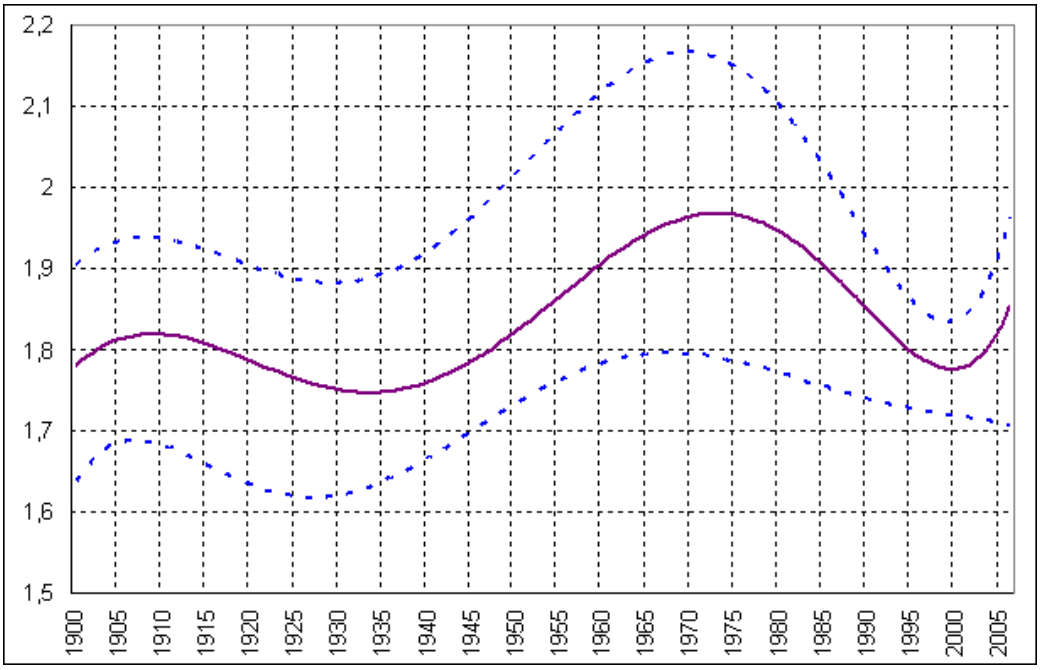
Problem 25.

Study of demographic statistics materials on a wide range of countries in the world in an accessible retrospect, i.e. for a period of not much more than a century (1890 - 2007), revealed the existence of demographic constants: the main proportion of the population that are in the working age in different regions and substantially spaced age intervals, is a fairly stable quantity. The value of the indicator that reflects the number of dependents, which come for one potentially work capable citizen, including itself, in most cases is in the range of 2,0:1,7 for all the countries surveyed in a statistically foreseeable time range (see Figure 1). This, offered by us, indicators is named «**level of demographic load of the employable**» - **LDLE**)[1].

Figure 1. Range of variations of LDLE [2]since 1900 to 2007 (average indicator, minimum and maximum)



Analysis of changes of the specific demographic load of the employed, in combination with other indicators of the structure of the population, allows to make an assumption on the existence on our planet of countries and regions, that related to various demographic types.

---

[1] Calculation includes the data on the following countries: Austria (since 1921), Belgium, Great Britain, Hungary (since 1982), Germany (since 1991), Denmark, Iceland, Spain (since 1908), Italy, Canada (1921), Netherlands, New Zealand, Norway , Russia (1958) United States (since 1932), Finland, France, Switzerland, Sweden, Japan (since 1947).

[2] The use of the load indicator of the employable people (LDLE), and not the worker (in the terminology of UN statistics - «employed») allowed us to cover, in retrospect, a much larger array of information to determine the nature that of the trends researched by us, in relation to the volume of the available data for analysis on the proportion of employed in the population of the countries of the world, published by the Statistical Commission of UN (http://unstats.un.org/).

