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Changes in Demographic Behaviour of Households Following the Recent Socio-Economic Transformation in Belarus

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Abstract

Recent economic difficulties, the decline in living standards, the spread of unemployment and poverty in Belarus have all produced significant changes in the quality of life of individuals and modify their economic activities, lifestyles, values and behaviour. These are reflected in a decline in the average size of household and in the growth of a variety of household types. This paper aims at exploring and analyzing the changes in the demographic behaviour of the households following the socio-economic transformation in Belarus during the last decade of the 20th century. The discussion focuses upon the evaluation of recent developments in the well-being of households by using several poverty and inequality measures. The analysis of the relationships between different demographic and socio-economic variables is carried out by applying advanced statistical methods, such as principal components and stepwise multiple regression analyses.

INTRODUCTION

Most of the countries in Central and Eastern Europe and the former Soviet Union Republics have been experiencing a severe and, in most cases, long-term transformation crisis triggered largely by three factors: the disintegration of the old economic system, the collapse in trade with other states in the region, and the increasing need to adjust to the competitive demands of the world economy. Unemployment, a rise in poverty, and socio-economic differentiation of population have become problems of major social concerns and have contributed to the basic changes in all spheres of life and demographic development. Formation of new lifestyles and values, changes in demographic behaviour of households, particularly family formation and preferences, are among the most socially significant consequences of the transitional period attracting the attention of many researchers.

An assessment of the impact of transition on changes in the demographic behaviour of households appears to be a tough task. It is particularly difficult to measure empirically the strength of association between different socio-economic and demographic variables due to the complexity and the nature of such relationships. A wide variety of variables and interactions among them influence demographic processes. Although many attempts have been made to establish a theoretical explanation of changes in the demographic behaviour of the population under the new socio-economic conditions, few studies have reached consistent conclusions. Among them there is the study of fertility in times of discontinuous societal change in Central and Eastern Europe, conducted by Philipov (2002). In his analysis, the author has found that the collapse of countries' economies did not overpass demographic events, such as fertility, marriage and formation of new households and family types. He mentions several explanations of these relations which have been discussed by different demographers. Some of them find that the economic difficulties of the transition are the primary cause of the new demographic trends. Indeed, the pervasive economic decline has brought about a considerable increase in the cost of rising of children. Others argue that the drop in fertility is basically the result of long-standing ideational changes that have started developing before the start of the transition. The latter has only contributed to their rise to the surface and accelerated their intensity and diffusion. Both approaches give a valuable insight to the understanding of recent fertility changes in the countries of the region. The author argues that the two grand approaches do not incorporate in full the quintessence of the transition, describing it in general terms. It presents a broad theoretical framework that fits the specifics in the economic and ideational development in the region.

The same as in several countries of Central and Eastern Europe and the former Soviet Union, the process of the socio-economic transformation in Belarus has been involved with many challenges of the transition: macroeconomic and financial instability, inefficiencies of the state-owned enterprises, hyperinflation and unemployment growth, decline in the well-being of the population, and growth of social discontent.

Coincidence in timing for the socio-economic crisis following the recent transition of Belorussian economy towards market economy and negative demographic trends (growing mortality, sharp decline in fertility, ageing, unbalanced sex and age structure of the population) gives a reason to suggest that there is a causal link between these events. Indeed, recent socio-economic changes seem to be responsible for rapidly modifying demographic behaviour of Belorussian households, the exploration and analysis of which is the main objective of this paper.

DATA SOURCES

The intended analysis is mainly based upon data of the "Income and Expenditures of the Households" sample survey (IEHS) conducted annually by the Ministry of Statistics and Analysis of the Republic of Belarus (Minstat) since January 1995. This survey is a part of the regular operations of the Ministry and represents the major source of information on the socio-economic status of Belorussian households.

Each year a sample of about 6000 households is selected. The survey covers all types of households with the exclusion of collective households (persons living in institutions like nursing homes, boarding schools, etc.). Each sampled household has a known probability of selection, so that sampling weights can be constructed and estimates, representative of the population, can be obtained.

Since IEHS was initially designed as a source of information about household income and expenditures, the number of demographic variables in the survey questionnaire is limited. Nonetheless, IEHS is perhaps the only one source of information that contains both socio-economic and demographic variables. This gives an opportunity to explore the relationship between them and facilitates applying advanced statistical techniques. Data derived from the last two Population Censuses (1989 and 1999) together with the other official statistics, provided by the Ministry of Statistics and Analysis, are utilized for the purpose of the present study as complementary sources of information.

METHODOLOGY

Studying household's well-being is based on their ranking by per capita disposable resources into quintiles (20% groups) and on the analysis of inequality indicators, such as Lorenz curve, Gini index and index of living standards. Index of living standards is constructed from the information on household ownership of durable goods and its housing characteristics. It is calculated using a Principal components analysis, which is a statistical technique for extracting those few orthogonal linear combinations of the variables that best capture the common information from a large number of variables. The first principal component is assumed as the linear index of variables with the largest amount of information common to all of the variables. The result of principal components is an asset index for each household (*Aj)* which is calculated by the formula:

$$A_j = f_1 \times \frac{a_{j1} - a_1}{s_1} + \ldots + f_N \times \frac{a_{jN} - a_N}{s_N} \qquad (1)$$

where for each household A_j:

f_1 is the scoring factor for the first asset as determined by the procedure,

a_{j1} is the j^{th} household's value for the first asset,

a_1 and s_1 are the mean and standard deviation of the first asset variable over all households,

N is total number of assets included in the procedure.

In order to explore the major determinants of inequality in the level of per capita disposable resources among households, the multiplication model, which incorporates several socio-economic and demographic variables, is applied.

The stepwise multiple regression analysis is applied as an attempt to examine empirically the strength of the relationships between socio-economic and demographic variables. This type of analysis employs one of several available statistical algorithms to order the entry (and/or deletion) of predictors from the model being constructed.

SOCIO-ECONOMIC DEVELOPMENT OF BELARUS

Belarus, whose economy was for a long time an integral part of the national economic complex of the Union of Soviet Socialist Republics (USSR) was considered to be one of the most prosperous republics in a privileged position relative to other republics of the former USSR. Among 15 soviet republics Belarus ranked well on many key socio-economic indicators: national per capita income (4-th), industrial production (3-rd), monetary income of the population (1-st), and life expectancy (3-rd) (NIHE, 2000). Extensive social investments guaranteed almost universal literacy and employment; the existence of poverty was not officially recognized.

Occupying 0.9% of the ex-USSR territory, with 3.6% of its population and 3.4% of fixed assets, Belarus accounted for 4% of the Union's Gross Domestic Product (GDP), 4.5% of its industrial output and 5.6% of its agricultural output. In 1990, the government's spending on cultural and social programs was fully covered by incomes, and surplus of incomes over expenditures that equaled 2.3% of GDP; the consumer price index in 1990 equaled just 103.9%. In 1991 and 1992, Belarus ranked 40th among 174 countries by its human development index (HDI) and was listed among those with a high HDI ranking (UNDP, 2000).

