.6	89.7	92.5	95.2	103.0	103.4	108.8	106.3	112.1
3rd order	100.0	91.9	83.8	91.6	84.4	97.2	91.1	97.2	99.4	122.6
4th order	100.0	73.2	61.3	64.8	68.3	53.5	60.6	55.6	66.2	86.6
5th and higher	100.0	82.0	68.8	62.5	56.3	60.2	50.8	47.7	48.4	49.2

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

Relative structure of birth orders of this ethnic group changed in the same way as in the case of Russian females. Proportions of 1st, 4th and 5th and higher birth orders decreased while the 2nd and 3rd birth orders increased in the year 2008 compared to the situation as monitored by the official statistics in 1999.

Natality among Ukrainian females was rather unique in comparison with that among German and Russian females. Its development displayed almost no similarity with natality changes among Russian females, although it had in common with German females the basic trend and final size of the change observed. The number of newly born Ukrainians grew up only by 2.9%, mainly due to its principal increase in the last year of observation (Tab.18). Completely different from situations previously described, however, were the changes in the structure by birth order. The previous postponement and its realization concerned namely the first birth order and partially also the third one.

Tab. 18 – Live births by birth order, Ukrainians, 1999-2008

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Absolute numbers										
All births	5,121	4,891	4,675	4,590	4,832	4,901	4,749	4,898	4,930	5,267
1st order	2,632	2,541	2,390	2,365	2,450	2,524	2,441	2,598	2,607	2,896
2nd order	1,699	1,599	1,610	1,529	1,622	1,662	1,622	1,596	1,630	1,659
3rd order	480,0	481,0	443,0	460,0	506,0	484,0	468,0	470,0	499,0	519,0
4th order	170,0	154,0	138,0	133,0	156,0	135,0	128,0	139,0	110,0	123,0
5th and higher	140,0	116,0	94,0	103,0	98,0	96,0	90,0	95,0	84,0	70,0

Tab. 18 – Live births by birth order, Ukrainians, 1999-2008… continue

Proportion (per cent)										
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	51.4	52.0	51.1	51.5	50.7	51.5	51.4	53.0	52.9	55.0
2nd order	33.2	32.7	34.4	33.3	33.6	33.9	34.2	32.6	33.1	31.5
3rd order	9.4	9.8	9.5	10.0	10.5	9.9	9.9	9.6	10.1	9.9
4th order	3.3	3.1	3.0	2.9	3.2	2.8	2.7	2.8	2.2	2.3
5th and higher	2.7	2.4	2.0	2.2	2.0	2.0	1.9	1.9	1.7	1.3
Development index (1999=100)										
All births	100.0	95.5	91.3	89.6	94.4	95.7	92.7	95.6	96.3	102.9
1st order	100.0	96.5	90.8	89.9	93.1	95.9	92.7	98.7	99.1	110.0
2nd order	100.0	94.1	94.8	90.0	95.5	97.8	95.5	93.9	95.9	97.6
3rd order	100.0	100.2	92.3	95.8	105.4	100.8	97.5	97.9	104.0	108.1
4th order	100.0	90.6	81.2	78.2	91.8	79.4	75.3	81.8	64.7	72.4
5th and higher	100.0	82.9	67.1	73.6	70.0	68.6	64.3	67.9	60.0	50.0

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

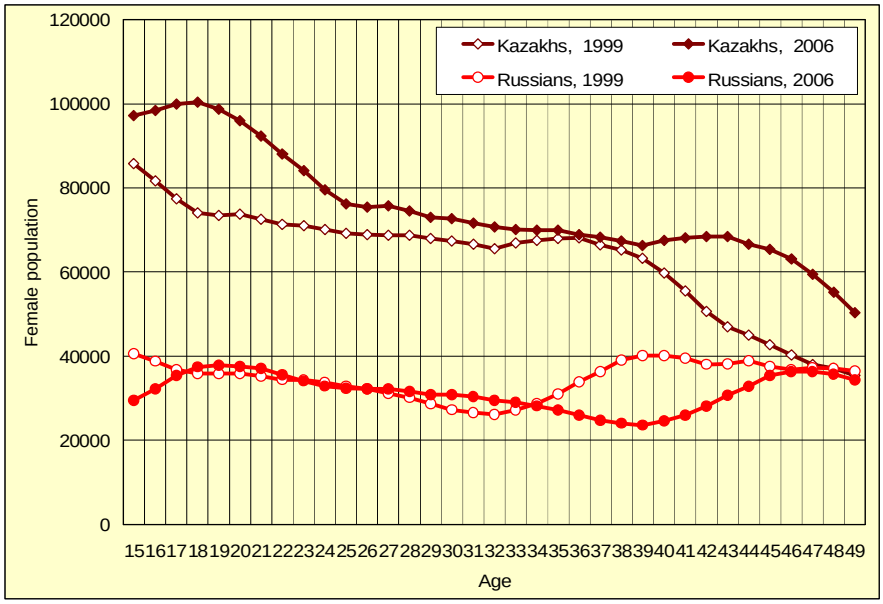
Natality among ethnic groups discussed above developed rather differently during the years of observation. Major increase in number of births occurred among Turkic ethnic groups. The number of births observed among European ethnic groups was decreasing more or less during the whole period and only recently reached the level above the initial one in 1999. In Russian ethnic group developmental trend changed earlier and the final level of natality was substantially higher than in the year 1999, in Ukrainian and German ethnic groups the change started later and the finally reached natality level was only insignificantly higher than the initial one. The obvious differences among ethnic groups are also observable in the proportions of their birth orders. While higher proportions of high birth orders are more common among women of Turkic origin, the highest proportion of the first and second birth orders which comprise about 85% of all births is typical among women of European origin. This kind of variations in natality among ethnic groups was clearly observable in 1999 and nine years later it remained or even became stronger.

To what extent the observed differentiation in natality developments is a manifestation of reproductive behaviour and its development differentiations and to what extent it is an expression of changes in population size and structure will be analysed and discussed in the following section of the thesis.

As it was already mentioned, the number of births is a function of the number and age distribution of females in reproductive age (15-49 years old). The distinct historical experiences of ethnic groups are reflected in varying composition of their female population. The age profiles clearly display substantially different demographic histories of these seven ethnic groups (Fig.24 and Fig.25). Not only sweeping historical changes in natality but also different participation in mass migrations, both emigration as well as immigration, during the 1990´s and in the beginning of this decade shaped particular age structures of females between 15 and 49 years of age. As a result, the

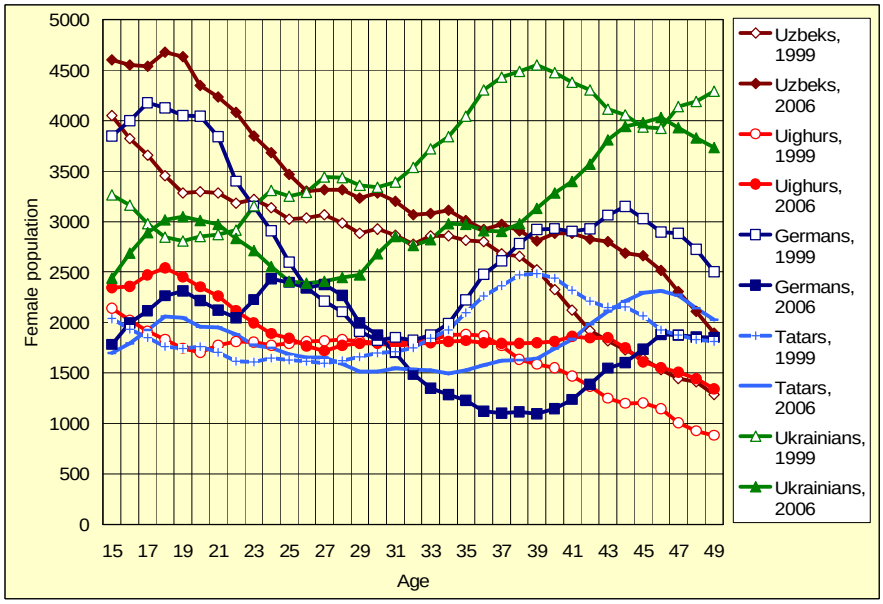
ethnoses of Turkic group demonstrated growth of the contingents of potential mothers while the group of European ethnoses in question reported dynamic decrease of the contingents of potential mothers. The most significant decrease in the number of potential mothers is evident among Germans as well as among Ukrainians who participated in mass emigrations from Kazakhstan after 1999. On the contrary, the in-flow of ethnic Kazakhs (Oralmans) resulted in the significant growth of titular ethnos including the contingent of potential mothers.

Fig. 24 – Age structure of females in reproductive age by ethnicity, selected years



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 25 - Age structure of females in reproductive age by ethnicity, selected years

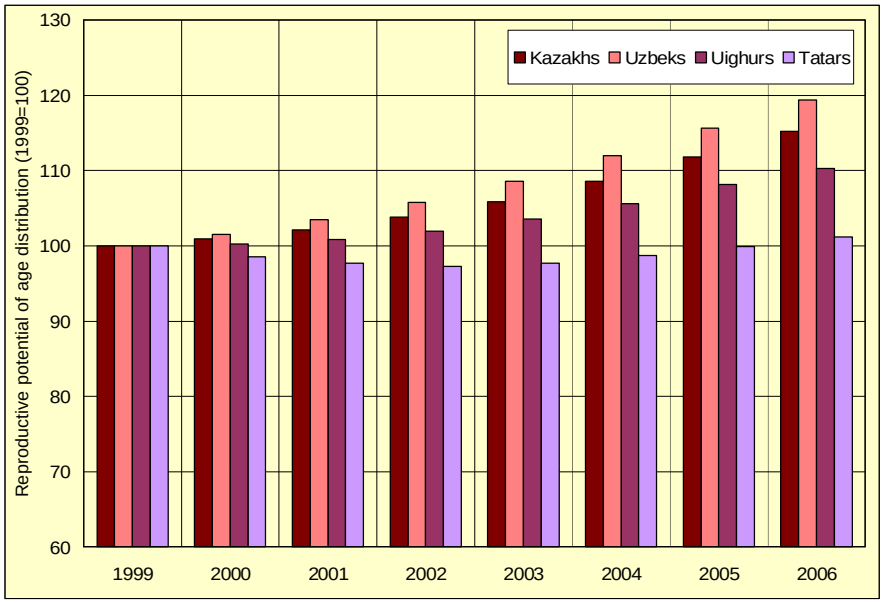


Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

The age distribution of females in reproductive age had changed substantially among particular ethnoses in question. Relative stability was observed only in the case of Russian females. These structural changes, however, should be evaluated in conjunction with fertility distribution by age, i.e. through development of the so called reproductive potential, when one want to discuss these in the context of natality.

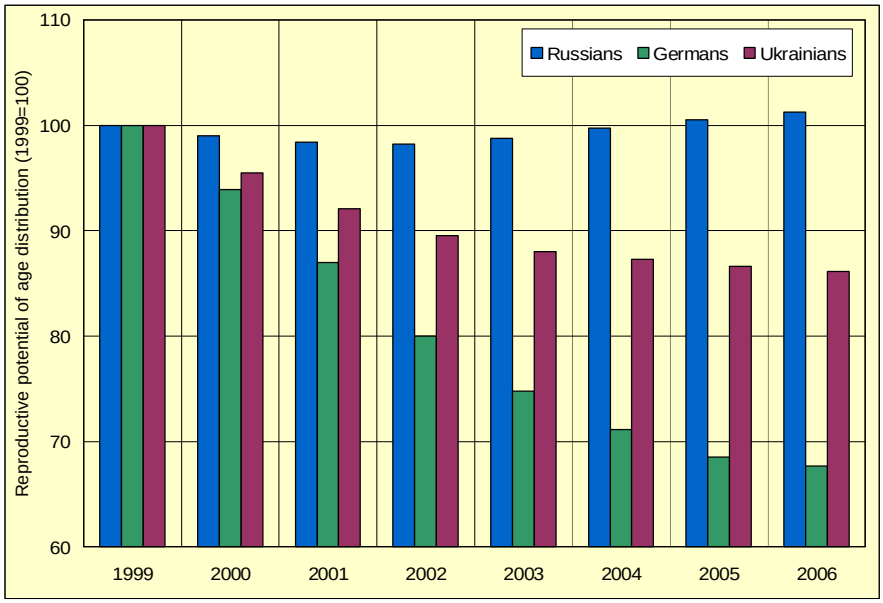
Changes in reproductive potential are affected by the number and age-structure of women in question. Due to analogous changes of the discussed size and age structure of Turkic females excluding Tatars, the reproductive potential of corresponding ethnoses was substantially higher in 2006 than in 1999 (Fig.26, 27). Reproductive potential of females of European origin except Russian ones decreased in general. Only in the case of Russians and Tatars among all the ethnoses discussed the decrease of reproductive potential during the first half of the nine year period was compensated in the second half of the period and in the year 2006 it was slightly higher than in 1999. In other words, if the levels and distributions of fertility would remain the same in 2006 as they were in 1999 then the number of births delivered by Kazakh, Uzbek and Uighur mothers would be higher than in the year 1999 during the entire period, while Russians and Tatars would deliver more children starting only from the year 2005 and the number of children born to Ukrainian and German mothers would be lower by about 13 % and 32 % respectively.