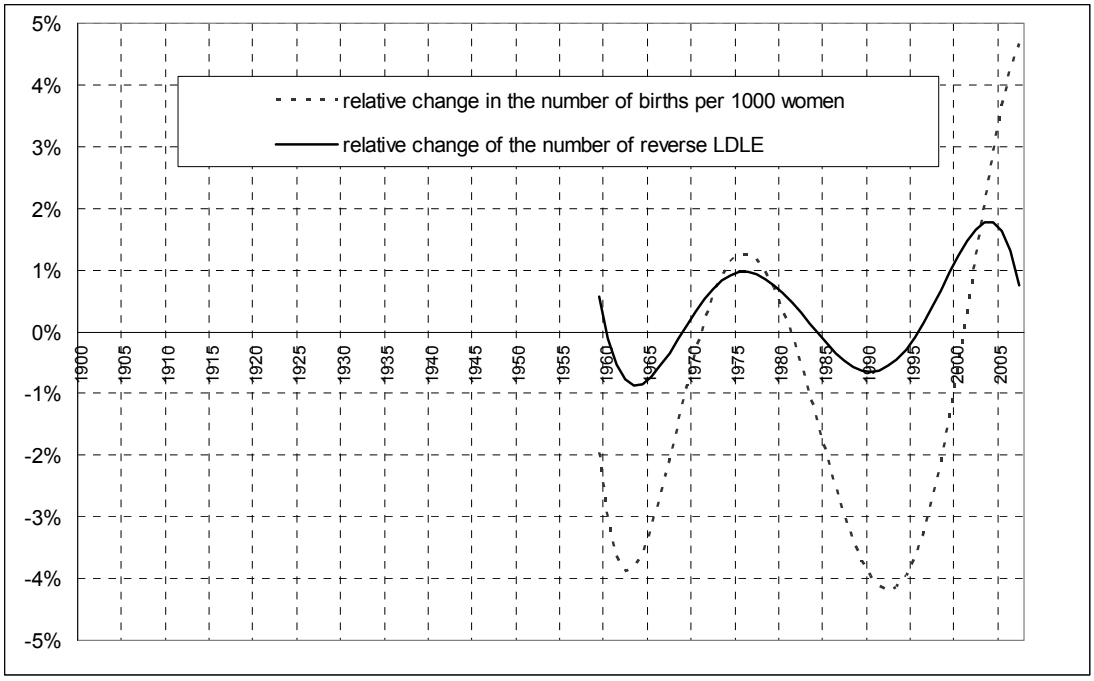
The notion of «employable person» and «employed» are by no means identical, nonetheless factual deviations of the calculated values of the load of the employed and employable people that do not overlap in the time intervals in the arrays of statistical data, is very low (less than 1%).

Demographic type of a country (region) determines the characteristics of the dynamics of changes in the structure of the population. These characteristics include: oscillation frequency and amplitude of changes in various structural demographic indicators, as well as particularities of the forms of their relation.

Research of the problem of existence of country related demographic types was conducted by us based on establishing the relationship between changes of the indicator of specific load of the employable people and the ratio of total fertility.

Figures 2 and 3 show the two most significantly different forms of relation change of the ratio of the total fertility rate (births per 1000 women of childbearing age) and the reverse rate of **LDLE**[3]. For comparison we use the data on RSFSR/Russia, Netherlands.

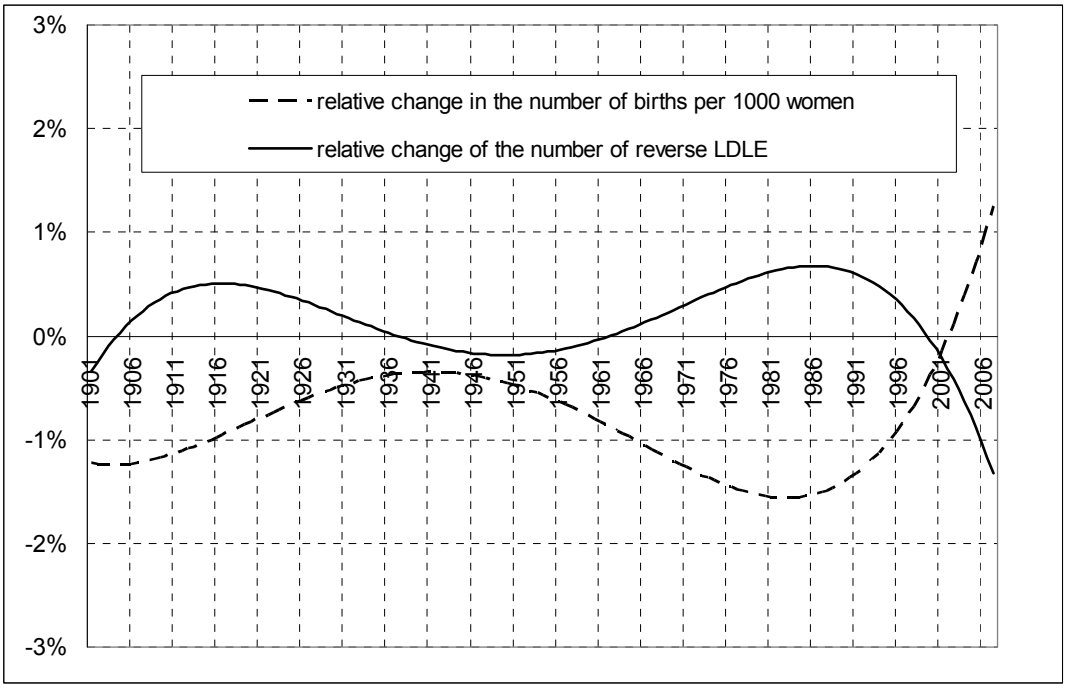
Figure 2. Changes of the relative, year by year, indicators of the ratio of total fertility (TFR) and the value of the reverse LDLE (rounded curbs[4]) on RSFSR/Russia.