In spite of the quite positive macro-economic indicators of the socio-economic development, a large proportion of Belorussians were not thoroughly satisfied with many aspects of their daily lives. The shortage of consumer goods, poor availability of personal services, and the exigent necessity of spending considerable amounts of time in lines for essential goods were among the major concerns of the ordinary Belorussians. Furthermore, low-efficient economic system created in Belarus under the Soviet rule revealed the signs of deterioration in the middle of the 1980's. As the USSR economic growth began to decline, the technological development slowed down, and as a result, the growth of the living standards of the population almost stopped.

The collapse of the Soviet Union in 1991 led to a deep economic crisis which was characterized by macroeconomic and financial instability, inefficiencies of the state-owned enterprises, downfall of productivity, hyperinflation and unemployment growth, and drastic decline in the well-being of the population.

The newly independent state of Belarus inherited an industry that had served the needs of the whole USSR and was too burdensome for a small country to maintain. Technological disadvantages, rising prices of fuel and raw material, high inflation along with a poor quality of production decreased the competitiveness of Belorussian goods and services in the world market. Other factors contributing to the economic crisis were the rising trade deficit, financial shortages, falling investments, and the extremely limited capacity to modernize industry, slow progress of privatization and restructuring, and lack

of incentives for the private enterprises. In addition, Belarus had to deal with the severe aftermath of the Chernobyl nuclear accident. There was also a shortage of qualified personnel and particularly of a managerial staff capable of working within the market system.

The economic development of Belarus since its independence up to the present time has passed through three major stages. The first stage (1990-1995) was dominated by drastically declining GDP, macroeconomic chaos, hyperinflation, large budget deficits, loss of control over economic developments and attempts to combine new market mechanisms with the old institutions. In 1992, the liberalization of prices led to an acute financial crisis and galloping inflation. In 1993, deficit of the consolidated budget reached its unprecedented level of 5.5% of GDP (Minstat, 2004).

Between 1990 and 1995 the annual fall in GDP constituted 8.2% and as a result almost all main indicators of socio-economic development were markedly below their initial levels of 1990. In 1995, GDP constituted only two-thirds of its level of 1990; industrial output and capital investments decreased by about 40 and 60%, respectively (Table 1).

Table (1)
Indices of the Main Socio-Economic Indicators of Belarus, 1990-2003
(at constant prices; in percent to 1990)

Indicator	1990	1995	1997	2000	2003
Gross domestic product (GDP)	100	65	75	89	104
Industrial output	100	61	75	101	119
Agricultural output	100	74	72	71	78
Capital investments	100	39	45	52	65
Consumer price index (previous year=100%)	-	344	163	208	125
Paid services rendered to households	100	36	41	54	71
Real disposable incomes of the population	100	62	77	107	153
Real average monthly wages and salaries	100	56	67	95	137
Real monthly pensions	100	60	66	98	142
Unemployment rate (%)	0.05	2.9	2.8	2.1	3.1

Source: Minstat (2004). Statistical Year Book of the Republic of Belarus

Income disparities increased tremendously over that period. Real incomes in 1995 equaled 62% of the 1990 level. Throughout the crisis period, capital was migrating from production to trade and commerce, which offered disproportionately higher and faster return on investment in conditions of high inflation. The first stage was a period of intense redistribution of capital, facilitated by inflation and massive consumer import from Western Europe.

The main attribute of the second stage (1995-2000) was the uncontrolled monetary emission not supported by economic growth, which caused deep inflation processes in Belarus. An inflation-creating economic policy, introduced in 1997, was characterized by the differentiation of exchange rates, the absence of free foreign exchange markets, and administrative price control. Discrimination against private business became widespread and a new economic class emerged, a class of people whose main income was derived from the extensive subsidy system.

The third stage (2000 up to the present) has been characterized by some improvements of the main socio-economic indicators. Belarus gradually reduced average annual inflation growth from almost 108% in 2000 to 25% in 2003. Regarding structural reforms during the past several years, the exchange market was liberalized, most administrative price controls were removed, energy sector cross subsidization was sharply reduced, and licensing requirements were streamlined. In comparison to other republics of the former USSR, Belarus has been relatively successful in terms of GDP growth. Real GDP has been growing for almost ten years without interruption. In the latest UNDP Human Development Report (UNDP, 2004) Belarus was included among the middle-income countries and ranked 62nd in the World.

Nonetheless, the process of transition in Belarus is still far from complete. Among the former Soviet republics Belarus remains one of the slowest reforming countries. The economy continues to be predominantly state-owned, and the state sector is under constant strain (around one third of all Belorussian enterprises and organizations in 2003 were loss making) (Minstat, 2004).

Although Belarus has taken positive steps towards stabilizing its economy, it continues to have the highest inflation among the republics of the former USSR. The slow progress in the structural reforms, and in particular unfavourable business environment, raise doubts about sustainability of the GDP growth. The Belorussian authorities have chosen a slow path of economic reforms as a means of ensuring that important social objectives are not undermined during the transition to a market economy. Although the authorities' concerns about the social consequences of transition are quite understandable, the costs of gradualism, which include lower growth and deteriorating living standards in the long run, would be outweighed by the benefits of market reforms.

HOUSEHOLD WELFARE, INEQUALITY AND POVERTY IN BELARUS

The negative changes in the economy that took place in Belarus eventually affected the welfare and the socio-economic state of the households. According to the results of IEHS, during 1995-2003 the main sources of household income were salaries, which constituted 65-67% of the total money income, and pensions, student grants and other benefits (24-25%). The share of expenditure on food, which illustrates consumer capabilities of the households, constituted about half of the total consumer expenditures, while in developed countries this indicator doesn't exceed even a quarter.

Due to the difficulty in obtaining unbiased and reliable data on household income in Belarus, an indicator of disposable resources is used as a substitution in the analysis of poverty and household welfare. In addition to the total amount of cash resources, which households spend for their consumption and savings, disposable resources include the value of consumed in-kind income obtained from the individual land plots less the expenses of its production and also the value of in-kind subsidies and benefits.

IEHS data reveal that the distribution of disposable resources in Belarus has become increasingly unequal. For instance, the Gini index increased from 0.26 in 1995 to 0.34 in 2003. In 2003, the poorest households accounted for 7% of the total amount of disposable resources (Table 2), while the richest households accounted for more than one third (38.9%).