Fig. 26 - Reproductive potential of females in reproductive age by ethnicity, 1999-2006 (ethnospecific ASFR=1999)



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 27 - Reproductive potential of females in reproductive age by ethnicity, 1999-2006 (ethnospecific ASFR=1999)



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Comparison of the number of births with those "potential" ones show that the above mentioned phenomenon of declining or more or less stagnating reproductive potential among some ethnic groups was fully compensated already in the year 2006 due to principally increased level of fertility.

9.2.2 Fertility and its age patterns transformation

The CBR and GFR increased among all ethnic groups during 1999-2006 and the level of these two indicators varies among two ethnic groups being substantially higher among Turkic groups except Tatars (Tab.19). As the CBR is dependent on age-sex structure of population, the standardization was applied to adjust for these influences (Tab.19.). After standardization of CBR the non-standardized CBR remained high in 2006, showing the degree of influence of age-sex structure of population on its level which was not so high. To adjust the GFR, standardization on a common age distribution was also done. The standardized GFR for Turkic group members except Tatars shows higher values than non standardized GFR, while the standardized GFR for European ethnoses is lower than non-standardized one, except Ukrainians in 2006. Therefore, if the age distribution of Kazakhs, Uzbeks, Uighurs and Ukrainians would remain the same as in 1999, the GFR would be higher in 2006 while Russian, German and Tatar women's GFR would display lower level than it was in reality.

Fertility rates also vary widely across the country's ethnic groups (Tab.19). For example, Kazakh and Russian females, members of the two ethnoses who together account for 85 percent of

Kazakhstan's 16.0 million total population and benefit most from the country's economic growth, have total fertility rates of 2.7 and 1.4 births per woman respectively. Meanwhile, minority groups in the country have various total fertility rates among them: Uzbeks-3.4, Uigurs-2.5, Germans-2.0, Tatars-1.7, and Ukrainians-1.8 births per woman.

Total fertility rate among Turkic ethnoses except the Tatars is above replacement level, while among Europeans it was and remained below this level in 2006. The fertility behavior of ethnic groups could be influenced by both structural and cultural determinants. Traditions to have higher number of children and big size families have been historically typical for Turkic group, while among European group more common were smaller sized families. Also, ethnic groups differ by the level of socioeconomic development, including education, employment opportunities, occupational structure, mortality levels, and housing habits (Pyle, 2006). All of these factors have direct or indirect influence on fertility level and patterns.

Tab. 19 – Birth and fertility rate by ethnic groups, 1999-2006

	1999	2000	2001	2002	2003	2004	2005	2006
Kazakhs								
CBR (per 1,000 inhabitants.)	17.5	18.2	17.9	18.2	19.7	21.5	21.8	23.5
Standardized CBR (per 1,000 inhabitants)	17.5	18.4	18.4	19.0	20.8	23.2	24.0	26.4
GFR (per 1,000 females 15-49 years old)	63.6	65.1	63.4	63.9	68.3	74.1	74.7	80.2
Standardized GFR (per 1,000 females 15-49 years old)	63.6	66.0	65.2	66.5	71.7	78.3	78.9	84.6
TFR (per female 15-49 years old)	2.03	2.11	2.09	2.13	2.30	2.52	2.54	2.72
Uzbeks								
CBR (per 1,000 inhabitants.)	25.5	23.6	23.6	23.3	25.2	27.7	27.2	28.3
Standardized CBR (per 1,000 inhabitants)	25.5	23.7	23.8	23.5	25.3	27.6	27.0	27.9
GFR (per 1,000 females 15-49 years old)	100.9	92.5	91.7	89.5	95.7	104.3	102.2	106.0
Standardized GFR (per 1,000 females 15-49 years old)	100.9	94.0	94.4	93.1	100.3	109.3	106.8	110.4
TFR (per female 15-49 years old)	3.10	2.90	2.92	2.88	3.10	3.38	3.32	3.43
Uighurs								
CBR (per 1,000 inhabitants.)	16.4	18.2	16.6	17.1	19.3	20.7	20.5	21.3
Standardized CBR (per 1,000 inhabitants)	16.4	18.3	16.8	17.4	19.7	21.1	20.9	21.0
GFR (per 1,000 females 15-49 years old)	60.4	66.1	59.6	60.8	67.7	72.4	71.5	72.6
Standardized GFR (per 1,000 females 15-49 years old)	60.4	67.5	62.0	64.1	72.3	77.6	76.8	77.3
TFR (per female 15-49 years old)	1.94	2.16	1.99	2.06	2.32	2.49	2.47	2.48
Tatars								
CBR (per 1,000 inhabitants.)	9.6	9.2	8.9	10.0	10.7	11.9	11.9	12.7
Standardized CBR (per 1,000 inhabitants)	9.6	9.2	8.9	9.9	10.5	11.6	11.4	12.0
GFR (per 1,000 females 15-49 years old)	35.4	33.9	32.5	36.1	38.3	42.8	42.8	46.0
Standardized GFR (per 1,000 females 15-49 years old)	35.4	34.0	32.7	36.4	38.5	42.7	41.9	44.3
TFR (per female 15-49 years old)	1.37	1.32	1.26	1.40	1.48	1.64	1.61	1.70

Tab. 19 – Birth and fertility rate by ethnic groups, 1999-2006… continue

Russians								
CBR (per 1,000 inhabitants.)	8.8	8.9	8.8	9.3	10.2	10.9	11.0	11.4
Standardized CBR (per 1,000 inhabitants)	8.8	8.8	8.6	8.9	9.6	10.0	9.9	10.1
GFR (per 1,000 females 15-49 years old)	32.1	32.3	32.1	33.6	36.6	38.9	39.3	40.8
Standardized GFR (per 1,000 females 15-49 years old)	32.1	32.1	31.5	32.6	35.0	36.7	36.3	37.0
TFR (per female 15-49 years old)	1.17	1.18	1.16	1.20	1.30	1.36	1.35	1.38
Germans								
CBR (per 1,000 inhabitants.)	13.9	14.0	14.5	15.4	16.4	18.1	18.4	18.4
Standardized CBR (per 1,000 inhabitants)	13.9	13.6	13.9	14.6	15.7	17.0	17.5	17.7
GFR (per 1,000 females 15-49 years old)	47.3	47.5	49.4	52.7	56.6	63.0	65.0	67.3
Standardized GFR (per 1,000 females 15-49 years old)	47.3	46.4	47.5	49.9	53.6	58.1	59.8	60.3
TFR (per female 15-49 years old)	1.53	1.50	1.55	1.64	1.74	1.93	1.98	2.02
Ukrainians								
CBR (per 1,000 inhabitants.)	9.5	9.4	9.3	9.4	10.2	10.6	10.5	11.0
Standardized CBR (per 1,000 inhabitants)	9.5	9.5	9.5	9.6	10.4	10.7	10.5	11.0
GFR (per 1,000 females 15-49 years old)	39.9	39.6	39.1	39.6	42.6	44.1	43.6	45.9
Standardized GFR (per 1,000 females 15-49 years old)	39.9	40.0	39.7	40.4	43.6	45.0	44.3	46.2
TFR (per female 15-49 years old)	1.60	1.60	1.58	1.60	1.71	1.76	1.73	1.80

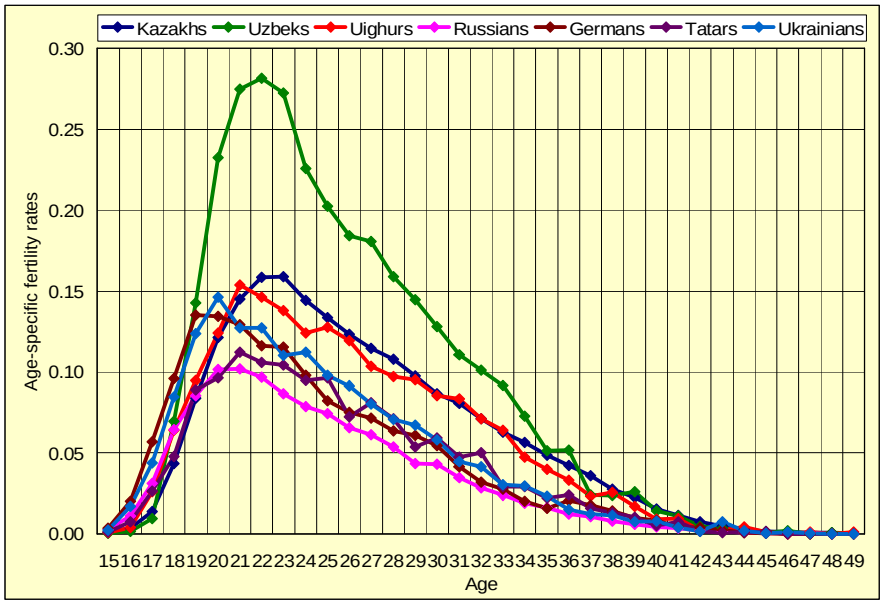
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Standard populations as in 1999

The observed differences in values of aggregated indicators of childbearing intensity among the particular ethnoses remain significant even after application of standardization. This differentiation and its growth are confirmed by existing differences in the ethno-specific values of total fertility rate and their development. For instance, their variation range grew up from 1.93 children per woman in 1999 to 2.05 children per woman in 2006. So the total fertility rate of Uzbek females was two and a half times higher than those of Russian females living in the same country in the same time.