[3] Use of the value, in this case, reverse to the LDLE, in our opinion, allows to more clearly evaluate the availability or absence of the relation between decrease of the specific demographic load and growth of TFR.

[4] We applied the method of least squares.

Figure 3. Changes of the relative, year by year, indicators of the total fertility (TFR) and the value of the reverse LDLE (rounded curbs) on Netherlands.



The presented forms of relation of the considered indicators and characteristics of their dynamics are very different:

- by the oscillation amplitude of considered indicators of demographic structure. In the Netherlands the absolute value of deviations of change in the value (increase or decrease) of the submitted LDLE in the presented period was about 1%, in RSFSR/Russia (in the statistically accessible range) - twice as much. Even more noticeable are the differences in the oscillations under TFR indicator - about 9% in RSFSR/Russia and less than 3% for the Netherlands.

- period of oscillations. Netherlands are characterized by the oscillation period of changes of indicators surveyed (from one peak to another) in 70-75 years, in RSFSR/Russia - about 30 years.

- form of relation. Indicators of incremental values of reverse LDLE and TFR in the case of the RSFSR/Russia changed synchronously, and in relation to the Netherlands - asynchronously.

Graphs, reflecting the changing dynamics of the reverse LDLE and TFR in all the cases presented (except for Russia), can be traced with a certain connection between the change in the demographic load of the employable people and the birth rate.

Figure 4. Changes of the relative, year by year, indicators of the ratio of total fertility (TFR) and the value of reverse LDLE (rounded curbs) in Finland.

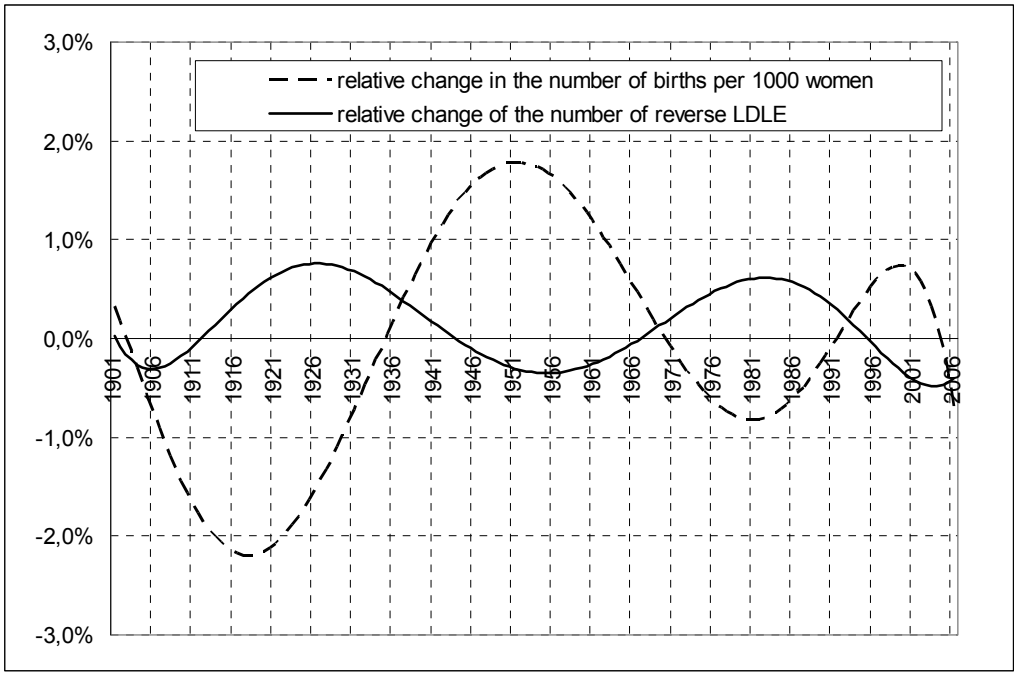


Figure 5. Changes of the relative, year by year, indicators of the ratio of total fertility (TFR) and the value of reverse LDLE (rounded curbs) in Spain.

