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World Population Forecast up to 2050 and Labor Saving Technologies

Key words: population growth, forecast, population aging, labor-saving technologies, robotics

Abstract. The author presents Population forecast for the major countries of the world based on his own methodology and sampling technic up to the year 2050. This forecast is compared with the available UN population forecast. Country groups are defined on the basis of principal population growth problems (resource shortage and population aging). As population aging is becoming a global phenomenon, labor-saving technologies in various spheres of economy are examined and discussed as a viable tool for labor replacement. Though it may preserve a slow-down in the more advanced economies, labor-saving technologies will become a limitation for the export oriented economic model in the less developed economies.

Population size is a very important indicator of the global development. Population indices measuring at the same time productive force and consumer rates can clearly outline the key features of social and economic development. The paper presents author's population forecast for the major states and regions of the world up to 2050. The forecast is estimated by the operational description of demographic transition. Comparative analysis with the UN population forecast data has been conducted. Both forecasts are used to find out the principal development features and the limitations resulting from population dynamics. As population aging all over the world is forecasted to rapidly accelerate in the coming decades, technologies that enable to economize human labor are analyzed in the paper.

Population Forecast Based on Operational Description of Demographic Transition

To estimate future population size, the UN demographic data has been used. The data is derived from population censuses that were conducted around 2010 [See Demographic Yearbook, 2011; World Population Prospects, 2012]. The forecast registers important features of the global demographic transition: a lower number of nations in the before-transition group and a higher number in the post-transition one.[1] Nevertheless, currently about one third of the nations and regions studied in the forecast (see table 1 in Appendix) fall in various stages of the demographic transition.

Developed nations in post-transition phase experience no considerable changes in the current fertility and mortality rates. These countries approach zero popula-

[1] Forecast methodology and estimates according to different scenarios are presented in [Akimov, 2014].

tion growth, encounter stabilization of population size and face subsequent population decrease as a combination of low fertility and population aging factors. This pattern of demographic development in economically developed nations remains stable, for instance this is observed in Europe. At the same time, post-Soviet nations (Russia, Ukraine, Belorussia, Moldova, Armenia and Georgia) also follow the same pattern of development. Above listed nation have passed demographic transition before the breakdown of the USSR, and thus the subsequent worsening of living conditions in the last two decades has coupled with this long-term trend of demographic development.

Demographic pattern in the Asian developing and transitory economics demonstrates high rate of demographic transition, and this is a result of social and economic development coupled with birth control policy. For instance, population growth in China in 1975–95 was described by demographic patterns (liner models of number of population growth, that are pairs of crude birth and death rates at a particular stage of social and economic phase, measured by the number of people employed outside agricultural sector) that are specific for the post-transition countries with still rather high birth level. These patterns were specific for the USA and Canada in early 1960. After 1995 figures of Chinese population dynamics get similar to those of Sweden from 1920 to nearly 1970s; and in 2005–2010 they correspond to those of Western Europe in the early 1970s. These similarities show that demographic dynamics in China gets in agreement with the trends in the most developed countries of the world. Keeping in mind the share of China in the global population, one can clearly see the importance of Chines demographic progress.

As for India in the same period, its demographic patterns have been based on birth control measures taken during demographic transition. Only since 2005 the pattern that is characteristic of the post-transition countries became applicable to India.

The last decades have demonstrated significant progress in the demographic transition. In 1975–80 demographic patterns that are characteristic to demographic transition in birth had been observed in the Central Asian republics, in all Asian states that are included in this research (with the exception of Japan, Israel, and Cyprus), in all African states, in Latin America (with the exception of Argentina, Uruguay, and Chile), and also in Oceania. In 2005–2010 these patterns are identified in Pakistan, Afghanistan, Nepal, and Bhutan that were lacking behind in the demographic transition earlier.

Demographic transition is also on in African countries but social and economic level of the region is lower than that in the other regions and Africa will inevitably see a considerable increase of its population size. (See Table 1 in Appendix).