Similar differences among ethnoses can be observed in the age patterns of fertility. The only common denominator of fertility distributions by age in the beginning (1999) and partially also in the end (2006) of the period in question is low modal age at childbearing practically without any difference among the ethnoses. The "oldest" fertility regarding the age of highest intensity of this process is attributed to Kazakh females, the "youngest" surprisingly to German females (Fig.28 and 29). Comparing the graphs one can state that in 1999 Turkic group had higher fertility rate in the ages of 20-24 which extended till the age of 30 years, while the European ethnoses age patterns of fertility displayed higher intensity of the process only in relatively early childbearing ages between 18 and 25 years. The period 1999-2006 was the period of fertility age patterns transformation into higher ages and concerned all ethnic groups. The most visible changes occurred in the case of Ukrainians whose distribution modus shifted four years, from 20 to 24 within the period of only seven years. On the other side German fertility peak still signals predominance of very early childbearing, since it moved just by one year from 19 years in 1999 to 20 years in 2006. Visual

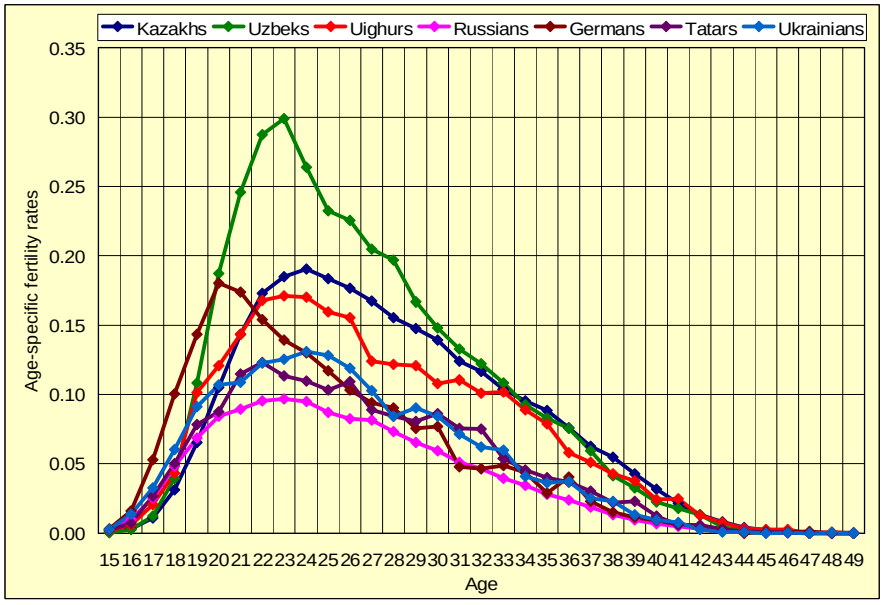
disorder among distribution curves in Fig. 30 in comparison with their relative orderliness in Fig. 29 can be interpreted in the sense that the year 2006 was a transition year, a milestone on the way from old to new quality. Kazakh, Ukrainians and Russians seemed to be already dynamically moving ahead, while Uighurs, Uzbeks, Tatars, and most likely Germans were still determining their probable future direction. Another important element of these changes is growing fertility in higher age groups and significant decline in lowest ages among all ethnoses except for Germans.

Fig. 28 – Fertility rates according age and by ethnic groups, 1999



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

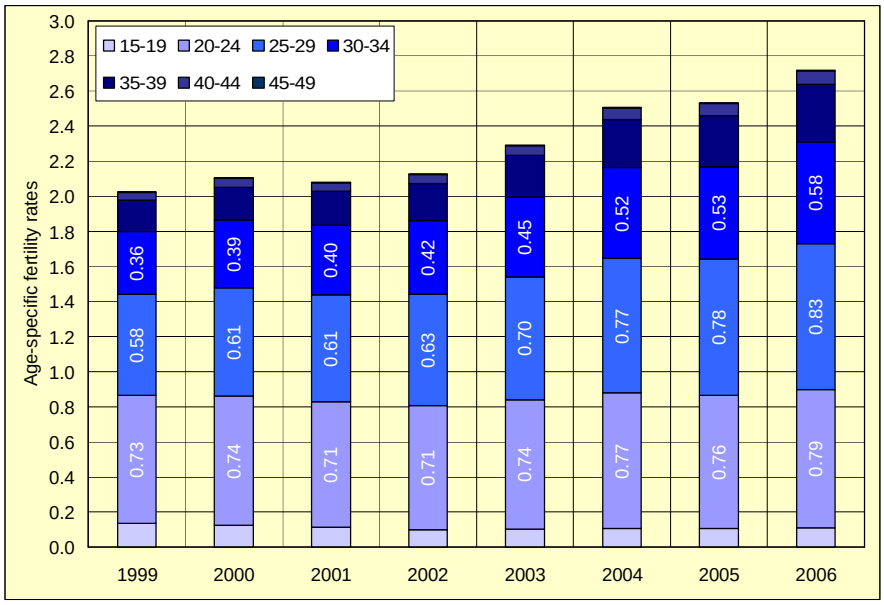
Fig. 29 – Fertility rates according age and by ethnic groups, 2006



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

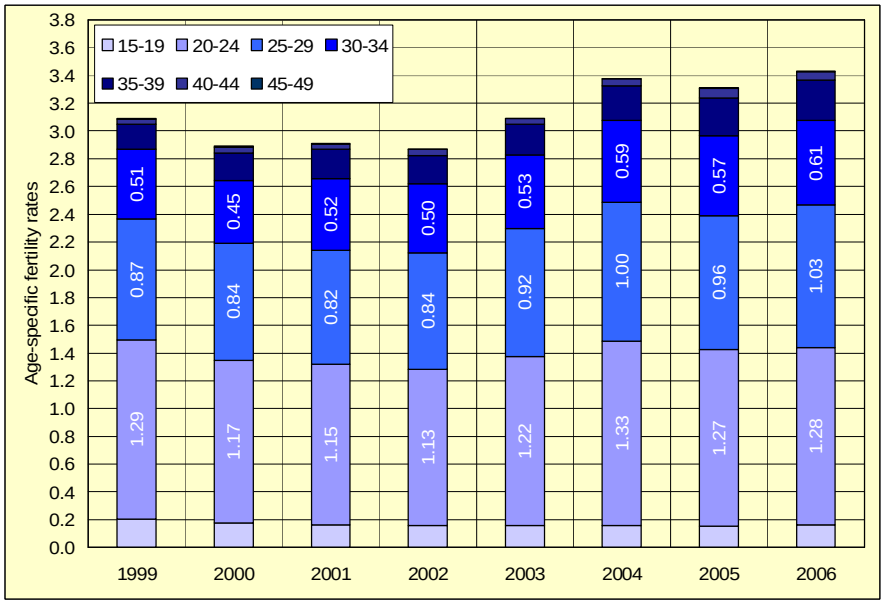
Contributions of particular age groups to the overall fertility and changes in these contributions over time correspond to a great extent with the changing structure of natality by parity discussed above. The ethnoses compensating in particular the postponement of the lower or even the lowest parity maternity have presented primarily higher contributions of lower age groups to the observed changes of the total fertility and *vice versa* (Fig.30 - 36).

Fig. 30 –Total fertility and its distribution by age, 1999-2006, Kazakhs



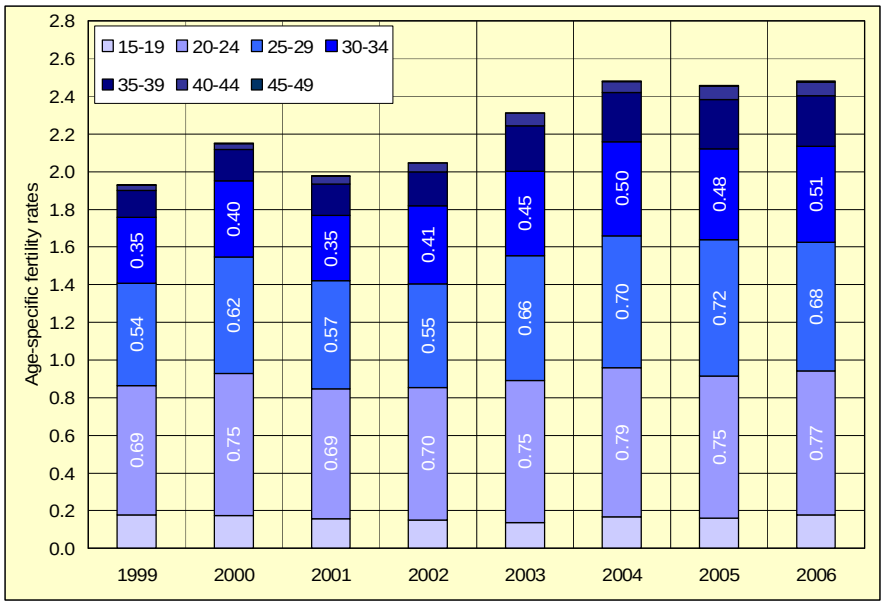
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 31 –Total fertility and its distribution by age, 1999-2006, Uzbeks



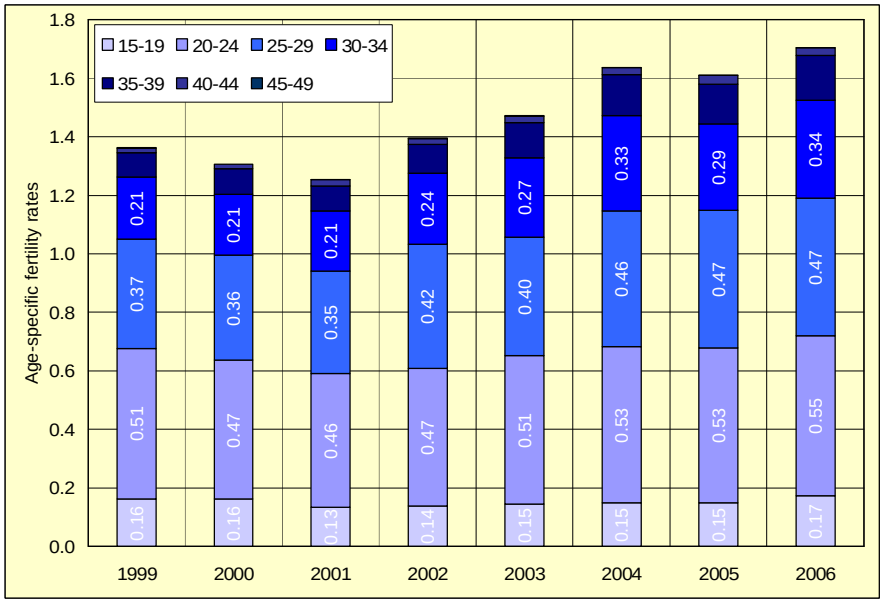
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 32 –Total fertility and its distribution by age, 1999-2006, Uighurs



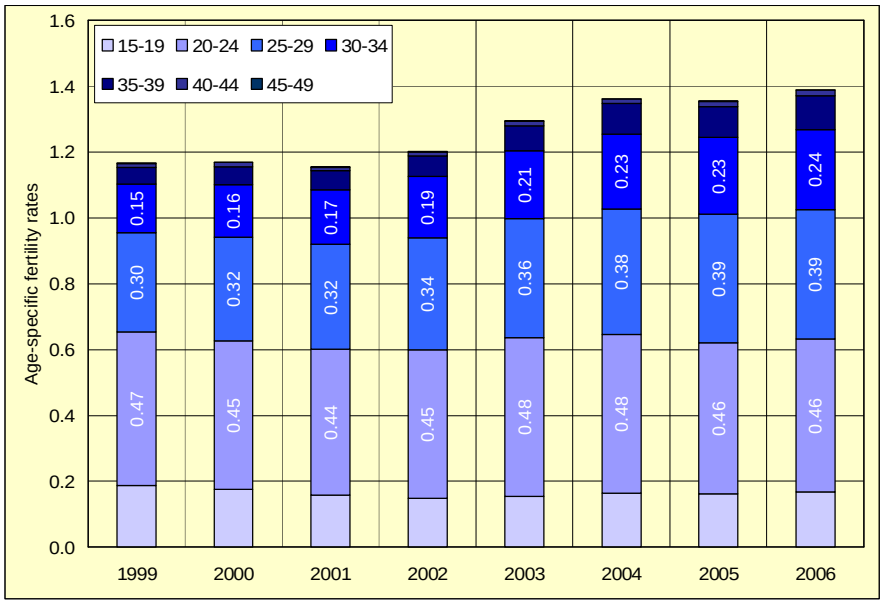
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 33 – Total fertility and its distribution by age, 1999-2006, Tatars



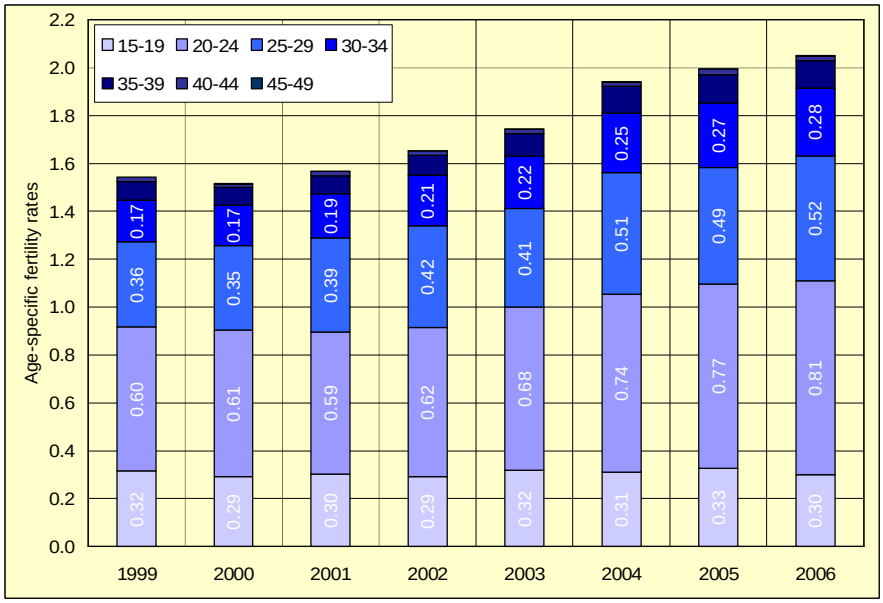
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 34 – Total fertility and its distribution by age, 1999-2006, Russians