Table (2)

Percentage Distribution of Household Disposable Resources and its Components in Belarus by Quintiles, 2003

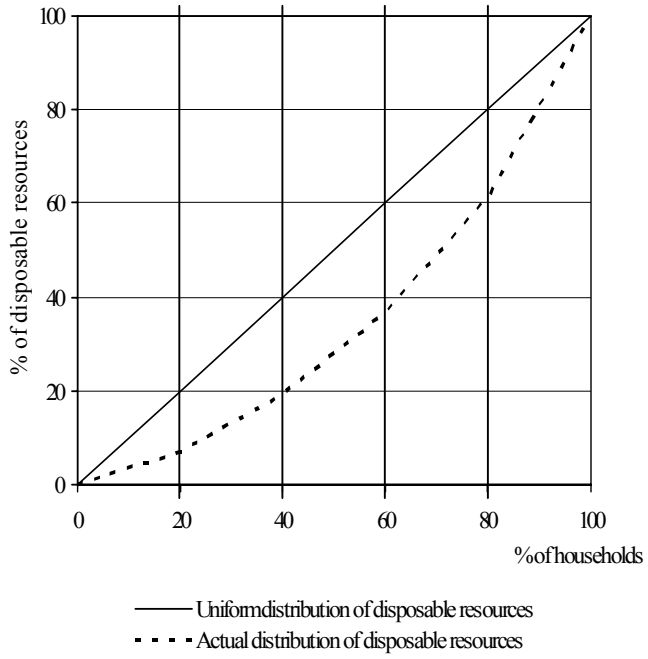
Quintiles	Disposable resources	Money resources	In-kind income from land plots	In-kind privileges
First	7.0	6.6	9.5	9.2
Second	12.3	11.8	16.4	14.5
Third	17.6	17.3	20.7	19.3
Fourth	24.2	24.0	25.7	25.5
Fifth	38.9	40.3	27.7	31.5
Total	100	100	100	100

Source: Calculated from IEHS data

Graphically, the inequality in distribution of disposable resources among households is represented by the Lorenz Curve (Figure 1).

Figure (1)

Inequality in Distribution of Disposable Resources of Households by Quintiles in Belarus, 2003 (Lorenz Curve)



Source: From IEHS data

The average per capita disposable resources of the household in the first quintile in 2003 was 80.8 thousand Belorussian rubles (approximately US$38) or 3.8 times less compared with average resources of the household in the fifth quintile (308.2 thousand rubles or US$143).

The level of household resources depends on a number of factors, such as: measure of dependency, labour market participation, labour income per income earner, ratios of

total money income to labour income and of disposable resources to total money income. The analysis of variation in the level of per capita disposable resources between the lowest and the highest quintiles may be carried out by using the following multiplication model:

$$\frac{DR}{HS} = \frac{PWA}{HS} * \frac{IE}{PWA} * \frac{LI}{IE} * \frac{TMI}{LI} * \frac{DR}{TMI} \qquad (2)$$

Where, **DR** – Household disposable resources

HS - Household size

PWA - Persons of working age in a household

IE - Number of income earners in a household

LI – Household labour income

TMI – Household money income

Note: Males aged 16-59 and females aged 16-54 refer to the population at working age

The values of each factor for the first and the last quintiles are shown in table (3).

Table (3)
Values of the Model Factors by Quintiles; Belarus, 2003

Label	Factor	First quintile	Fifth quintile
PWA / HS	Number of persons of working age in a household per the total number of persons in a household (factor 1)	0.5451	0.6806
IE / PWA	Number of income earners in a household per number of persons of working age in a household (factor 2)	0.7383	0.9588
LI / IE	Labour income of a household per number of income earners in a household (factor 3)	108756	260035
TMI / LI	Total money income of a household per labour income of the household (factor 4)	1.6989	1.3967
DR / TMI	Disposable resources of a household per total money income of the household (factor 5)	1.0717	1.2611
DR / HS	Disposable resources of a household per total number of persons in the household (per capita disposable resources)	79691	298903

Source: Calculated from IEHS data

In order to determine the factors' contributions to the overall difference in per capita disposable resources between the first and the fifth quintiles, the values of both sides of the equation (2) were transformed using logarithms (Table 4).

Table (4)

Decomposition of Difference in Per Capita Disposable Resources between the First and the Fifth Quintiles; Belarus, 2003

Factors	Log values		Difference	Share of each factor in total difference, %
	First quintile	Fifth quintile		
Factor 1	-0.2636	-0.1671	0.0965	16.8
Factor 2	-0.1318	-0.0183	0.1135	19.8
Factor 3	5.0365	5.4150	0.3785	65.9
Factor 4	0.2302	0.1451	-0.0851	-14.8
Factor 5	0.0301	0.1008	0.0707	12.3
Per capita disposable resources	4.9014	5.4755	0.5741	100

Source: Calculated from IEHS data

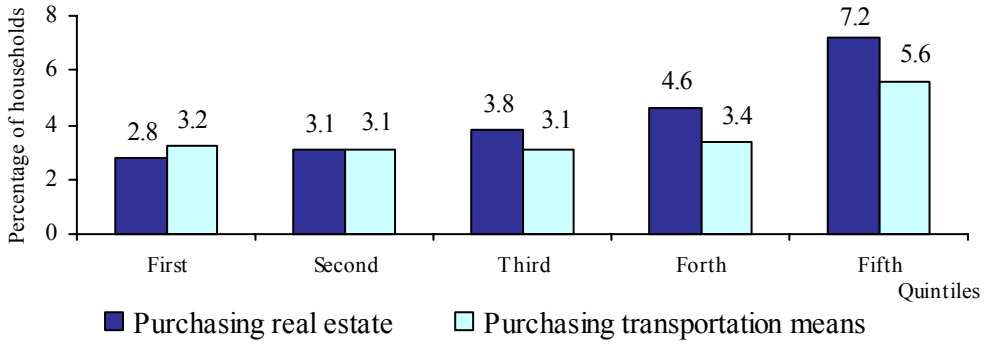
The first factor, which represents the ratio of persons of working age to the total household size, is positive, indicating that households in the fifth quintile have a lower dependency ratio than households in the first quintile. Similarly, the richest households have more persons participating in the labour market, a much higher level of income per earner and a higher ratio of disposable resources (i.e. consumption and savings) per total money income than the poorest households.

Offsetting its smaller share of labour income per person of working age and higher level of dependency, the households with the lowest level of per capita disposable resources have a higher share of nonlabour income (pensions, benefits, alimony, etc.) out of the total money income they have received.

According to the results, the average level of labour income is the main factor, which determines about two-thirds of the difference in per capita disposable resources between the selected quintiles. Labour participation occupies the second place in the line of importance and accounts for about 20% of this difference while the presence of persons below and above working age in a household explains 16.8% of the difference. The factor, which may be defined as a measure of unreported income, determines just 12.3% of the difference. The presence of the nonlabour income sources in the poorest households decreases the difference in the level of per capita resources between the first and the fifth quintiles by approximately 15%.

The possession of such material components as property, especially all kinds of real estate and means of transportation, is rather an important constituent part of the household's economic potential and significant indicator of living standards and social stratification. According to the IEHS in 2003, the share of households who purchased different types of real estate or transportation means was much higher among the 20% group of households with a higher level of resources than among households in the first quintile, as the following figure shows.

Figure (2)
Percentage of Households which Purchased Real Estate or Transportation Means in Belarus by Quintiles, 2003



Source: From IEHS data

Nowadays, proper access to housing is becoming more essential in Belarus. More than one quarter of all households are in need of new housing, but most have to wait for ten to fifteen or more years to be just put on a waiting list. These households live in communal flats, dormitories and dilapidated houses, often in crowded conditions. In 2003, almost sixty percent of households with the lowest resources had an average size of per capita dwelling space less than 13 sq.m. (Table 5), while about three quarters of the households with the highest level of resources lived on a space 13 and more sq.m. per person.