UN Demographic Forecast

In 2012, Population Division of the UN Economic and Social Department issued its 23-d long-term economic forecast [World Population Prospects, 2012]. Similar to the previous editions, four scenarios extended up to year 2100 are examined in the

forecast. The constant fertility scenario foresees world population growth reaching 30 billion people by 2100, which means that global birth decline is inevitable.

The forecast is based on the medium scenario, while high and low scenarios outline the borders of variation from the medium under appropriate assumptions about fertility changes. Under the medium scenario, global population will rise by one billion people in the next 12 years from 7.2 billion people in mid-2013 to 8.1 billion in 2025. This rate of population increase by one billion has been common since the world population reached three billion people. So, the forecast foresees no dramatic changes in population growth rates in the nearest future. After 2025 growth rates will slow down and by 2050 the world population is expected to reach 9.6 billion people.

The medium scenario foresees further birth decrease in developing countries and a slight rise in developed nations. Fertility is the principal component in the demographic trend that will characterize population change in the 21st century. Relatively small changes in fertility will lead in the long run to big changes in number, structure, and geographical distribution of population. The high scenario is based on an assumption that total fertility rate will increase by 0.5 child per woman as compared to the medium scenario. It will result to population growth to 10.9 billion by 2050. The low scenario assumes that fertility will drop down to 0.5 child from the medium scenario assumption and this brings the world population to 8.3 billion people in 2050 that is 1.3 billion less than foreseen by the medium scenario. See Table 1.

Table 1

Population of the Main Groups of Countries According to the Medium Scenario, *Bln. people* (lines 2–5), and *%* (lines 7–10)

	2013	**2050**
More Developed counties	1.25	1.3
Less Developed counties without Least Developed	5.0	6.4
Least Developed counties	0.898	1.8
World total	7.148	9.5
	2013	2050
More Developed counties	17.5	13.7
Less Developed counties without Least Developed	69.9	67.4
Least Developed counties	12.6	18.9
World total	100.0	100.0

Source: Compiled from [World Population Prospects, 2012].

Table 2 demonstrates high unevenness of population dynamics in different groups of countries. In the more developed countries population number is almost stable while the group's share in the world population decreases. In the less developed countries (without the least developed ones) by the end of the 21st century population will increase by the number that is surpasses the present population

of more developed countries, but the share of less developed countries (without the least developed) in the world population will also decline. The most dramatic changes will occur in the group of less developed countries. Population of this group is to double by 2050 as compared to 2013.

The authors of the 2012 UN study stress that the latest forecast revision demonstrates higher world population than the previous one. It is the result of a new fertility study in the less developed states that show no evidence of rapid birth decrease, which had been anticipated earlier. Sub-Saharan Africa is the region where fertility remains permanently high. In 2005–2010 total fertility rate was rising in 15 countries of this region. The second reason for higher population size forecast is a little correction in the fertility trend observed in the highly populated countries. Besides, live expectancy at birth estimates have been increased for several less developed countries. It means that the death rate will be lower and thus the population size will be bigger.

Detailed birth and death analysis regularly performed by UN in different countries shows more moderate rates in the decline of population growth than had been expected in the late 1990s. UN revises its population forecast once in two years. Those revisions show rather stable trend of population size growth in the forecasts. See Table 2.

Table 2

UN Population Size Forecasts by the Medium Scenario, *Bln. People*

Revision year	**2000**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**
Population in 2050	9,3	8,9	9,1	9,2	9,1	9,3	9,6

Source: [World Population Prospects, 2000 ...]

Another global trend is population ageing that represents the rise of older people share in the total population resulting from higher life expectancy and lower fertility. See Table 3.

Table 3

Population Aging in the World, UN Population Forecast

	2013	**2050**
60 and older, world total, bln.	0,841	2
60 and older, share in the population, %		
More developed countries	23	32
Less developed countries	9	19
60 and older , share in the world population of the age group. The world total = 100%		
More developed countries	34	21
Less developed countries	66	79

Source: Compiled from [World Population Prospects, 2012].

The completion of demographic transition in the majority of developing countries and transitory economies will result in the rapid rise of older people all over the world. Even at present, in less developed countries the number of older population is twice as high as in the more developed countries. The aging affects the economy and social live through different channels ranging from financial budgets to changes in the economic models caused by changes in the number and structure of labor force and consumers.