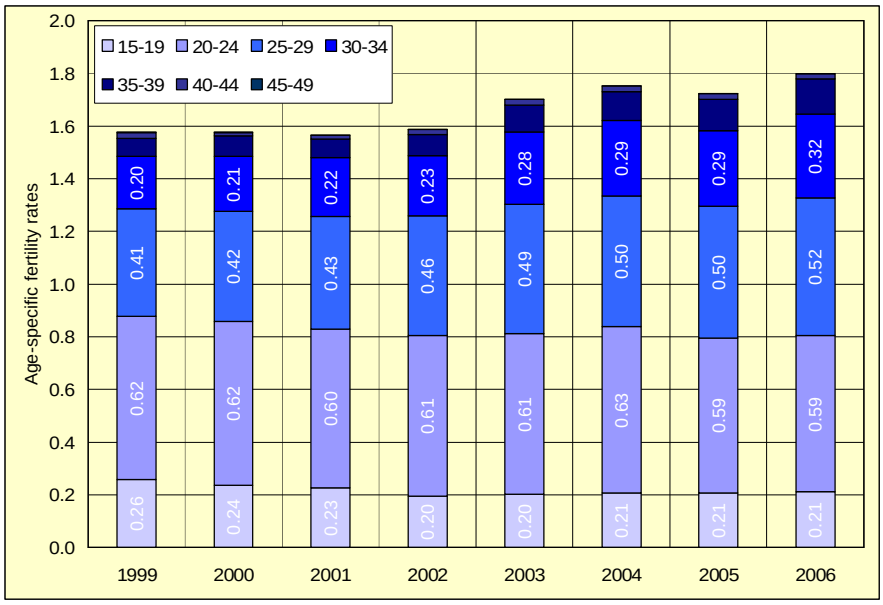
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 35 – Total fertility and its distribution by age, 1999-2006, Germans



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 36 – Total fertility and its distribution by age, 1999-2006, Ukrainians



Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

The shift of fertility to higher ages could be observed among all ethnic groups. If in 1999 the highest fertile age group was 20-24 among all ethnic groups, in 2006 only Kazakhs highest fertile age group shifted to 25-29 while other ethnicities remained in 20-24 age groups in 2006, however relative contribution of their higher age groups rose more significantly. Insignificant changes occurred in youngest age groups among Turkic ethnicities, however, substantial increase observable among higher age groups whose contribution to the final level of fertility rose substantially, while European groups' higher age-groups contribution also increased, however remained still at a lower level. Therefore, the postponement of births which occurred among all ethnic groups is more noticeable among Kazakh women. Thus, it seems that socio-economic difficulties of the1990s and subsequent developments and improvements during the 2000s, including emancipation and modernization affected significantly all ethnic groups, however most of all women of Kazakh ethnicity.

9.2.3 Fertility by birth order

Better understanding of the observed fertility changes can be supported by decomposition of the overall fertility into fertility by birth order. Following earlier introduced structure of birth order, from the first to the fifth plus, the values of total fertility by birth order and their developments are described and analysed in the following text.

Total fertility regardless the parity increased in all ethnic groups without exception. There can be distinguished three groups categorized by the size of increase using empirical data. The first

group is characterized by the most dynamic growth by about 30 % during the seven years of the observed period (Tab.20). To this first group belong Kazakhs (34 %), Germans (32 %) and Uighurs (28 %). The second group is represented by Tatars (23 %) and Russians (18 %). In the third group one can find associated ethnic sub-populations with the lowest relative growth of the overall fertility, Ukrainians (12 %) and Uzbeks (11 %). This picture is quite different from the picture drawn on the basis of natality changes. The presented finding reflects the above mentioned high diversity in developments of the number and structure of females in reproductive age among different ethnoses.

Tab. 20 – Fertility rate by birth order and by ethnic groups, 1999-2006

	1999	2000	2001	2002	2003	2004	2005	2006
Kazakhs								
All births	2.03	2.11	2.09	2.13	2.3	2.52	2.54	2.72
1st order	0.78	0.81	0.81	0.81	0.88	0.93	0.95	0.99
2nd order	0.59	0.62	0.59	0.62	0.66	0.72	0.73	0.77
3rd order	0.35	0.37	0.36	0.38	0.42	0.48	0.49	0.53
4th order	0.18	0.19	0.21	0.21	0.21	0.24	0.24	0.28
5th and higher	0.12	0.12	0.11	0.11	0.12	0.14	0.13	0.15
Proportion (per cent)								
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	38.5	38.5	39.0	37.9	38.3	37.1	37.3	36.5
2nd order	29.3	29.2	28.4	29.0	28.9	28.6	28.7	28.3
3rd order	17.2	17.5	17.3	18.0	18.2	19.0	19.1	19.3
4th order	8.7	9.1	9.8	9.7	9.2	9.4	9.4	10.3
5th and higher	6.0	5.5	5.3	5.3	5.3	5.6	5.2	5.5
Development index (1999=100)								
All births	100.0	104.0	102.8	105.0	113.3	124.0	125.1	134.3
1st order	100.0	104.1	104.2	103.4	112.8	119.5	121.3	127.2
2nd order	100.0	103.6	99.6	104.1	111.8	121.1	122.6	129.8
3rd order	100.0	105.6	103.4	109.4	119.6	136.7	138.8	150.5
4th order	100.0	108.9	115.5	116.3	119.6	134.1	135.0	158.1
5th and higher	100.0	96.1	91.0	93.4	99.2	114.9	109.3	124.0
Uzbeks								
All births	3.10	2.90	2.92	2.88	3.10	3.39	3.32	3.43
1st order	0.93	0.85	0.88	0.86	0.98	1.04	1.04	1.02
2nd order	0.86	0.79	0.77	0.74	0.79	0.87	0.84	0.91
3rd order	0.71	0.68	0.68	0.68	0.68	0.80	0.74	0.78
4th order	0.41	0.40	0.43	0.44	0.47	0.47	0.49	0.53
5th and higher	0.19	0.17	0.15	0.17	0.18	0.21	0.21	0.20

Tab. 20 – Fertility rate by birth order and by ethnic groups, 1999-2006… continue

Proportion (per cent)								
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	30.1	29.5	30.3	29.8	31.7	30.7	31.4	29.6
2nd order	27.8	27.3	26.4	25.7	25.5	25.7	25.2	26.4
3rd order	23.0	23.5	23.4	23.5	22.0	23.6	22.3	22.8
4th order	13.1	13.9	14.8	15.2	15.1	13.8	14.7	15.3
5th and higher	6.1	5.8	5.2	5.8	5.7	6.1	6.3	5.8
Development index (1999=100)								
All births	100.0	93.5	94.0	92.9	100.0	109.2	107.0	110.7
1st order	100.0	91.7	94.7	92.2	105.5	111.4	111.8	109.1
2nd order	100.0	92.0	89.3	85.8	91.9	100.8	96.9	105.0
3rd order	100.0	95.2	95.4	94.8	95.4	112.1	103.9	109.4
4th order	100.0	99.7	106.5	108.2	115.4	115.6	120.8	130.0
5th and higher	100.0	89.5	80.2	88.8	93.9	110.1	111.3	106.9
Uighurs								
All births	1.94	2.16	1.99	2.06	2.32	2.49	2.47	2.48
1st order	0.85	0.94	0.89	0.89	0.96	0.99	0.96	0.98
2nd order	0.63	0.69	0.61	0.65	0.73	0.80	0.78	0.77
3rd order	0.32	0.38	0.34	0.35	0.45	0.50	0.51	0.50
4th order	0.10	0.12	0.11	0.12	0.15	0.16	0.18	0.19
5th and higher	0.04	0.03	0.04	0.04	0.03	0.05	0.04	0.05
Proportion (per cent)								
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	43.8	43.4	44.9	43.2	41.2	39.5	39.0	39.4
2nd order	32.7	32.1	30.7	31.7	31.3	32.3	31.7	31.0
3rd order	16.2	17.6	17.1	17.1	19.5	20.0	20.5	19.9
4th order	5.1	5.4	5.3	5.9	6.6	6.3	7.1	7.8
5th and higher	2.0	1.4	2.0	2.2	1.5	1.8	1.7	1.9
Development index (1999=100)								
All births	100.0	111.6	102.6	106.2	119.8	128.5	127.2	128.1
1st order	100.0	110.6	105.2	104.7	112.7	116.0	113.2	115.3
2nd order	100.0	109.6	96.4	103.0	114.7	127.0	123.5	121.5
3rd order	100.0	121.2	108.0	111.7	143.6	158.4	160.5	157.2
4th order	100.0	118.1	106.2	121.7	154.4	159.6	177.4	196.3
5th and higher	100.0	78.5	98.9	112.2	86.5	114.3	104.1	118.1
Tatars								
All births	1.38	1.32	1.26	1.41	1.48	1.64	1.61	1.70
1st order	0.75	0.73	0.68	0.75	0.80	0.85	0.86	0.89
2nd order	0.44	0.42	0.41	0.47	0.47	0.54	0.52	0.57
3rd order	0.12	0.11	0.10	0.13	0.15	0.18	0.16	0.17
4th order	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.06
5th and higher	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02

Tab. 20 – Fertility rate by birth order and by ethnic groups, 1999-2006… continue

Proportion (per cent)								
All births	100	100	100	100	100	100	100	100
1st order	54.6	55.2	53.9	53.4	54.2	51.7	53.6	52.2
2nd order	31.7	31.9	32.7	33.2	32	32.9	32.4	33.6
3rd order	8.8	8.3	8.2	9.3	9.9	11.1	9.8	9.7
4th order	3.1	3	3.4	2.9	2.1	2.7	2.6	3.2
5th and higher	1.6	1.5	1.5	1	1.6	1.3	1.4	1.1
Development index (1999=100)								
All births	100.0	95.6	91.9	102.2	107.8	119.4	117.0	123.3
1st order	100.0	96.7	90.8	99.9	107.0	113.1	114.8	117.9
2nd order	100.0	96.4	94.8	106.9	108.8	124.0	119.7	130.8
3rd order	100.0	90.4	86.0	108.8	122.0	151.5	130.4	136.9
4th order	100.0	90.4	99.7	96.4	71.9	102.4	97.8	127.2
5th and higher	100.0	91.2	89.1	65.5	106.8	98.2	105.1	87.7
Russians								
All births	1.17	1.18	1.16	1.21	1.30	1.36	1.35	1.38
1st order	0.69	0.68	0.67	0.68	0.73	0.75	0.74	0.75
2nd order	0.35	0.36	0.36	0.39	0.41	0.45	0.44	0.46
3rd order	0.09	0.09	0.09	0.09	0.10	0.11	0.11	0.12
4th order	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
5th and higher	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Proportion (per cent)								
All births	100	100	100	100	100	100	100	100
1st order	58.5	57.8	57.7	56.3	56.3	55.5	55.2	54.8
2nd order	29.8	30.5	30.9	32.4	31.9	32.7	33	33.3
3rd order	7.3	7.5	7.6	7.6	8	8.2	8.3	8.4
4th order	2.5	2.3	2.2	2.1	2.2	2	2.3	2.1
5th and higher	1.8	1.7	1.4	1.4	1.4	1.3	1.2	1.2
Development index (1999=100)								
All births	100.0	100.3	99.0	102.8	110.6	116.0	115.0	117.5
1st order	100.0	99.2	97.7	98.9	106.4	110.0	108.5	110.1
2nd order	100.0	103.0	102.9	112.1	118.6	127.5	127.4	131.6
3rd order	100.0	103.3	102.8	106.8	121.3	130.5	129.8	135.3
4th order	100.0	92.1	89.8	88.8	98.1	93.1	104.8	101.9
5th and higher	100.0	94.3	79.4	80.5	89.9	86.3	78.0	79.4
Germans								
All births	1.53	1.50	1.55	1.64	1.75	1.93	1.98	2.02
1st order	0.80	0.79	0.85	0.87	0.93	1.02	1.06	1.07
2nd order	0.46	0.46	0.46	0.51	0.54	0.61	0.63	0.66
3rd order	0.15	0.15	0.15	0.17	0.17	0.20	0.19	0.20
4th order	0.06	0.05	0.05	0.05	0.06	0.05	0.05	0.05
5th and higher	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04