Table (5)
Percentage Distribution of Households in Belarus by Quintiles and Size of Dwelling Space, 2003

Quintiles	Total number of households	of which with per capita size of dwelling space, sq.m:			
		under 5	5-12	13-19	20 and over
First	100	5.1	54.8	24.1	16.0
Second	100	3.6	41.6	27.3	27.5
Third	100	2.0	42.0	28.3	27.7
Fourth	100	1.9	35.3	29.8	33.0
Fifth	100	0.9	26.1	36.3	36.7

Source: Calculated from IEHS data

The presence of a number of housing supplies in households with different levels of income confirms unfavourable living conditions of the poor households in Belarus. In 2003, just about 53% of them had hot water, 57.4% - bath, about 70% - central system of heating and just 55% - telephone (Table 6).

Table (6)
Percentage of Households in Belarus by Quintiles, and Presence of Housing Supplies, 2003

Quin-tiles	Share of households possessing:					
	central heating	sewerage	running water	hot water	bath or shower	telephone
First	68.7	65.8	69.7	52.7	57.4	55.0
Second	73.6	68.4	72.0	57.2	60.8	69.6
Third	77.6	73.8	77.5	65.2	67.8	77.9
Fourth	83.6	81.3	84.4	73.6	75.8	84.9
Fifth	91.1	90.1	91.6	84.0	86.1	88.5

Source: Calculated from IEHS data

The level of per capita household disposable resources directly affects their possession of different durable goods. In 2003, almost all households with the higher level of resources owned TV-sets and refrigerators, about 80 percent of them had washing machines and more than one third (37%) possessed a car (Table 7).

Table (7)
Percentage of Households in Belarus by Quintiles and Possession of Selected Consumer Durables and Land, 2003

Quintiles	Share of households possessing:				
	TV-set	refrigerator	washing machine	land	car
First	91.5	87.7	59.0	64.7	12.5
Second	95.7	94.3	65.9	64.6	19.4
Third	96.8	97.5	73.4	63.6	24.0
Fourth	98.8	98.3	78.3	58.4	28.9
Fifth	98.8	97.4	77.9	53.6	37.0

Source: Calculated from IEHS data

The larger share of these items was gained before the year 1991 (the starting point of the economic crisis in Belarus). For example, after this period of time, only 44% of the total reported TV-sets, 26% of refrigerators and 18% of washing machines were bought.

The possession of any land plot is more common recently among the poorest households. In 2003, about two-thirds of them owned an agricultural land and used it as a means of foodstuff production. Due to the scarcity of money resources and the skyrocketing prices, households have to find any source of income in order to meet their basic needs.

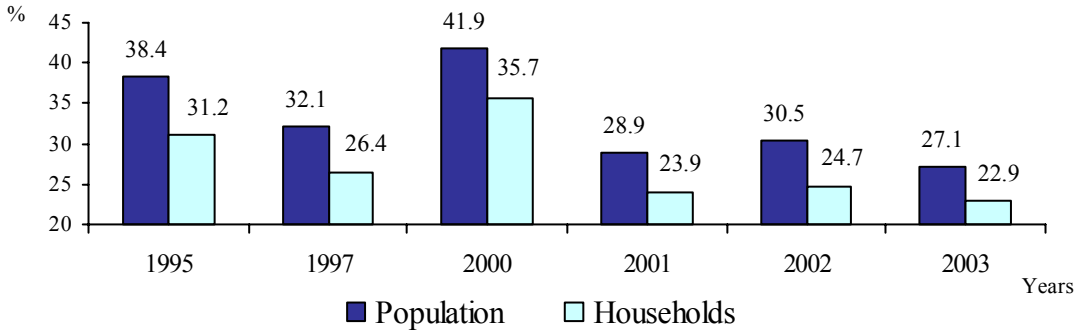
Among the different indicators, reflecting the living standards of the households, the index of living standards is considered to be the most convenient one. The construction of this important summary measure is based on applying a Principal components analysis; scoring factors and summary statistics for variables entering to the computation are given in appendix (1). The difference in the average index between the poorest and the wealthiest groups of households constituted 0.36 unit in 2003, which may be produced by a combination of assets, such as owning a car (0.25 unit) or telephone (0.33), presence of a bath (0.29), hot water (0.28) or central heating (0.22) (Appendix 2).

The growing level of inequality in income distribution at the beginning of the economic transformation period in Belarus was accompanied by an increase in poverty. Until 1999 the assessment of poverty in Belarus was carried out by using the normative method, according to which the poor were identified as people whose income was less than 60% of the minimum consumer budget. The law "On the Subsistence Minimum", adopted in 1998, created a current legal framework for the definition of minimum subsistence and, consequently, poverty level. Starting from January 1999, all individuals (households) with incomes below the budget of minimum subsistence level have been qualified as poor and have been eligible for support. Minimum subsistence budget has been defined as the amount of money for the set of material goods and services necessary to meet minimum physiological and social needs of people.

Since the size of an ordinary poor household is traditionally bigger than average, the estimated share of the population below the poverty line exceeds the proportion of poor households. Nonetheless, both measures, proportion of poor population and proportion of poor households, are used for different purposes in the preliminary analysis of poverty.

Years of aggregate economic contraction and rising inequality created a high incidence of income poverty in Belarus by the mid 1990's. In 1995 about 40% of population and more than 30% of households were recognized as poor (Figure 3).

Figure (3)
Percentage of Poor Population and Households in Belarus, 1995-2003



Source: Minstat (2004). Statistical Year Book of the Republic of Belarus.

There is a noticeable decrease in the level of poverty in Belarus during 1995-2003, except for the year 2000 when poverty reached its highest level. According to the results of the IEHS, 41.9% of the population and 35.7% of the households had incomes below the poverty line. Such high level of poverty is explained by the consequences of the economic crisis in Russia in 1998. In 2003, 27.1% of the population and 22.9% of the households that were recognized as poor, decreased by around ten percentage points from their levels of 1995 (38.4% and 31.2%, respectively).

The problem of poverty in households with children is especially pronounced in Belarus; during 1995-2003 they constituted about 55-65% of the total number of poor households. Data indicates that not only single parent households (typically headed by women) but also households with two and more adults have an elevated relative risk of poverty and this risk increases with the growing number of children in a household. In 2003, about 72% (Table 8) of the households consisting of two adults with three and more children were under the poverty line (versus 68.2% in 1995).

Table (8)
Poverty in Belarus by Household Type, 1995-2003 (percent)

Household type	Poverty rate				Composition			
	1995	1997	2000	2003	1995	1997	2000	2003
Single households	14.3	15.9	21.7	14.0	9.4	13.3	13.3	14.9
Households without children	22.0	20.2	29.7	18.6	23.2	25.5	29.6	29.1
Households with children	45.1	36.1	47.8	31.5	67.4	61.2	57.1	56.0
2 and more adults	45.4	36.8	48.3	32.1	61.4	55.8	51.0	49.4
1 child	36.7	28.4	39.9	22.7	25.7	22.5	25.1	19.1
2 children	52.2	41.2	57.2	39.4	28.7	24.9	20.6	24.1
3 and more children	68.2	71.4	81.2	71.8	7.0	8.4	5.3	6.2
1 adult	42.1	29.9	43.4	30.1	6.0	5.4	6.1	6.6
1 child	31.6	23.5	37.0	20.4	3.0	2.6	3.7	3.4
2 and more children	62.2	39.9	58.3	49.9	3.0	2.8	2.4	3.2
Total	31.2	26.4	35.7	22.9	100	100	100	100

Source: For 1995 and 1997 –Minstat (2001). Socio-Economic Characteristics of the Households in the Republic of Belarus. Statistical Book; for 2000 and 2003- Calculated from IEHS data

Notes: The poverty rate is the percentage of all households in a group who are poor out of the total number of households belonging to that group.