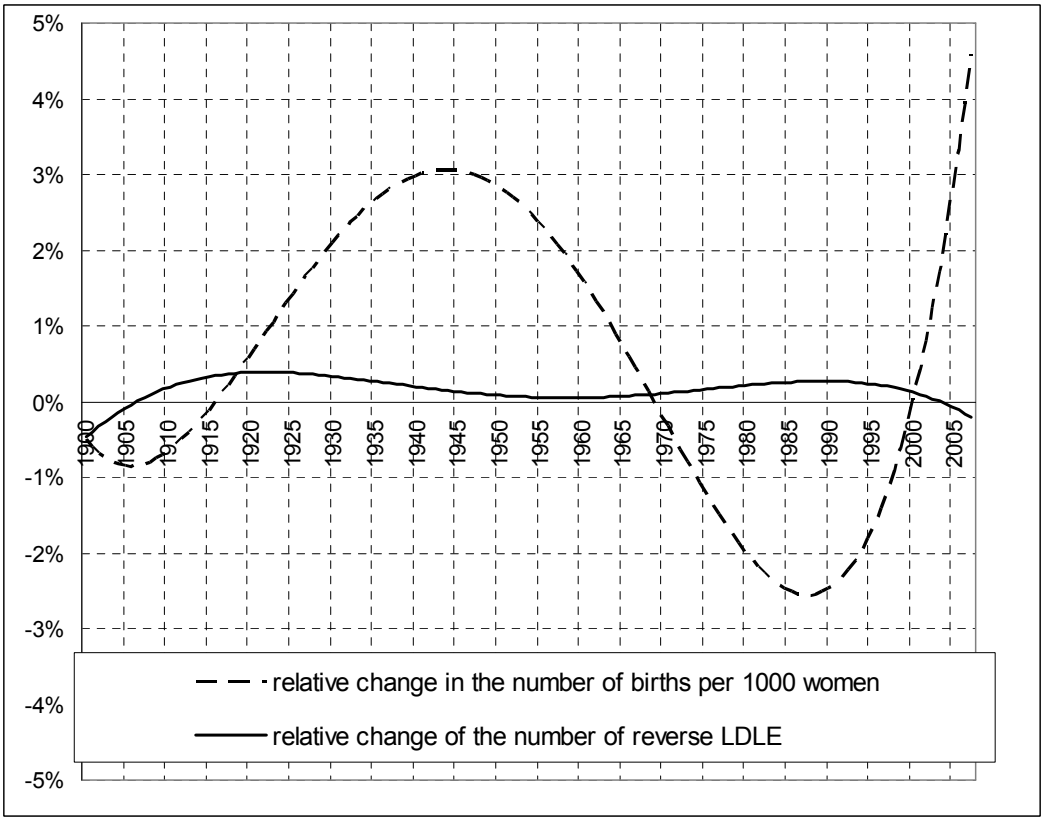


Figure 6. Changes of the relative, year by year, indicators of the ratio of total fertility (TFR) and the value of reverse LDLE (rounded curbs) in Italy.