Tab. 20 – Fertility rate by birth order and by ethnic groups, 1999-2006… continue

Proportion (per cent)								
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	52.3	52.7	54.7	52.6	53.2	52.8	53.4	53.0
2nd order	30.0	30.5	29.9	30.9	31.0	31.8	31.9	32.8
3rd order	10.0	10.0	9.4	10.5	9.5	10.1	9.5	9.8
4th order	4.1	3.3	3.0	3.0	3.5	2.4	2.6	2.3
5th and higher	3.5	3.4	3.0	2.9	2.7	2.7	2.3	2.0
Development index (1999=100)								
All births	100.0	98.0	101.0	107.4	114.0	126.0	129.3	131.9
1st order	100.0	98.7	105.6	108.1	115.9	127.3	132.1	133.7
2nd order	100.0	99.9	100.9	110.9	117.9	133.7	137.6	144.5
3rd order	100.0	98.4	94.8	112.5	108.2	127.6	123.7	129.8
4th order	100.0	79.5	73.4	80.2	96.7	74.2	83.6	74.5
5th and higher	100.0	95.1	86.4	89.4	89.3	99.0	85.1	74.5
Ukrainians								
All births	1.60	1.60	1.58	1.60	1.71	1.76	1.73	1.80
1st order	0.86	0.87	0.84	0.85	0.89	0.91	0.88	0.94
2nd order	0.52	0.51	0.54	0.53	0.57	0.60	0.60	0.60
3rd order	0.14	0.14	0.14	0.15	0.17	0.17	0.17	0.17
4th order	0.05	0.04	0.04	0.04	0.05	0.05	0.04	0.05
5th and higher	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Proportion (per cent)								
All births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1st order	54.0	54.3	53.0	53.1	51.8	51.8	51.1	52.4
2nd order	32.3	31.9	33.8	32.9	33.6	34.2	34.8	33.4
3rd order	8.5	8.9	8.7	9.3	9.9	9.6	9.7	9.6
4th order	2.9	2.8	2.6	2.7	2.9	2.6	2.6	2.8
5th and higher	2.3	1.9	1.7	1.9	1.8	1.7	1.7	1.8
Development index (1999=100)								
All births	100.0	99.8	99.0	100.0	106.9	110.3	108.0	112.3
1st order	100.0	100.5	97.3	98.4	102.6	105.8	102.3	109.1
2nd order	100.0	98.6	103.7	102.0	111.3	116.9	116.4	116.1
3rd order	100.0	105.5	102.2	109.7	124.7	124.7	123.8	127.5
4th order	100.0	96.3	89.7	92.6	109.1	98.4	96.3	108.2
5th and higher	100.0	85.8	74.1	85.5	82.7	82.5	81.5	90.3

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan
Note: Unknown births are excluded

Regarding the developments of total fertility by birth parity measured through the reduced rates (rates of the second kind), the increase of fertility by all order was recorded only in the case of the Turkic ethnoses displaying higher fertility of all the birth orders, i.e. Kazakhs, Uzbeks and Uighurs. Tatars similarly to Russians and Ukrainians experienced decrease of fertility in the highest birth

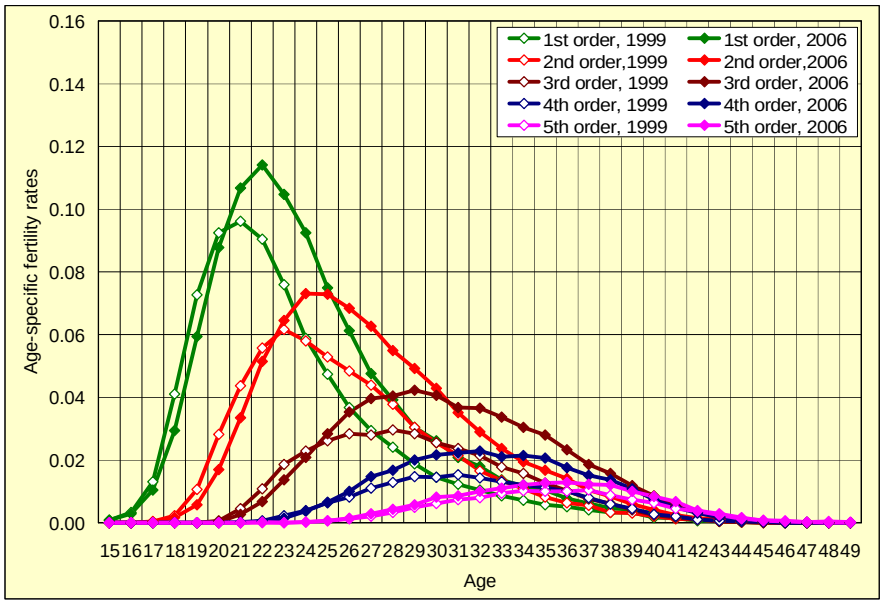
order group (the fifth plus one) and Germans do that although in the last two birth order groups. Many differences can be found also in growth intensities related to the TFR by parity within particular ethnoses and reflected in the changing relative distribution of the overall TFR according to birth order.

In general, the ethnic groups of European origin are distinguished by higher proportions of first and second birth orders which comprised between 85 % and 90 % of entire fertility in 2006, what is slightly less than seven year earlier. Turkic women, namely those of Uzbek, Kazakhs and Uighur origin traditionally distribute their overall fertility across more birth orders as it was already mentioned. The proportion of the first and second birth parity fertility varied between 56 % among Uzbeks and 70 % among Uighur in 2006. This proportion was significantly lower than in 1999 when these indicators varied between 58 % and 76 % respectively. The observed situation and its development were most likely related to the different adopted models of family and its demographic reproduction.

Developments of relative distribution of the TFR among the addressed birth orders had also its more general, common features. For instance, the three core Turkic ethnoses underwent common structural changes of fertility represented by a shift of fertility towards higher parities when namely the proportion of the third and fourth order newly born children showed a significant growth. A the same time, Tatars and ethnoses of European origin strengthened the second and third birth parities, and Germans even the first and second parities weight in their particular relative structures of fertility by birth order.

Looking for the answer on the basic features of reproduction process timing we have discovered that in the case of all ethnoses and practically all birth orders the distribution of fertility by age more or less moved to higher ages and was getting demographically older (Fig.37 and Fig.43).

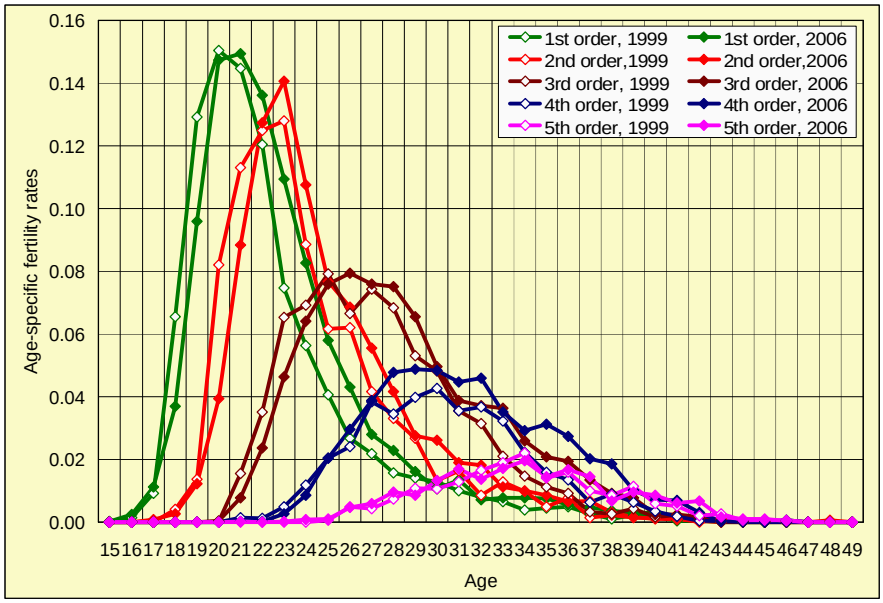
Fig. 37 – Changes in age and birth order specific fertility rates, 1999 and 2008, Kazakhs



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

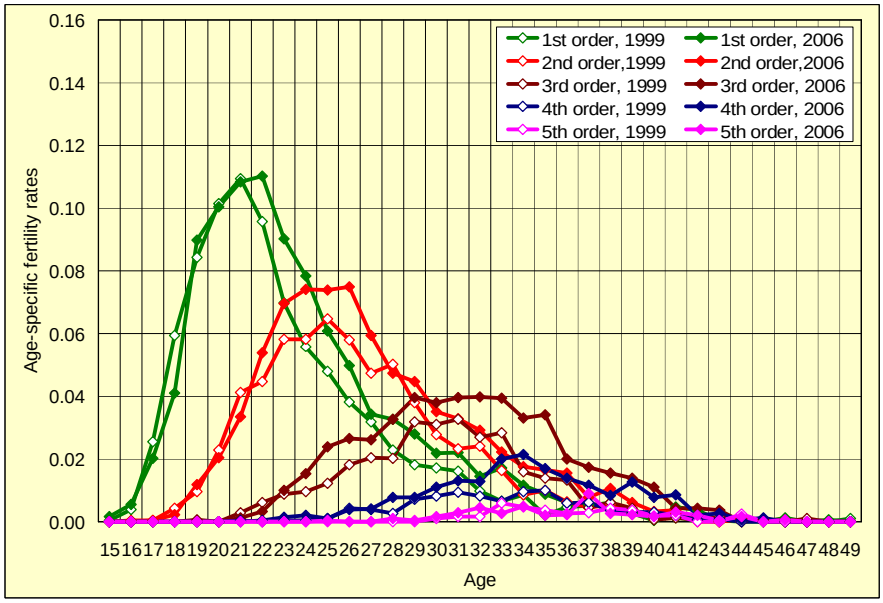
In some cases (Kazakhs, Uzbeks and Ukrainians) it was a real shift when fertility in lower ages decreased and in higher ones increased.