Composition is the percentage of the number of poor households with given characteristics out of the total number of poor households.

Another evidence of the acuteness and depth of the poverty problem among households with children is the duration of their being under the poverty line during a year. Like the majority of the households, during 1995-2003 the highest proportion of them were poor from four to nine months (Table 9). At the same time, single households and household without children had in general short-term duration of poverty (1-3 months), while the significant proportion of the households with two and more children was under the poverty line almost entire year.

Table (9)
Distribution of Different Types of Households in Belarus by Duration of Poverty, 1995-2003 (in percent)

	1995			2000			2003		
	1-3 months	4-9 months	10-12 months	1-3 months	4-9 months	10-12 months	1-3 months	4-9 months	10-12 months
Single households	21.4	17.6	4.9	40.0	41.8	18.2	16.9	17.2	5.2
Households without children	23.1	24.9	7.5	20.8	42.6	36.6	14.0	17.6	8.0
Households with children	19.7	36.4	21.1	31.0	43.7	25.3	16.0	24.5	15.5
1 child	22.4	33.9	14.7	23.8	44.2	32.0	16.7	20.9	10.8
2 children	17.4	39.7	25.3	18.6	43.1	38.6	15.4	28.4	21.9
3 and more children	13.5	36.8	44.9	5.6	28.6	65.9	10.0	44.1	34.8
Total	21.2	28.8	13.3	27.7	42.6	29.7	15.5	20.1	10.2

Source: For 1995 and 2000 –Minstat (2001). Socio-Economic Characteristics of the Households in the Republic of Belarus. Statistical Book; for 2003 - Calculated from IEHS data

Inadequate level of household disposable income, lack of assets and real estate, shortage of living space and housing supplies reflect altogether unfavourable economic conditions of the households and generate a strong impetus for the subsequent change in demographic behaviour of the population.

DEMOGRAPHIC CHANGES

Being affected by significant socio-economic changes, the demographic processes in Belarus have acquired new features: decrease of population, decline in life expectancy, growth of mortality rate, ageing of the population and large decline in fertility level. The population of Belarus reached a peak of 10239.1 thousand in 1993, but declined thereafter recording 9898.6 thousand on 1 January 2003 (Table 10). Such a decline was mostly due to the excess of the number of deaths over that of newborns.

Table (10)
Main Demographic Indicators in Belarus, 1990-2003

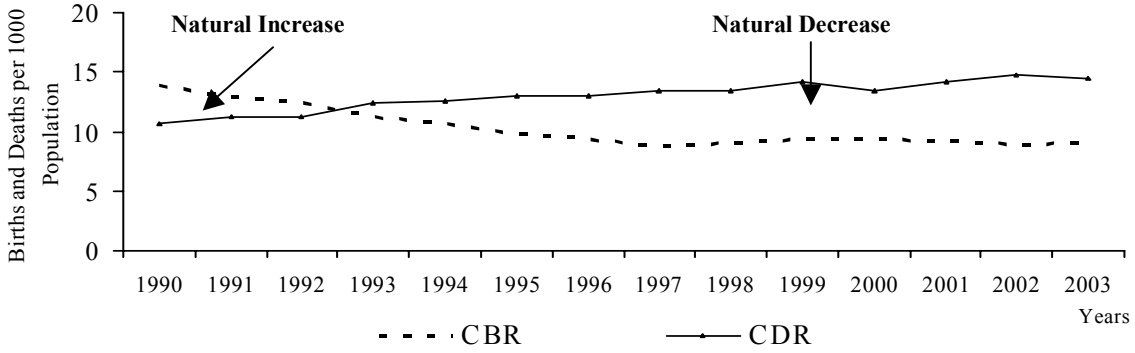
Indicator	1990	1995	1997	2000	2003
Total population as of 1 January (in thousands)	10188.9	10210.4	10141.9	10019.5	9898.6
Crude birth rate (‰)	13.9	9.8	8.9	9.4	9.0
Crude death rate (‰)	10.8	13.1	13.5	13.5	14.5
Rate of natural increase (‰)	3.1	-3.3	-4.6	-4.1	-5.5
Total fertility rate (children per woman)	1.913	1.406	1.250	1.310	1.206
Life expectancy at birth (in years):					
both sexes	71.1	68.6	68.5	69.0	68.5
males	66.3	62.9	62.9	63.4	62.7
females	75.6	74.3	74.3	74.7	74.7

Source: Minstat (2004). Statistical Year Book of the Republic of Belarus

The crude birth rate was 13.9 per thousand population in 1990 and decreased by 35.7% reaching 9 per thousand population in 2003. The number of births in 2003 was just 62.2% of its level in 1990. The recorded total fertility rate in 2003 was 1.206 children per woman, a level which is much lower than the replacement level. The economic explanation of the reduction in fertility is based on the escalation in the direct cost of children as a consequence of the decline in level of disposable resources.

The growing level of mortality in Belarus aggravates the problem of decreasing the level of reproduction. The crude death rate increased from 10.8‰ in 1990 to 14.5‰ in 2003 or by 34.3%. The changes in birth and death rates during 1990-2003 are graphically represented in figure (4).

Figure (4)
Crude Birth and Death Rates in Belarus, 1990-2003



Source: Minstat (2004). Statistical Year Book of the Republic of Belarus.

The increase in the mortality level and the worsening of health conditions of the population resulted in the diminution of life expectancy at birth in Belarus. In 2003, this indicator was 68.5 years, declining by about 3 years from its level in 1990 (table 10 above). Moreover, in the same year the life span of men was shorter than that of women by 12 years.

The extremely low fertility level and sex differentials in the level of mortality led to the unusual age-sex structure of the population. The present age-sex composition is characterized by an increased proportion of the elderly, a decreased proportion of children and the predominance of female population in the old age groups (Table 11).

Table (11)
Percentage Distribution of Population in Belarus by Sex and Selected Age Groups; 1989 - 2003

Percentage of the total population:	1989			2000			2003		
	total	males	females	total	males	females	total	males	females
under working ages	24.5	26.6	22.6	19.6	22.0	17.8	17.7	20.3	15.6
of working ages	56.0	61.9	50.8	58.2	62.5	54.5	59.8	64.7	55.6
above working ages	19.5	11.5	26.6	22.2	15.5	27.7	22.5	15.0	28.8
Total	100	100	100	100	100	100	100	100	100

Source: For 1989 - Minstat (2001). Population of the Republic of Belarus. Statistical Book; for 2000 and 2003- Calculated from IEHS data.