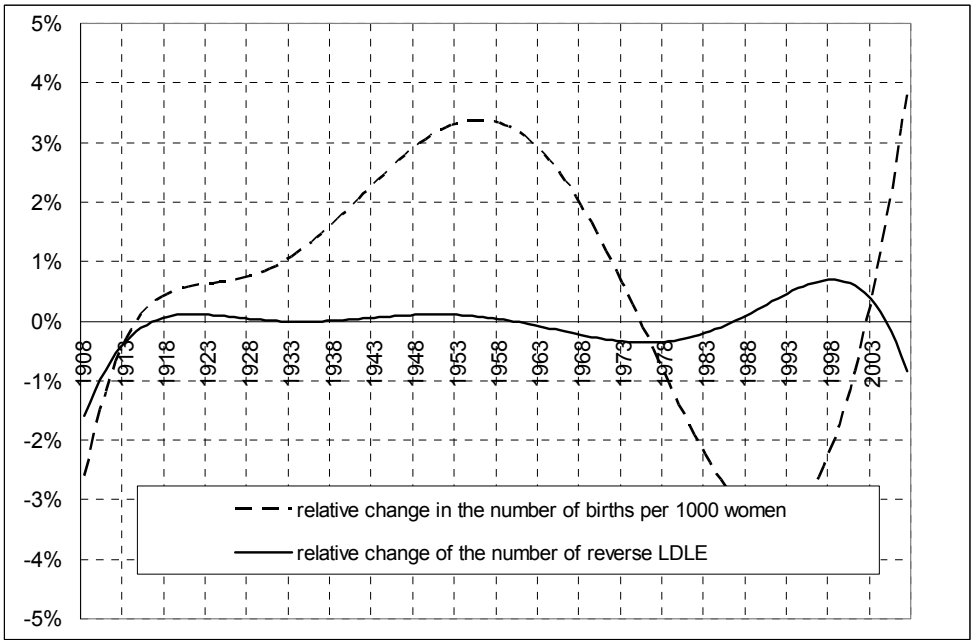
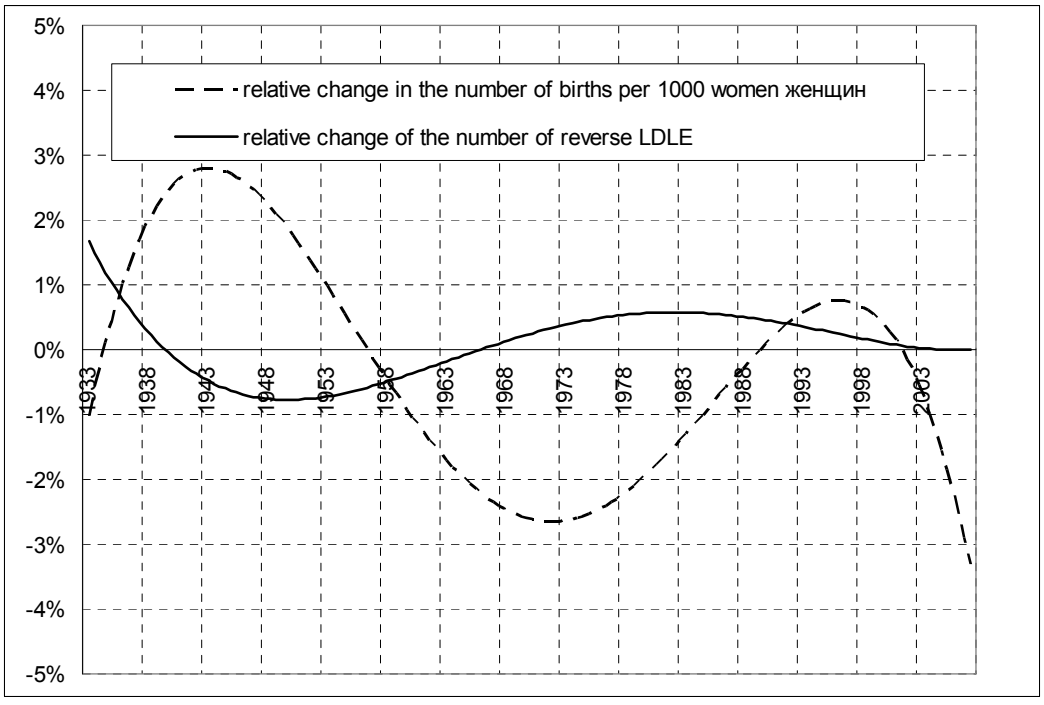


Figure 7. Changes of the relative, year by year, indicators of the ratio of total fertility (TFR) and the value of reverse LDLE (rounded curbs) in United States.