Operational description of demographic transition that lies in the basis of the first forecast presented in this article has been designed for analysis of not only demographic variables but also for the study of other spheres of human societies that are connected with the demographic processes. The most important area here is natural resources that provide means for human survival and for social and economic development [Akimov, 2008; Akimov, Yakovlev, 2012].

Forecast by operational description of demographic transition is based on data about social and economic development of a country or a region. Future population size is estimated on the basis of social and economic trends that change population growth patterns.

The comparison between UN and operational description forecasts shows that both forecasts foresee the same population trends. Nevertheless, all the three scenarios of operational description forecast foresee higher population sizes than those envisaged by UN similar scenarios. This means that social and economic trends indicate the higher population growth potential than shown by demographic analysis used by UN population division. Estimates of world totals by 2050 are similar according to both forecasts but there are discrepancies in estimates for particular countries and regions.

Social and Economic Consequences of Population Changes

The last decades have produces two groups of social and economic problems connected with population changes. The first represents natural resources limitations to the population growth and the second acccounts for the negative impact of population aging on society.

Forecast of population changes up to 2050 enables to group the contries by the types of promlems they face in their demographic development. Demogaphic transition that lasted for many decades is now over in all the European countries, including all post Soviet states in Europe and Transcaucasus, North America, and the majority of Latin American states, Australia and New Zealand, Easten Asia and many South-East Asian states, Turkey, and Iran.

There are several subgroups in this group. The first one includes the countries that have considerable natural resources or the economic potential for importing requisite natural resources but experience problems with aging population. Members of this subgroup include countries of Western, Northern, Central, and South-

ern Earope, and also the majority of East European countries, Japan, Republic of Korea, Turkey, and Israel.

The second subgroup comprises the countries that account for considerable export of raw materials, fuel, and food. Many of them are exporters of manufactured goods. This subgroup also suffers from population aging. It includes the USA, Canada, Russia, Australia, New Zeland, Argentina, Uruguy, and Chile.

China is a country with a combination of problems. It is a rapidly ageing country with considerable natural resources problems. To be formal, one should classify China in the first group as it possesses the economic might for buying all necessary resources abroad. Still, China's size and the scale of its national problems make it necessary to allocate it to a separate subgroup. The majority of countries in the first group are postindustrial econimies but China is still developing its industrial society. Its demand for natural resources is great not only because of the scale of Chinese economy but also because of the present character of its economic development.

Another subgroup includes the countries at the late phases of demographic transition and post-transition countries with still young population and abundant natural resource. This group is formed by Latin American countries.

Specific subgroup is formed by the Gulf oil exporting countries. Their natural resources nourish the economic prosperity and these societies still cultivate traditional values that slow down demographic transition process.

There are other countries that need natural resources for their social and economic development and are still in the demographic transition. The first subgroup here is represented by South Asia, including India, and by South East Asia. Egypt is also in this subgroup.

Another subgroup is represented by the countries that are in demographic transition but they possess natural resources for sustaining traditional society values. Many African countries find themselves in this group. Considerable parts of Africa are still largely underpopulated and traditional agricalture is ecologically sustainable there.

Resource issues are discusses in the articles devoted to energy [Borisov, 2013] and agriculture [Deryugina, 2014]. Below, we examine technological decisions that neutralize negative consequences of population aging for both more developed countries and for transitory economies, especially for China.

Technologies versus Population Aging

In the coming decades labor market in majority of the countries will face commercial development of the new labor saving technologies that are going to considerably increase labor productivity. IT technologies, electronics, and robots are the most well-known components of these technologies. Nevertheless, there is another stream in technological development that visually is in contrast to small size electronics. It is represented by production of large scale machine complexes which can handle great amount of bulk cargos including ore, coal, and so on, and also can transport them involving minimum use of human labor.

Below, we examine principal trends in production and development of those two types of machines and equipment and their potential impact on the world market in three sectors of economy: primary (agriculture, forestry, fishing, and mining), secondary (manufacturing, and construction), and tertiary (transportation, trade, finance, services).