Notes: Population data for 1989 are taken from the 1989 Census.

Males and females at the age under 16 refer to under working age population; males aged 16-59 and females aged 16-54 refer to working age population; males aged 60 and over and females aged 55 and over refer to above working age population.

A summary measure of the age structure, such as the median age, reflects the general shift in age distribution, which has accompanied changes in fertility levels. During the last decade, the median age of the population increased from 32.2 years in 1989 to 39 years in 2003 (or by 21.1%). It indicates and once again corroborates a decreasing youthfulness of the Belorussian population.

Table (12)
Median Age in Belarus by Sex;1989-2003
(number of years)

Years	Both sexes	Males	Females
1989	32.2	30.4	35.0
2000	37.0	34.0	40.0
2003	39.0	35.0	41.0

Source: For 1989 – Minstat (2001). Population of the Republic of Belarus. Statistical Book; for 2000 and 2003- Calculated from IEHS data.

Note: Population data for 1989 are taken from the 1989 Census.

Changes in age structure and fertility level obviously have an impact on the age dependency ratios, which shows the relationship of the dependents in a population and those they depend on for their sustenance. The young-age dependency ratio declined by 32%, but it did not decrease the total dependency ratio considerably because the losses in the younger population were compensated by an increase in the older population. The old-age dependency ratio for the given period of time grew from 15.6% in 1989 to 21.9% in 2003 or by 40.4% (Table 13).

Table (13)
Dependency Ratios in Belarus; 1989 - 2003
(in percent)

Indicator	1989	2000	2003
Young-age dependency ratio	34.6	26.2	23.5
Old-age dependency ratio	15.6	19.6	21.9
Total dependency ratio	50.2	45.8	45.4

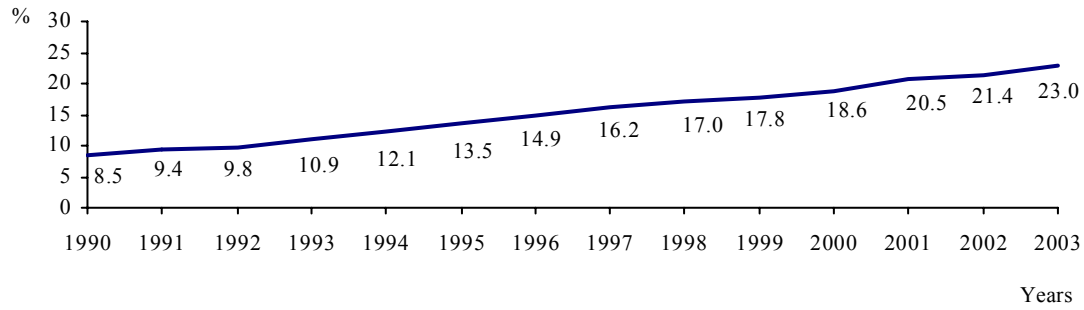
Source: For 1989 - Minstat (2001). Population of the Republic of Belarus. Statistical Book; for 2000 and 2003- calculated from IEHS data.

Note: Population data for 1989 are taken from the 1989 Census.

The decline in fertility level has also been accompanied by quite dramatic shifts in associated behaviour, such as marriage and divorce patterns. Being affected by both, economic constraints and modifying lifestyles and attitudes, the institution of the family in Belarus has come under great stress. The crude marriage rate fell from 9.7 per 1000 population in 1990 to 7.1 per thousand in 2003. According to the last two population censuses, the proportion of married females and males decreased from 60.7% to 56.1% and 72.1% to 65.7%, respectively. The most notable decline was observed among young population aged 20-29 years (60.7% versus 72.5% for females and 46.3% versus 59% for males). Furthermore, families are no longer stable: the crude divorce rate grew from 3.4 per 1000 population in 1990 to 3.8 in 2003. (Minstat, 2004)

Another evidence of the formation of new fertility behaviour in Belarus is the growing number of children born out of wedlock. From 1990, extra-marital fertility rose by 2.7 times and reached 23% of all children born in 2003 (Figure 5) *(Minstat, 2004)*. The dramatic increase of births in unregistered marriages might be explained by several reasons, such as the increase in the number of men and women who decided to dissolve or postpone marriage, growth of cohabiting couples and the inefficiency or non-practicing of contraceptive behaviour, particularly among teenagers and the conception preceding the marriage.

Figure (5)
Share of Live Births to Females in Unregistered Married in Belarus, 1990-2003



Source: Minstat (2004). Statistical Year Book of the Republic of Belarus.

Strong decline of fertility during the last decade, accompanied by a rapid increase in non-marital childbearing, seemingly indicates a uniform adjustment of population to the ongoing process of economic and social changes in Belarus.

Changes in fertility and associated behaviour have been reflected in a decline in the average size of household and a growing variety of household types. The share of populous households has decreased and small-size households now are predominant in Belarus. Three-quarters of the households in 2003 consisted of less than four persons. The average household size decreased by 10.3% from its level in 1995 and in 2003 it was just 2.6 persons (Table 14).

Table (14)
Average Household Size and Percentage Distribution of Households in Belarus by Number of Persons, 1995-2003

	1995	1997	2000	2003
Average size of household (persons)	2.9	2.8	2.7	2.6
Percentage of households comprising:				
1 person	18.6	20.7	20.6	23.6
2 persons	24.7	26.8	27.6	28.6
3 persons	21.8	22.0	25.0	23.1
4 persons	24.3	21.5	19.2	18.8
5 and more persons	10.6	9.0	7.6	5.9
Total	100	100	100	100

Source: For 1995 and 1997 – Minstat (2001). Socio-Economic Characteristics of the Households in the Republic of Belarus. Statistical book; for 2000 and 2003 – Calculated from IEHS data.

The most negative tendency, which occurred recently in Belarus, is the increase of the share of households without children. In 2003, less than half (39.2%) of the total number of households had the children decreased by 8 percentage points from 1995 (Table 15).

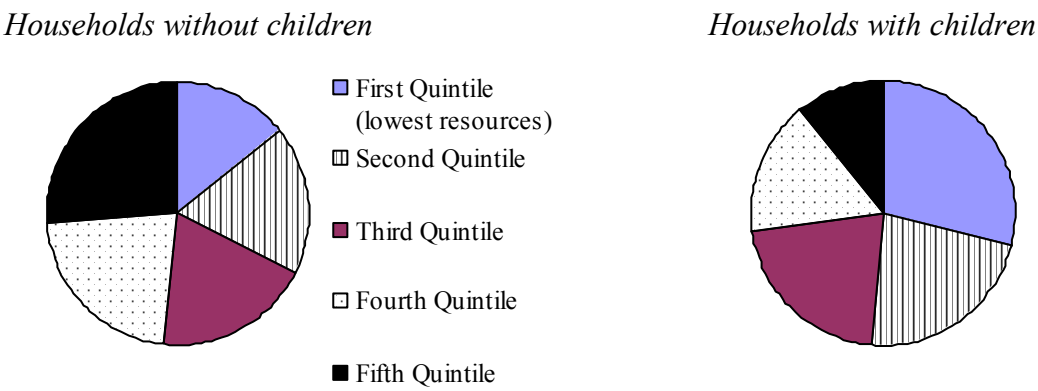
Table (15)
Percentage Distribution of Households in Belarus by Composition, 1995-2003

Percentage	1995	1997	2000	2003
Single-person households	18.6	20.7	20.6	23.6
Households without children, excluding the single households	34.2	33.5	35.5	37.2
Households with children under 18 years old	47.2	45.8	43.9	39.2
Total	100	100	100	100

Source: For 1995 and 1997 – Minstat (2001).Socio-Economic Characteristics of the Households in the Republic of Belarus. Statistical book; for 2000 and 2003 – Calculated from IEHS data.