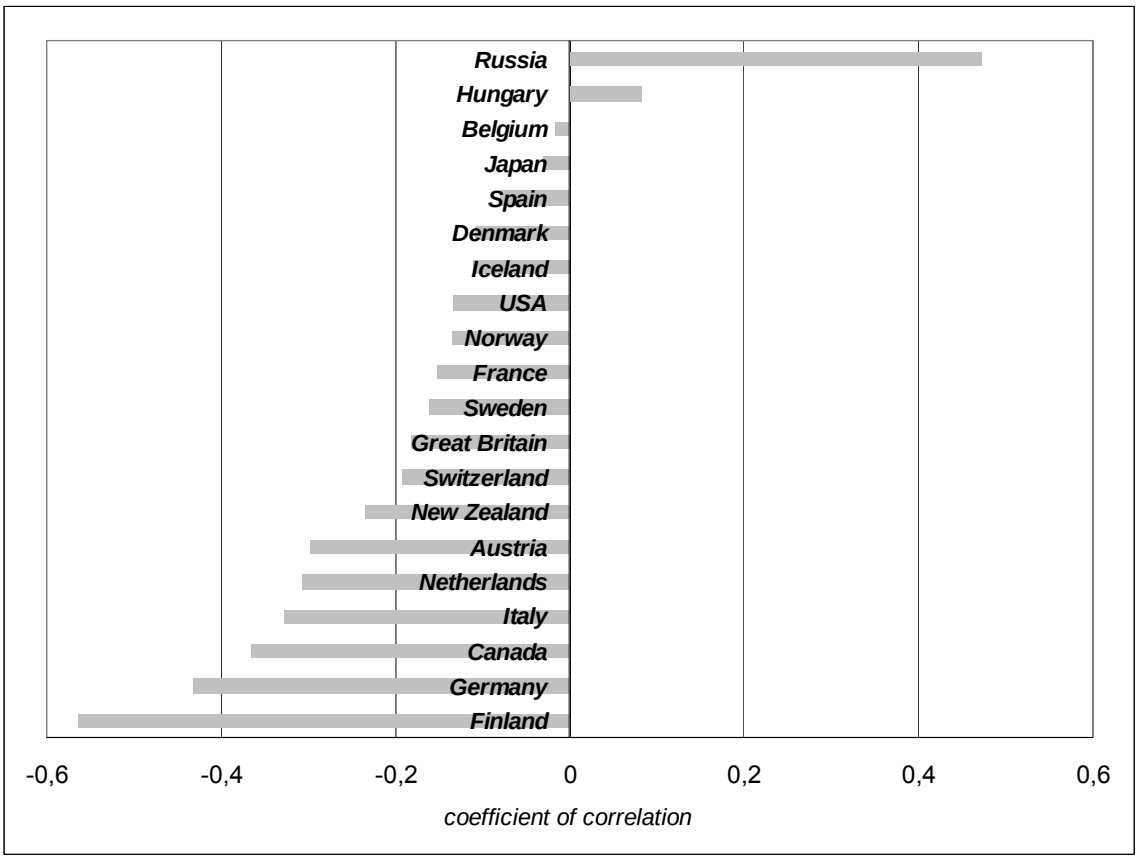


Figures 4,5,6 and 7 display graphs of changes of researched indicators for Finland, Spain, Italy and the United States.

The data shows that with a certain lag of load reduction, these countries saw a relatively higher fertility level and vice versa. Lag - time difference between two similar (maximum or minimum) peak values of LDLE and TFR - is in the range of 60-80 years.

It has been noted that the calculations carried out under the data of the demographic statistics of RSFSR/Russia (see Figure 2) give qualitatively different results from those obtained for the overwhelming number of countries in Europe and the United States. The difference is that the changes of LDLE and KRS in our country in the statistically foreseeable period, took place almost synchronously with the frequency and amplitude of oscillation that exceed the indicators of other countries in two or more times. If, when comparing changes in LDLE and KRS indicators, we draw attention to two main characteristics: a period of oscillation and delay lag of KRS in relation to **LDLE**, then it is possible to identify significant differences in the processes taking place recently in the RSFSR/Russia in comparison with Europe and the U.S.A..

Figure 8. Correlation between relative changes of the reverse value of LDLE and the indicator of the number of births per 1000 women.