Fig. 38 – Changes in age and birth order specific fertility rates, 1999 and 2008, Uzbeks



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 39 – Changes in age and birth order specific fertility rates, 1999 and 2008, Uighurs



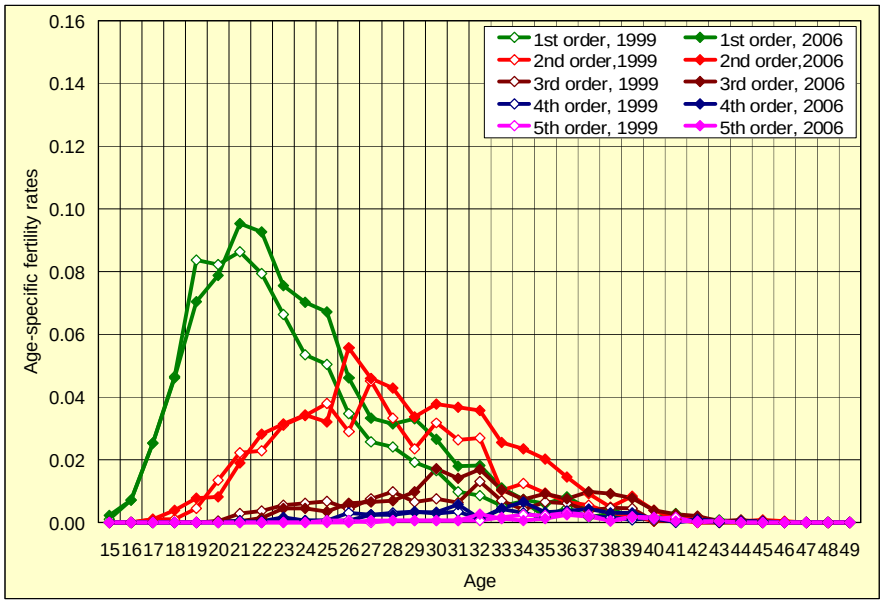
Source: own calculations based on data from the Agency of Statistics of Kazakhstan

In other cases (Russians, Tatars and namely Germans) one can observe stagnation or even increase of fertility intensities in almost all ages but in the higher ages their growth is more pronounced than in lower ones. The conclusions made for numerous sub-populations with higher level of total fertility and for lower birth orders of which more children is born are obviously more sound than

those made for small sub-populations by the number of their members since observed small numbers imply instability of structural as well as developmental patterns and the corresponding regularities remain often hidden behind sudden fluctuation in numerical series.

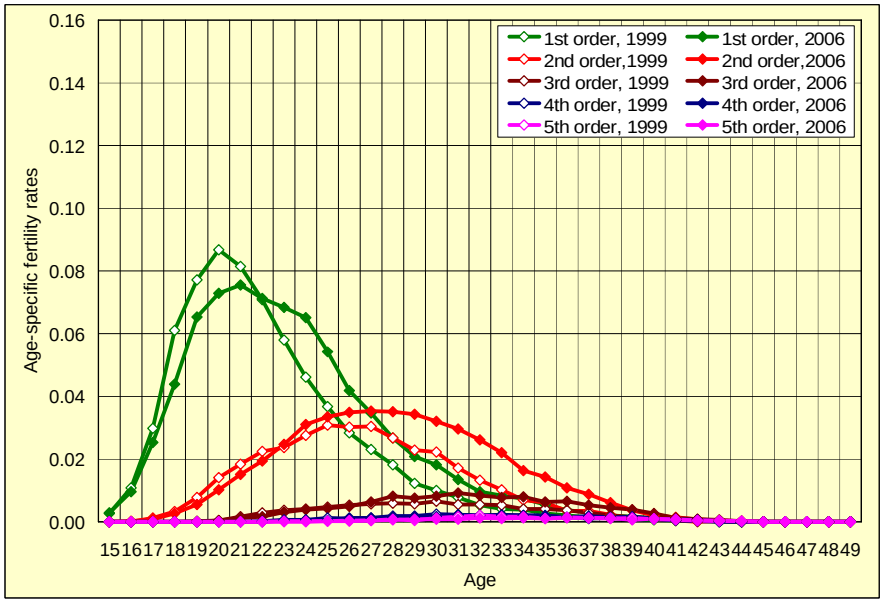
In spite of common features of the observed changes there are also principal specificities distinguishing particular ethnoses from others. For example, if in 1999 the first order children were most often born to Kazakh and Uighur women at the modal age of 21, and to Uzbek and Tatar women at the modal age of 20. Within seven years, their modal age interval shifted up by one year.

Fig. 40 – Changes in age and birth order specific fertility rates, 1999 and 2008, Tatars



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

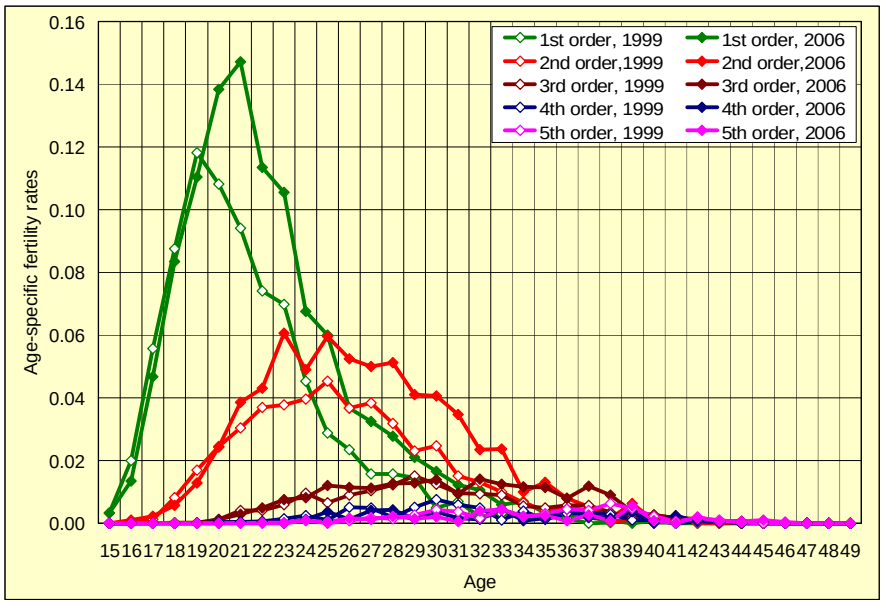
Fig. 41 – Changes in age and birth order specific fertility rates, 1999 and 2008, Russians



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

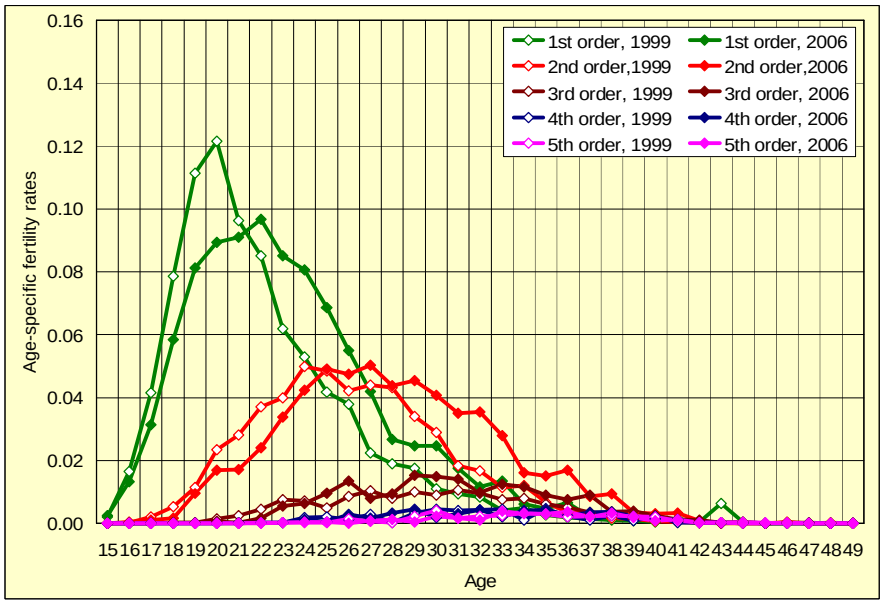
Russian and German women in 1999 gave their first births most frequently at age of 19 years but in 2006 this was happening two years later, at age of 21 years. Ukrainian females´ modal age interval during first birth also moved by two years, from 20 years in 1999 to 22 years in 2006. In this very partial respect we can speak about particular convergence of reproductive behaviour.

Fig. 42 – Changes in age and birth order specific fertility rates, 1999 and 2008, Germans



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 43 – Changes in age and birth order specific fertility rates, 1999 and 2008, Ukrainians



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Other interesting feature of reproduction is observable comparing timing of corresponding births orders fertility as presented for the selected ethnoses. Regardless the fact that females of Turkic origin start to realize their reproductive function later, their higher parity births are lagging behind less than the previous parity ones compared with females of European origin. Relatively very short inter-birth intervals can be identified especially by mutual position of the curves mirroring Uzbek females reproductive behaviour. Similar features display the corresponding graphs describing age distribution of Kazakh and Uighur fertility. However, timing of reproduction typical for Tatar females is much closer to those of European ethnoses rather than Turkic ones.

As it was already mentioned, childbearing starts relatively early among European women and is mainly concentrated in the first two births orders which are mainly occurring before the age of 30 years. Turkic women start the process of childbearing slightly later, but they continue till higher ages as the third birth orders mainly occur in the age groups 25-29 years and over 30 years; women of this group already bear mainly their fourth and higher parity children. Therefore, we can also say that women of European origin are controlling their fertility more effectively than Turkic group and their overall effectiveness is demonstrated by the low level of fertility.

These findings are confirmed by numerical characteristics of the discussed distribution curves (Tab.21, 22 and 23). The variability of mean age at childbearing according to ethnic origin was substantial during the entire period of observation and had tendency to grow. Moreover, the ethnoses were again clustered by the standard groups of origin with a specific position of Tatars. In 1999 Russian, German and Ukrainian females delivered births on average at about 25.0 years of age, i.e. at lower ages than females of other observed ethnoses presenting the corresponding values for 1-2 years higher. In 2006 the scale of differences grew with increasing average age at childbearing to 25.5 -26.5 years in the first group and between 26.5 and 28.0 years in the second one. Tatars regarding the average age at childbearing found themselves half way between European and Turkic origin ethnoses in 1999, when the average age of mother at childbearing was just below 26.0 years. Further developments brought Tatars closer to the Turkic ethnoses, when the average age at childbearing grew up above 27.0 years in 2006. However, the other indicators including the TFR value correspond more closely with European origin “type of” reproduction. For instance, the difference between mean ages of mother at first and second parity childbearing among Tatars (3.98 years) was twice as high as the value of the same indicator for Uzbeks (1.97 years) in 1999 and two and a half times higher in 2006 (4.72 against 1.97 years). These values were definitely similar to European rather than to Turkic ones. The former varied from 3.98 years (Ukrainians) to 4.37 years (Germans) in 1999 and between 4.35 years (Germans) and 4.82 year (Russians) in 2006, while the latter reached the values between 1.97 years (Uzbeks) and 3.27 (Uighurs) and between 1.95 (Uzbeks) and 3.14 (Uighurs) respectively.

Tab. 21 - Mean age of mother at childbirth by ethnic groups, selected years

	Kazakhs	Uzbeks	Uighurs	Russians	Germans	Tatars	Ukrainians
1999							
All births	27.09	26.25	26.61	25.08	24.85	25.95	25.16
1st order	23.88	22.77	23.59	22.76	21.83	23.49	22.68
2nd order	26.50	24.74	26.86	27.12	26.20	27.73	26.66
3rd order	29.64	27.84	30.88	30.54	30.21	30.76	30.31
4th order	32.17	30.89	33.38	32.45	31.52	32.42	32.47
5th and higher	35.64	34.46	36.54	34.58	34.96	35.66	34.30
2003							
All births	27.80	26.72	27.59	25.98	25.06	26.78	26.14
1st order	24.60	23.60	24.36	23.47	22.10	24.17	23.37
2nd order	27.29	24.90	27.30	28.20	26.56	28.62	27.86
3rd order	30.67	28.40	31.82	31.28	30.62	32.07	31.21
4th order	32.62	31.06	34.65	32.74	33.40	33.89	32.92
5th and higher	35.49	34.37	36.20	34.95	35.56	35.96	34.97
2006							
All births	28.34	27.15	27.86	26.51	25.48	27.06	26.55
1st order	24.81	23.46	24.35	23.88	22.75	24.26	23.79
2nd order	27.74	25.41	27.49	28.70	27.10	28.85	28.51
3rd order	31.21	28.91	31.92	31.93	31.17	32.69	31.25
4th order	33.16	31.83	34.58	33.50	32.59	33.53	33.27
5th and higher	35.67	34.54	36.61	35.20	34.98	35.73	34.93

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

These shifts are also reflected in other central values – in value changes of quartile ages and especially of the median age (Tab.22 and 23). These indicators allow not only to clearly identify fertility ageing but also to scrutinize the changes of its age dispersion.