Nowadays, having a child is a serious and very complex life decision based on the choice between the emotional satisfaction, on the one hand, and a long-term investment of money and time in order to give a child economic, social and emotional support, on the other hand. Insufficient level of income, poverty and other circumstances contribute to the incapacity of households to care of children. In 2003, most of the households with children were in the group of households with the lowest level of disposable resources, and the situation concerning the households without children was notably different (Figure 6).

Figure (6)
Percentage Distribution of the Households in Belarus by Presence of Children and Level of Disposable Resources Ranked by Quintiles, 2003



Source: From IEHS data

REGRESSION ANALYSIS

The study of interrelations between socio-economic characteristics and demographic and household characteristics has attracted the attention of many researchers. The available evidence points out to the fact that changes in the household composition are

heavily associated with the reproductive behaviour of the population. There is no doubt that the fertility level affects the size of the household and the number of children in it. At the same time, fertility depends on a number of factors, some of which are economic by nature and related to the household well-being.

In order to assess the net effect of several variables upon the presence of children in a household, the Stepwise regression analysis is applied. The variables used in the analysis and summary statistics of the model are represented in appendices (3-6). Six of the seven candidate predictors are included in the final model, where the sex of the head of household is excluded due to its statistical insignificance. The multiple regression model with the six explanatory variables is statistically significant at the 1% level having $F_{6/4656} = 886.140$.

The coefficient of multiple determination (R^2) for the six independent variables in the model is estimated at 0.533, i.e. the model explains more than half (53.3%) of the observed variation in the number of children in the households, from which 49.3% is accounted for by the first three variables.

Age of the head of household is the first variable to be selected by the model. The proportion of explained variation in the number of children in the household is 33.5%. There is an indirect relationship between the age of the head and the number of children in a household, which may be because within the study, households, not families, are considered and the number of children per household is not a direct measure of fertility, as for example, the children ever born. Most of the households consist of elderly people, whose children already left the family and so on.

The extent of association measured by zero-order correlation coefficient indicates that the age factor is strongly and negatively associated with the dependent variable (-0.579). Controlling for the influence of other predictors leads to a partial correlation coefficient of (-0.274). The unstandardized regression coefficient shows that as the head of household is older by one year, the number of children decreases by 0.017.

The index of living standards of households is the second important variable in the model, raising the proportion of the explained variation by 10.5%. A higher level of index is associated with a higher number of children, demonstrating a positive and relatively strong effect on the dependent variable (zero-order coefficient is 0.566). The increase in the index value by one unit leads to the growing number of children by 0.786. When controlled for the effect for other related independent variables, it has the highest among predictors value of partial correlation of (0.399).

The place of household location occupies the third place in the line of importance. Households in urban areas have a smaller number of children by about 0.4, compared with households located in rural areas. The proportion of additional variation explained by this factor is 5.2%.

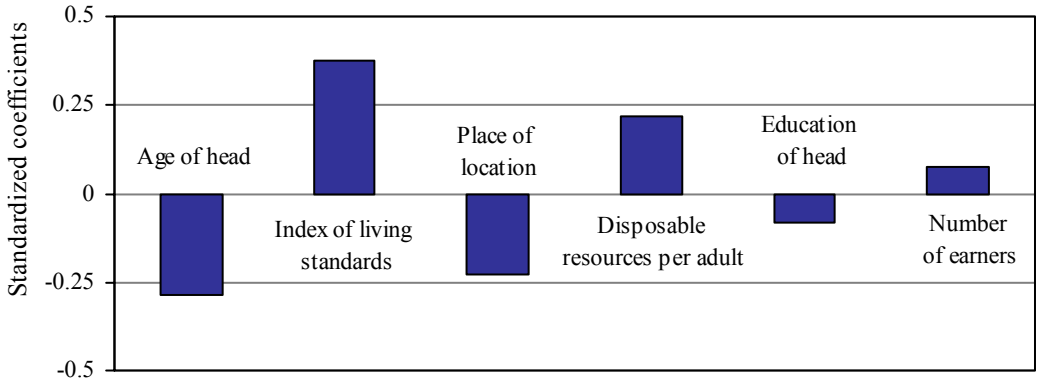
The level of disposable resources calculated per adult (using the log transformation) is the next significant factor included in the model. Its association with the number of children in a household is positive and significant, having a zero-order coefficient of (0.479). Controlling for the influence of other related predictors on the number of children in a household leads to a partial correlation coefficient of 0.265. The unstandardized regression coefficient indicates that increasing the disposable resources per one unit has the growing effect of about one child (b=0.84).

The next place belongs to the educational level of the household head. Households headed by persons with high education have about 0.171 child less than households headed by persons with a lower level of education.

The 'presence and number' of earners in the household occupies the last place of importance. As expected, a bigger number of people, being a source of household support is associated with a larger number of children. The increase in the number of earners per one increases the number of children by about 0.1.

Graphically, the effect of the variables entered to the model on the number of children in the household can be represented in the following figure.

Figure (7)
Effect of Significant Variables on the Number of Children in a Household



Source: Calculated from IEHS data, 2003

In general, from what has been discussed so far, the above results suggest that socio-demographic factors (age of household head, place of household location and educational level of household head) have a negative effect on the number of children in a household, while economic factors, which could be also considered as important determinants, positively affect the dependent variable.

CONCLUSION

Fundamental political, social, and economic processes accompanying the period of the socio-economic transformation in Belarus have produced significant changes to all spheres of life and subsequently affected the welfare and social status of the households.

Analysis of income distribution indicates that the level of per capita resources among the wealthiest households is about four times as high as the resources of poor households. The study of income variation across quintiles, based on applying the multiplication model, reveals that the levels of labour participation and labour income, as well as the presence of dependants in a household, are the main factors differentiating the poor and the rich. At the same time, the presence of non-labour sources of income among the poor households reduces the difference in the level of resources.

According to IEHS results, during the second half of the 1990's, the level of poverty significantly grew, reaching its highest value in 2000 (42% of the population and 36% of the households had the level of income below the poverty line). Despite the marked decline in the level of poverty in Belarus at the beginning of new century, it still remains

one of the major problems of socio-economic development. In 2003, about one-fourth of the population and households were recognized as poor.

Nowadays, the number of children in a household is among the most important determinants of poverty. The more children a household has, the higher is its relative risk of being poor. In 2003, approximately two-thirds of the households with more than two children were recognized as poor.