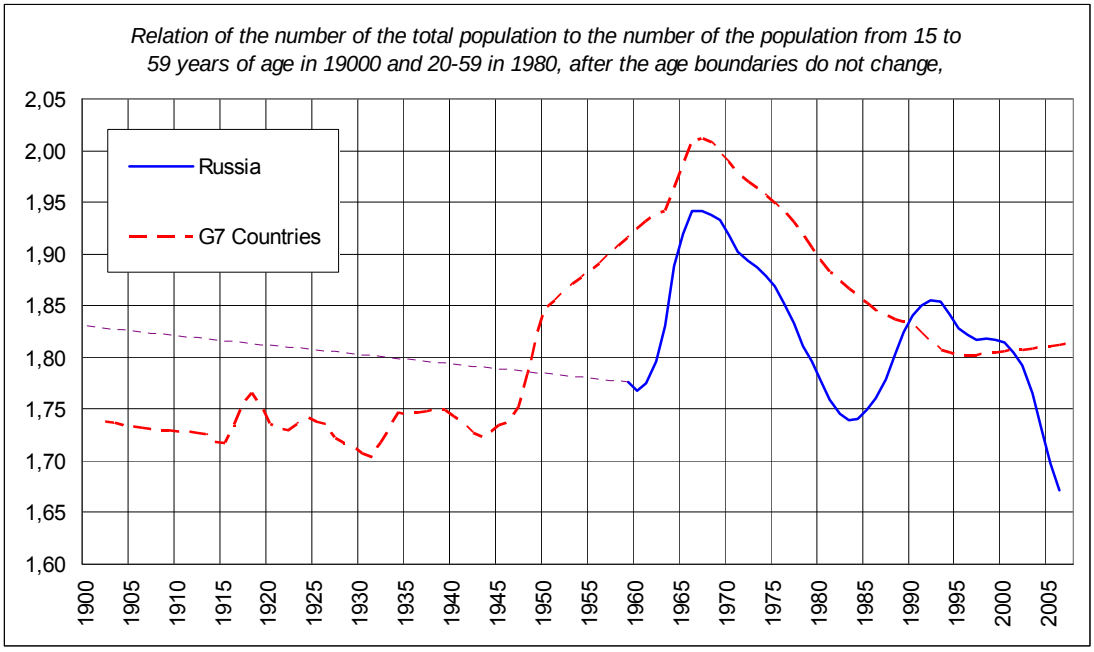


Qualitative differences of the situation prevailing in the demographic sphere of Russia and other developed countries, are manifested in the fundamentally different nature of the relationship of **LDLE** and TFR indicators. Figure 8 presents data showing that the nature of demographic processes in Russia has a unique form.

Qualitative differences between the nature of demographic changes in the internal demographic structure of the RSFSR/Russia are not limited to the provisions considered above. Let's draw attention to the fact that in the period that allows to conduct a comparison according to Russia's and world statistics, i.e. the last fifty

years, the rate of change of dynamics of **LDLE** for the G7 countries and Russia were very significantly different (see Figure 9).

Figure 9. Average values of LDLE[5].



Thus, for the G7 countries, the absolute value of fluctuations in **LDLE** (sum of absolute values of deviations during the researched period) over the last century amounted to 0.45, while for the RSFSR/Russia just over fifty years - 0,63. Average rate of change of the **SDWL** indicator in the RSFSR/Russia for fifty years (from 1958 to 2007) is 2,2 times higher than in the G7 group of countries over the same period of time. It is possible to assume that the change in the demographic load of employable people in a significant range over a relatively short period is a significant factor contributing to the formation of stresses in the social sphere of society. On the other hand, the stability of this indicator contributes to the formation and maintenance of a comfortable social environment.

Our research has allowed to form a hypothesis about a relationship between changes in speed and direction of the **LDLE** vector with the characteristics of the socio-economic status, which any particular society finds itself. Large amount of information, which we posses, allows to approach the identification of certain trends in the designated area, naturally, if they really exist.

We can assume that the qualitative characteristics of the social situation in society primarily depends on the direction of the vector and the characteristics of the dynamics (amplitude, oscillation frequency) of **LDLE**, insofar as it relates to a change in living standards. It seems reasonably clear that the changes in demographic loads of employable people, should have (other things being equal) the impact on the formation processes, distribution and redistribution of national income, and ultimately - efficiency of operation of the economic system of the