Tab. 22 – Age distribution of fertility among Turkic group, 1999-2006, selected years

	Kazakhs			**Uzbeks**			**Uighurs**			**Tatars**		
	Lower	Median	Upper	Lower	Median	Upper	Lower	Median	Upper	Lower	Median	Upper
1999												
All births	22.61	26.07	30.83	22.16	25.19	29.61	22.12	25.74	30.42	21.68	25.03	29.48
1st order	20.69	22.78	25.87	20.18	21.76	24.06	20.38	22.42	25.65	20.29	22.54	25.63
2nd order	23.12	25.69	29.07	22.02	23.73	26.50	23.60	26.21	29.40	24.36	27.44	30.85
3rd order	26.13	29.18	32.69	24.90	27.35	30.18	28.00	30.85	33.50	27.02	30.82	34.51
4th order	28.90	31.90	35.29	27.97	30.60	33.36	30.46	33.58	36.17	28.67	31.91	36.12
5th and higher	32.48	35.64	38.71	31.62	34.30	37.12	33.82	36.10	39.10	33.78	36.04	37.99

Tab. 22 – Age distribution of fertility among Turkic group, 1999-2006, selected years… continue

2006												
All births	23.81	27.56	32.36	22.91	26.16	30.68	23.09	26.88	32.18	22.47	26.30	31.10
1st order	21.54	23.81	27.01	20.73	22.48	24.89	20.86	23.14	26.36	20.88	23.32	26.71
2nd order	24.25	26.96	30.54	22.65	24.38	27.26	24.00	26.49	30.30	25.27	28.24	32.24
3rd order	27.60	30.81	34.55	25.70	28.22	31.56	28.52	31.76	35.06	29.64	32.37	36.46
4th order	29.80	32.97	36.36	28.65	31.39	34.80	31.65	34.52	37.62	30.43	34.01	36.99
5th and higher	32.54	35.77	38.80	31.32	34.39	37.47	33.36	37.06	39.22	32.61	36.19	39.15

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

Tab. 23 - Age distribution of fertility among European group, 1999-2006, selected years

	Russians			**Germans**			**Ukrainians**		
	Lower	Median	Upper	Lower	Median	Upper	Lower	Median	Upper
1999									
All births	20.97	24.06	28.33	20.53	23.64	28.22	20.88	24.15	28.49
1st order	19.87	21.91	24.76	19.28	21.08	23.57	19.69	21.62	24.60
2nd order	23.82	26.81	30.06	22.90	25.74	28.87	23.53	26.28	29.34
3rd order	26.66	30.32	34.10	26.67	29.82	33.42	26.59	30.20	33.85
4th order	28.98	32.28	35.72	27.76	30.95	34.83	29.63	32.38	35.68
5th and higher	31.42	34.28	38.02	31.17	35.75	38.61	30.72	34.41	37.89
2006									
All births	22.13	25.71	30.29	21.32	24.37	28.80	22.27	25.80	30.32
1st order	20.57	23.15	26.28	20.07	21.95	24.60	20.55	23.07	26.13
2nd order	25.14	28.44	31.97	23.62	26.65	30.13	25.06	28.14	31.74
3rd order	28.33	31.87	35.56	27.09	30.96	35.11	27.62	31.03	34.62
4th order	29.82	33.51	37.32	28.05	32.33	36.87	29.50	33.37	37.07
5th and higher	31.72	35.34	38.61	30.96	34.35	39.27	32.49	35.23	37.99

Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Note: Unknown births are excluded

On the level of all births, regardless the birth parity, the median age at childbearing grew up most dynamically among Russian and Ukrainian women (by 1.65 years), and among Kazakhstani women whose median age at childbearing increased by 1.49 years between 1999 and 2006. The distribution of fertility by age was positively asymmetric, i.,e. the values of the observed variable, fertility intensities, were concentrated mostly in lower age, to the left from the median age, rather than in the higher age. The difference between the median and lower quartile age at childbearing was in all ethnical sub-populations substantially lower than the difference between the upper quartile and the median. In both time horizons the relative value of the former difference represented between 40% (Germans in both cases) and 44 % (Uighurs, resp. Uzbeks, Tatars, Russian and Ukrainians) of the overall inter-quartile difference. The shift of particular values signaled that the symmetric character of the observed distribution was slowly growing in general. It is a standard situation when fertility is ageing and the mean and modal ages are increasing.

Similar changes in fertility distribution by age can be clearly seen also at the level of individual birth orders, especially those concerning the first and second birth parity ASFR. In the higher birth orders some structural and mainly developmental irregularities are already visible, which could be explained either by small population size of most ethnoses, which are not enough numerous and/or the numbers of birth are too small to provide representative data.

Substantial ethnic differentiation of observed structures and their developments pose plenty of questions for further investigation. Among the most important questions is the question why we face such differences among those ethnoses when we observe them in the same place and in the same time frames. According to Agadjanian (2007), reproduction is a potentially important demographic mechanism through which individuals may adjust to dramatic changes in their environments. The conventional demographic wisdom suggests that in a "traditional" society, where childbearing and marriage are closely related, the postponement of the onset of childbearing would typically be achieved by delaying marriage.

According to Schoen et al. (1997) given lack of an economic incentive to have children, it is also likely that culture is working through the social value placed on children. Schoen et al. (1997) found compelling evidence for the hypothesis that people for whom children have a strong social value have higher fertility. Therefore, where cultural forces lead to a higher social value of children or a higher social value of being married, then it is likely that people will tend to have more children, and to get married and remain married. According to McQuillan (2004), these cultural determinants can be divided into variables that directly influence fertility through the proximate determinants, and broader values and principles.

So, Turkic group is characterized as a more traditional one than Europeans, for whom childbearing before marriage is not acceptable to relatives, neighbors or to people surrounding them. Historically, the common practice among Turkic groups is to marry according to established tradition and then after the marriage only, to bear a child. Also, most women immediately after their marriage are trying to become pregnant. This kind of phenomena could be met among women of Turkic group very often. While European women hold much more contemporary point of view concerning marriages, family formation and childbearing. The bearing of child before marriage or in unions starts to be regarded as a usual behavior. The same is concerning divorces which can be met frequently among these women. Thus childbearing starts earlier among women of European origin since it is not controlled or influenced by some other factors as much as in the Turkic group.
Different ethnicities also differ in their attitudes and expectations about the timing of marriage, family size and family formation behavior (Goldscheider, 1988). Since it is undoubtedly the case of the observed ethnoses, many of the above mentioned differences and expectation are influencing reproductive behavior of ethnic groups. However, this differentiation is growing out of similarity since the fertility distributions are transforming in similar directions, the observed values of quartile and median ages are increasing among all ethnoses. On the other hand, the overall fertility levels and timing of childbearing are rather different and some of these differences started to deepen recently. This could be explained by two major factors. Firstly, Turkic women presented

principally higher and during the entire period of observation markedly growing level of total fertility. Secondly, females of European origin start their reproduction significantly earlier, frequently entering motherhood at a very low reproductive age.

Regardless limitations created by available data and resulting in necessary work solely with period data and no possibility to use other than reduced rates when studying birth parity specific fertility and its developments, the presented analysis is completed by analysis of family enlargement based on the parity progression ratios and developments of their values. This approach, similarly to its application above, allows to complete the detailed insight into recent dynamics of fertility developments in the major ethnical sub-populations represented in Kazakhstan and to contribute to better understanding of the mechanism and observed trends in the overall fertility changes.

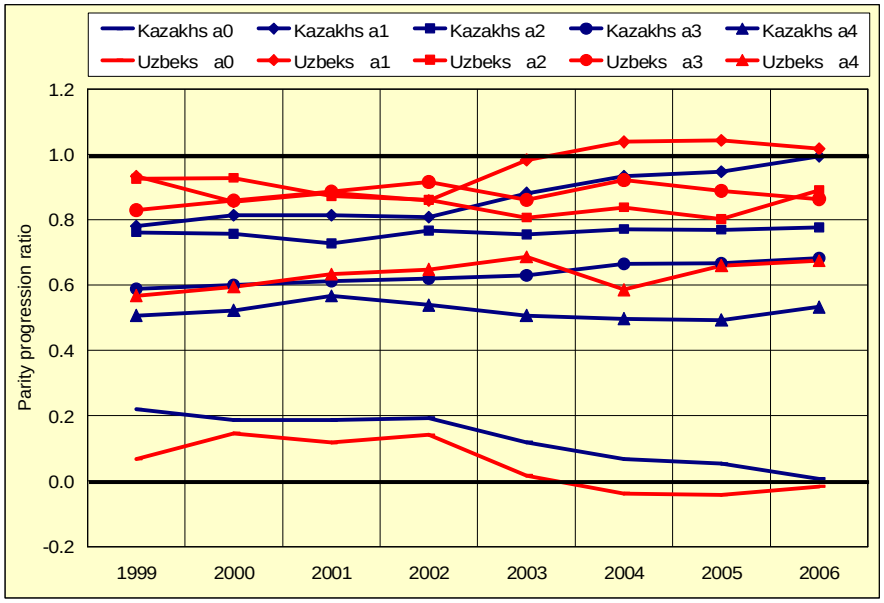
As it was already shown, ethnicity in Kazakhstani society is an attribute which strongly differentiate basic characteristics of fertility as well as their development. Therefore the observed high differentiation of parity progression rate values among ethnoses is not a surprising fact as it is not surprising that also the changes that they undergone between 1999 and 2006 were relatively significant (Fig.44 – Fig.47). The extent of changes corresponds with the changes of parity specific fertility rates and directly depends on time stability of their particular shares in the total fertility.

Significant changes in the parity progression ratio values during the period of observation (1999 – 2006) were present among practically all ethnic groups in question. The most noticeable change occurred probably in the values of Germans and Uzbeks ratio of parity progression to the first child where it increased and even exceeded one. It can be explained through concentrated parallel realization of births postponed earlier and increasing fertility among young women who did not postpone their maternity at all or for a shorter time period. So the postponed births occurring in relatively later ages are realized alongside with women whose motherhood started relatively early. As it was highlighted by Rindfuss, Morgan, and Swicegood (1988), permanent childlessness results most often from a series of decisions to postpone childbearing and not from firm decisions made early in life to remain childless. Thus, the proportion of women who became mothers for the first time could be high as in the year 2006 and the proportions of childless women (a0) could be decreasing at the same time when the probability of transition to the first child is increasing. Therefore, we can say that women of German and Uzbek ethnicities were probably the most sensitive to the positive social and economic developments in the country which affected reproductive behavior of all ethnoses.

Mentioning specifically German and Uzbek developments it does not mean that the ratio of progression to the first birth parity would not be significant in the case of other ethnoses. Only their values did not get above the logical limit of probabilities. Besides positive development of the first parity progression ratio identified across all the ethnoses, each ethnos presented significant increase of the progression ratio of at least in one other parity which recorded the highest or high enough relative growth of fertility. This parity was generally higher among Turkic ethnoses and lower among European ones plus Tatars. Due to substantial increase in fertility of the fourth birth order, the highest increase of the fourth parity progression ratio was observed in Uzbek population,

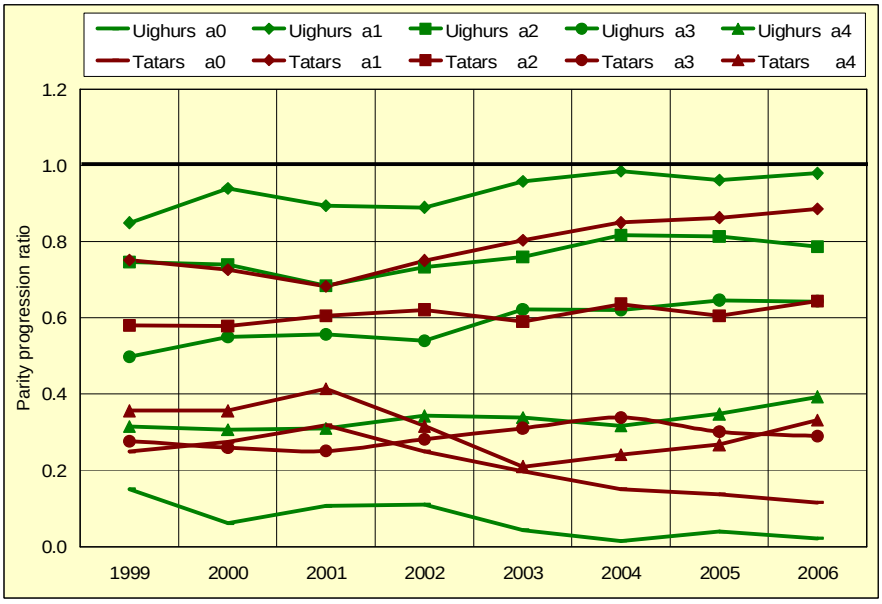
however significant was also the growth of the third parity ratio value. Kazakhs and Uighurs point of gravity corresponded with the third birth parity. The others ethnoses, Tatars, Russians, Ukrainians an Germans experienced more or less visible growth of parity progression ratio values related to the second birth order, just according to allocation of the most significant deficit of births caused by the previous postponement of maternity.