The presented descriptive analysis suggests that economic instability and uncertainty, the poor financial state of the households, the growing social stratification, the shortage of housing and differences in living conditions are not conducive to reproduction. Households facing new macroeconomic and social environments adapt by changing their demographic behaviour. Increasing convergence in the evolution of the demographic behaviour is confirmed by the various indicators of fertility, marriages and divorces, household size and composition. Total fertility rate in 2003 was 1.206 children per woman, i.e. decreased by 37% of its level in 1990. Crude marriage rate decreased during 1990-2003 by 27%, while crude divorce rate grew by 12%. The number of children born out of wedlock rose by 2.7 times and in 2003 reached 23% of the total number of births.

The pronounced fertility trends and associated behaviour, which doubled with adverse socio-economic conditions in Belarus, have had a negative effect on demographic formation of the households. Small-size households now are predominant: three quarters of the households in 2003 consisted of one to three persons. The average household size decreased by 10.3% from its level in 1995 and in 2003 it was just 2.6 persons. About 60% of the household had no children.

The applied regression analysis mainly aimed at establishing the relationship between socio-economic and demographic household characteristics on the empirical level, and its results at least suggest the existence of such relationship. Application of the statistical analysis would not be possible without considering several assumptions and simplifications; therefore its result should be interpreted very cautiously. Nonetheless, the above mentioned analysis brings about essential inferences. The socio-demographic and economic factors included in the model explain more than half (53%) of the variation of the dependant variable (number of children in a household). It is not surprising that one third (33.5%) of this variation is explained by 'age of household head'. The more important is the relatively strong effect of 'index of living standards' on the dependent variable. Being the reflection of the household economic potential and explaining 10% of variation, 'index of living standards' occupies the first place in line of importance among the selected economic variables. Almost half of the unexplained variation (47%) suggests that the undeniable impact of social and cultural changes on household composition is at least equally important to the impact of the factors considered in the analysis.

Appendix (1)

Scoring Factors and Summary Statistics for Variables Entering the Computation of the First Principal Component of Household Living Standards Index

Asset	Scoring factors	Mean	Standard deviation
Presence of central heating	0.240	0.79	0.41
Presence of bath or shower	0.258	0.70	0.46
Presence of hot water	0.253	0.66	0.47
Presence of telephone	0.170	0.75	0.43
Own TV	0.087	0.96	0.19
Own refrigerator	0.110	0.95	0.22
Own washing machine	0.107	0.71	0.45
Own car	0.082	0.24	0.43
Own land-plot	-0.153	0.61	0.49
Share of food expenditure in custom expenditures	0.102	0.50	0.50

Source: Calculated from IEHS data, 2003.

Note: The housing conditions of the household (presence of central heating, bath or shower, hot-water and telephone), the ownership of durable goods (TV, refrigerator, washing machine and car), the ownership of land-plots and the percentage of food expenditures in total custom expenditures are used for the computation of this index. The last measure is included in the form of comparison with its median level.

Each variable besides share of expenditures on food takes the value 1 if true, 0 otherwise. The last measure includes in the form of comparison with its median level (1-is less of equal to median level; 0 is above the median level). Scoring factor is the "weight" assigned to each variable (normalized by its mean and standard deviation) in the linear combination of the variables that constitute the first principal component. The proportion of the covariance explained by the first principal component is 34.6%.

Appendix (2)

Mean Values for the Ownership of Each Asset

Asset	Quintiles				
	First	Second	Third	Fourth	Fifth
Presence of central heating	0.69	0.74	0.78	0.84	0.91
Presence of bath or shower	0.57	0.61	0.68	0.76	0.86
Presence of hot water	0.53	0.57	0.65	0.74	0.81
Presence of telephone	0.55	0.70	0.78	0.85	0.88
Own TV	0.92	0.96	0.97	0.99	0.99
Own refrigerator	0.88	0.94	0.97	0.98	0.97
Own washing machine	0.59	0.66	0.73	0.78	0.78
Own car	0.12	0.19	0.24	0.29	0.37
Own land-plot	0.65	0.65	0.64	0.58	0.54
Share of food expenditure in custom expenditures	0.58	0.57	0.51	0.48	0.36
Index of living standards	0.735	0.816	0.902	0.994	1.095

Source: Calculated from IEHS data, 2003

Appendix (3)

Description and Categories of the Variables Entered to the Regression Model

Name of variable	Description and Categories
Dependent variable	
NCH (Number of children)	Number of children in a household
Independent variables	
AH (Age of head)	In single years
SH (Sex of head)	0=Female 1=Male
NE (Number of earners)	Number of earners in a household
LDR (Per adult disposable resources)	Log of per adult disposable resources for each household
ILS (Index of living standards)	Index value for each household
PL (Place of household location)	0=Rural 1=Urban
EDH (Education level of head of household)	0=Below high 1=High

Note: Disposable resources, calculated per adult, have a large standard deviation (96.1) compared to its mean (168.6) and, moreover, the distribution of resources is positively skewed (Skewness coefficient = 4.081), so each value is log transformed and stored as a variable named LDR (Log of disposable resources).

Appendix (4)

Correlation Matrix of the Number of Children in Households and Different Variables Considered in the Analysis

	NCH	AH	NE	EDH	LDR	SH	ILS	PL
NCH	1.000							
AH	-0.579**	1.000						
NE	0.479**	-0.684**	1.000					
EDH	-0.049**	-0.046**	0.062**	1.000				
LDR	0.479**	-0.412**	0.341**	0.167**	1.000			
SH	0.136**	-0.139**	0.241**	-0.010	0.059**	1.000		
ILS	0.566**	-0.488**	0.444**	-0.003	0.411**	0.104**	1.000	
PL	-0.053**	-0.110**	0.117**	0.098**	0.096**	-0.055**	0.319**	1.000

Source: Calculated from IEHS data, 2003

*Note: **- Correlation is significant at the level 0.01*

Appendix (5)

Summary of the Results of Regression Model on Number of Children in Households

Step	Variables	Correlation		R^2	R^2 change	Unstandardized coefficient		Standardized coefficient β	Significance
		Zero-order	Partial			b	St.error		
1	Age of head	-0.579	-0.274	0.335	0.335	-0.017	0.001	-0.283	0.000
2	Index of living standards	0.566	0.399	0.411	0.105	0.786	0.026	0.377	0.000
3	Place of location	-0.053	-0.297	0.493	0.052	-0.406	0.019	-0.226	0.000
4	Log of resources	0.479	0.265	0.524	0.032	0.840	0.045	0.217	0.000
5	Education of head	-0.049	-0.113	0.530	0.006	-0.171	0.022	-0.080	0.000
6	Number of earners	0.479	0.078	0.533	0.003	0.077	0.014	0.075	0.000
	Constant					-3.316	0.248		

Source: Calculated from IEHS data, 2003

Appendix (6)

ANOVA Results of Regression Model of NCH

Source of variation	Degree of freedom	Sum of squares	Mean square	F	Significance
Regression	6	1825.497	304.249	886.140	0.000
Residuals	4656	1598.603	0.343		
Total	4662	3424.100			

Source: Calculated from IEHS data, 2003

Note: NCH – Number of children in a household

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