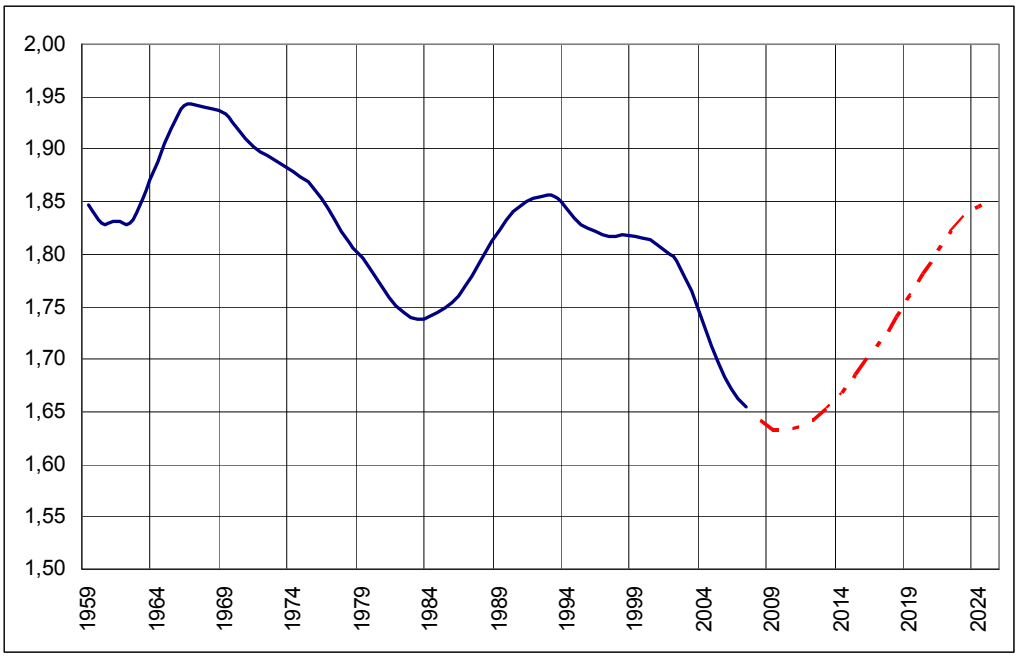
[5] Source: www.mortality.org

country as a whole and as a consequence, the political and social stability in society.

Reduction of **LDLE** leads to increased consumption by reducing the number of dependents on the employable population, and vice versa. Co-relations which include the variations of the indicator of specific demographic load of the employed and the specific level of material consumption needs careful study. However, we can assume that the relationship of these variables has a more complicated shape than a simple linear relationship.

Analysis of dynamic characteristics of the **LDLE** indicator, reflected in Figure 10, allows to compare the changes of the demographic situation in the USSR/Russia with the fluctuations taking place in the economic situation of our country in the last fifty years. This analysis allows

Figure 10. Actual data and forecast of changes in LDLE for Russia.



To come to a conclusion on the fact that changes of the level of demographic load on the employed, significantly influenced the nature of political, social and economic processes that took place in the territory of USSR/Russia in the last fifty years of our history.

Let's select the periods of sharp fluctuations in the value of **LDLE** in this time interval (1958-2008).

Period 1958-1964.

In this period there was a significant increase of **LDLE** at speeds of more than 1% per year.

Growth of the relations of dependents and employable (+6.2%) affected the relative (i.e., without taking into account other factors) reduction in the level of consumption in the country.

The end of the period coincided with changes in the higher echelons of power in the USSR. Recall: in the September (1964) Plenum of Central Committee of the Communist Party of the Soviet Union, Khrushchev N.S. was sent into resignation.

Period 1967-1980.

These years saw a noticeable decline in the level of demographic load of the employed (- 8,5%) and, consequently, due to this factor formed the relative growth of consumption.

As a result, relatively prosperous situation in the economy and political stability in society formed the so-called «the period of stagnation».

Period 1983-1992.

Without taking into account all the well-known external and internal economic factors, decline in consumption of the employable population of the USSR was secured by a significant increase in the **LDLE** rate (+7.6%).

Completion of this period coincided with political upheavals of the beginning of the 90-ies of the last century.

Period 2000-2007.

In this period of time, there was the recording during the period available for observation (1958-2009) of the unprecedented rate of reduction of demographic load on the employed - more than one per cent per annum (!)

We can therefore conclude that the favorable external environment for Russian export combined, in these years, with the positive dynamics of the considered by us demographic factor, which obviously did a lot of aid to the increasing welfare of the country under President V.V. Putin.

Forecast calculations (see Figure 10) show that Russia is now entering a new stage of quite drastic growth of **LDLE**. This growth will not only be the most important of all previously recorded by us, under Russian demographic statistics (13.3%), but also the longest - 15 years. Changes in trends can be expected only in 2025.

Developments in the next half decade will represent most urgent problem to Russia, as the demographic trend will change at its root. From being positive in 1993, it becomes negative. This is the essence of «problem 25».

Additionally, we note that the presented, in this work, objective data suggest that the specificity of Russia, which distinguishes it from the nature of the processes that take place within it from countries with established market and democratic institutions are likely to actually exist.