Fig. 44 – Parity progression ratio of Kazakhs and Uzbeks, 1999-2006



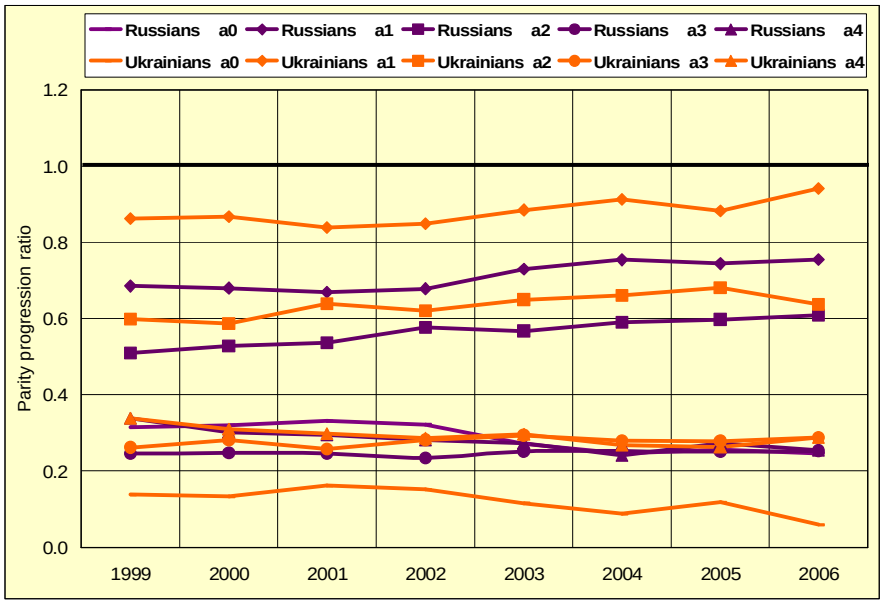
Source: Author's calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 45 – Parity progression ratio of Uighurs and Tatar, 1999-2006



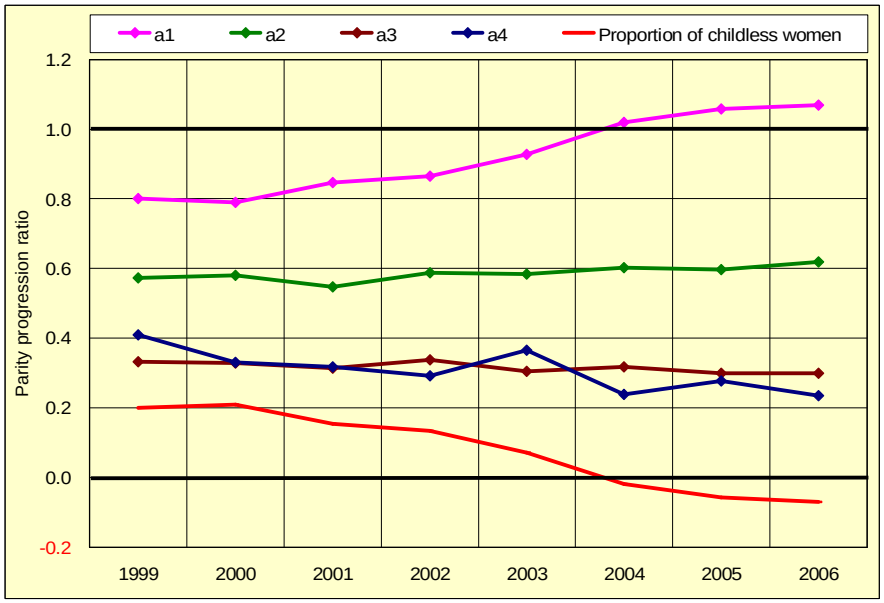
Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 46 – Parity progression ratio of Russians and Ukrainians, 1999-2006



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Fig. 47 – Parity progression ratio of Germans, 1999-2006



Source: own calculations based on data from the Agency of Statistics of Kazakhstan

Preceding analysis showed considerable high variation of fertility rates among two ethnic groups. Considerable variation was observed in all basic parameters of fertility, the number of children and the age structure of overall as well as parity specific fertility. The core Turkic group members, Uzbeks, Kazakhs and Uighurs have the highest fertility rates especially due to high proportion of high births orders while women of European ethnic origin realize mostly the two child family

model. Their reproduction, however, starts significantly earlier. Therefore, the frequently used theoretical approach which associate or even explain the higher total fertility by early start of reproduction is not applicable to the situation in Kazakhstan during the period in question. Moreover, this fact makes evident high effectiveness of birth control at least among the ethnoses of European origin and partially also Tatars. Most of the discussed ethnic peculiarities of reproduction are directly connected with different traditions and other cultural settings which differently regulate reactions of particular ethnoses to the external factors such as socio-economic development and modernizations. It is clearly seen that the tradition of higher number of children in families among Turkic ethnoses is still principally surviving. In the same way, the ethnoses of European origin have clearly demonstrated continuing reproductive attitudes corresponding to the two-child family model. This relative stability of attitudes and their realization definitely is not here forever.

Conclusion

Presented in this thesis analysis revealed that fertility behavior of Kazakhstan's population has significantly changed during the current decade when the socio-economic situation has stabilized and the well-being of the nation has improved. Observed trends demonstrate that the total fertility level has substantially increased. Many births postponed during the 1990s were realized in the current decade. This process contributed to the overall level of fertility and considerably influenced its distribution by age.

The initial age structure of fertility faced both-sided ageing when smaller contribution was represented by moderate decreasing fertility in lower ages and that more significant by its increase in higher ages. It means that the recent reproductive behavior of women is significantly different from fertility patterns of their mothers and grandmothers, both in terms of the total fertility rate and in terms of structural characteristics. The main reason of this development is a complex transformation of the reproduction environment due to total change of socio-economic conditions, rapidly proceeding modernization and progressive emancipation of some categories of population, especially women. However, it does not mean that reproductive behavior of population is totally different from the previous one and that its continuity was fully disrupted. Many features of traditional reproductive behavior continue to survive, for example, intentions of some ethnic groups to have higher numbers of children. This kind of traditionalism has its important place especially in some rural areas. Presented analysis of fertility and its dynamics showed that increase of their intensities tightly correlates with population's place of residence and ethnic composition. Differentiation of fertility dynamics according to the type of settlement (rural/urban) and ethnicity is an important factor determining the future paths of fertility in the Republic of Kazakhstan as a whole. The results of analyses carried out in this work have shown that reproductive behavior of women has differed by places of residence and by ethnicity as they are influenced by certain values, attitudes and norms that may be unrelated to socio-economic characteristics of population. These values vary among particular social groups or as in our case, among ethnoses or ethnic groups and inhabitants residing in different places.

Based on presented results we can conclude that the urban-rural differentiation is not a static phenomenon. Population of urban areas with the prevailing postponement of first births considerably differs in its reproductive behavior from population of rural areas. The typical pattern of high fertility rates in rural areas remained stable over the period 1999-2006, whereas urban areas were characterized by notably lower fertility rates, however, these differences are becoming narrower nowadays due to rapid growth of fertility among urban residents. Existing differences among women residing in different territorial settings are mainly due to their decisions to have or not to have children of a higher births parity. The proportion of the third and higher order births is definitely higher in rural areas whereas urban areas are characterized by the high proportion of children of the first two birth orders among newly born. The initial hypothesis based on the expectation that the mean age of mother at birth has increased in both rural and urban areas was

proved. Regardless the fact that it increased slightly more in rural areas than in urban ones, the mean age of first birth is still lower in rural areas. Thus, the initial hypothesis that rural women starts childbearing earlier than urban women based of lower age or rural females at marriage was proved.

It seems that population policies and especially housing programs together with economic characteristics of women have influenced more fertility in urban areas. In rural settlements, young couples are highly influenced by the psychology of older generations mostly promoting large families. In rural families it is much easier to raise a child with limited economic resources due to higher level of intra-family solidarity and lower costs of living. To raise children is more simple within wide community networks, where help from parents, relatives and neighbors is easily available. Women do not think about career or job because men are considered as breadwinners mainly while women stay at home being busy with house work including raising children. In urban areas women usually need to reconcile their employment with family responsibilities and therefore they are forced to adopt modern life attitudes and behaviors.

The fertility changes which took place in Kazakhstan during the last decade differed among women by the place of residence as well as by ethnicity. At first glance, the ethnic factor in Kazakhstan fertility developments appears to be very important since the ethnic differentials are clearly visible. The analyses show strong variation of fertility levels and patterns among major ethnic groups of Turkic and European origin. The highest fertility is calculated for Kazakhs, Uzbeks and Uighurs. It should be noted that in most cases, the demographic characteristics of this core Turkic ethnoses have differed from other ethnic groups due to peculiarities of traditions, which still dictate the style of their demographic behavior.

The analysis of fertility introducing birth parity to already discusses attributes showed that the basic origin of differences in reproductive behavior between rural and urban sub-populations as well as among ethnoses. The higher level of fertility is generally attributed to more significant share of higher birth orders since the progression ratios of the first and second parities displays similar values across all observed ethnicities and both types of settlements.

Difference in fertility levels among Kazakhstani women living in different areas and different ethnic groups are still present despite the effects of global economic and social trends that carry structural and value changes into the countryside and probably may remain in the near future.
However, some studies of changing patterns of fertility behaviour in developed societies stress the importance of values and attitudes related to fertility behaviour. Differences in fertility behaviour among individuals and social groups are seen more as a consequence of differences in their social-psychological predisposition and less as a consequence of differences in their standard of living or access to services offered by the state (Obersnel Kveder, 2001).

The observed differences in fertility behaviour among different ethnic groups and among population living in various areas with different socio-economic characteristics also call for diversified actions of population policies. So the population policies in Kazakhstan should integrate specific territorial approaches expressed, for instance, through urban and rural developmental

programs that would consider diverse living conditions and needs of people residing in different territorial settings.

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Appendix

Code of institution according GCEO

The Ministry of Public Health
of the Republic of Kazakhstan
The name of organization

Medical documentation
Form № 103/y-03
Confirmed with the order of
Ministry of Public Health of the Republic of Kazakhstan from 8th of September 2003. № 664

Medical Birth certificate №_____

Date of issue "_____" _____ 20____

1. Surname, name patronymic (name) of mother

_____

2. Temporary place of residence of mother:
Oblast/region/city/district/settlement_____St
reet_____, home_____, flat._____
3. Date of birth of mother: year_____, month_____, date_____
4. Nationality of mother: _____
5. Date and time of delivery: year_____, month_____, date_____, time ____min.___
6. Place of delivery: in hospital – 1, at home – 2, another place – 3
7. Sex of infant: boy – 1, girl – 2, not specified – 3
8. The infant born: in monocarpic – 1, first from twins – 2, second from twins – 3, third from multiple births – 4
9. The infant born in mature – 1, premature – 2, postmature – 3
10. Weight of infant at the time of delivery _____gr
11. Height of infant at the time of delivery _____cm
12. The name of medical organization which gave the certificate_____
13. Surname, name, patronymic (name) and position of the medical employee which gave the certificate

_____

Stamp of medical organization or physical person practising private medical service

The signature of medical employee, which gave the certificate