Primary sector

In arable agriculture a complex of machines for grain farming has been in use for more than a century. Tractors and harvesters can perform almost all operations required in grain farming. In arable farming only fruit and vegetable harvesting is still relatively low mechanized. At present much of manual labor and low mechanization in many countries are not results of technological limitations but are derived from social and economic underdevelopment, lack of financial resources for agriculture, and from overpopulation in rural areas.

In animal breeding the most industrialized sector is represented by broiler factories and farms for poultry and pigs breeding. Meat cattle breeding in global economy is actively developing in several regions, especially in North and South Americas and in Australia, where cattle is bred in the vast pastures that are controlled by farmers who move riding houses, driving jeeps, and flying by helicopters. Technologies are similar in sheep breeding. Dairying required more labor employment for milking but today there are robotic milking systems that almost exclude human labor.

In fishery, industrial technologies are based on combination of trawlers and fish processing ships that have been developing since 1950s. These systems insure huge volumes of fish catch, storage, and transportation and they are highly mechanized as well.

In forestry gasoline tree fellers and fork-lift trucks produced technological revolution that has spread to all countries with vast forests, including South East Asia and South America.

There are two basic trends in mining industry. The first one is development of oil and gas industry that is low labor intensive. The second one is development of highly productive big mining equipment which makes open-cast mining economical and excavation replaces mines that are much more labor intensive. Modern technologies provide all kinds of bulk cargos handling from extraction to loading and unloading in sea ports and railroad stations.

Secondary sector

At present two trends are competing in manufacturing. The first is shifting production from more developed economies to less developed countries with cheap labor. Very often it is more profitable than investing in expensive robots. The most evident examples here are clothing and footwear industries. Currently, cheap labor wins competition with robots and automated production lines. Clothing and footwear industries have left Europe and Northern America for Asia and Latin America where labor is cheaper.

There is a competition between labor and automated lines, machines, and robots. Robots win in welding. Welding robots are diverse and are widely spread in automobile industry and in ship-building. Welding robots in car industry are used even in India where labor is cheap and abundant. In an automobile industry welding robots are included into production technology chain and there are no other technologies to produce modern cars and trucks. In ship-building more complicated welding robots are necessary as robots should move along the hull but this technology greatly accelerates production and insures high quality of welding.

The toughest competition between cheap manual labor and robots is seen in production of electronics. Modern smartphones and iPads can be produced both by labor as well as by machine lines and robots. Finnish Nokia use robots that can install about 80,000 elements per hour, while there are only about 360 parts in a smartphone that should be installed.

When Japan had been fighting for leadership in electronics industry in 1960s — 1980s manual labor was indispensable in many operations. At that time it was national cheap labor that had won leadership place for this country. Now, there is a viable alternative to manual labor. Still, iPads on American order is produced by Chinese Foxconn. This company gives jobs to hundreds of thousands of people and 325 pairs of hands are necessary to produce one iPad. Chinese company acts exactly like Japanese companies did several decades ago winning world leadership with the help of cheap labor.

The most dynamic part of advanced labor saving technologies derives form industrial robots. In 1961 the first industrial robot was employed by General Motors in car production. Since 1967 industrial robots have been used in Europe, and Sweden was pioneering in his field. In 1969 Japan started to use robots and in 1971 the national robotics association was found there to be the first in the world. This association played a very important role in building Japanize leadership in this field.

In 1973, 3.000 industrial robots were functioning in the world, 66.000 in 1983, 800.000 in 2003, and 1.100.000 in 2011 [History of Industrial Robots].

In 2013179.000 new industrial robots were installed in the world, 12 percent of the 2012 level [Global robotics industry, 2013]. According to the data for 2009–2013, which is collected and analyzed by the International Federation of Robotics, Asia is leading in installing industrial robots. See Table 4.

Table 4

Installation of industrial robots in 2013

Region	**Installed industrial robots,** *1.000*	**Rise to 2012, %**
Asia	100	18
Europe	43	5
America	30	8

Source: compiled from [Global robotics industry, 2013].

Even Africa has joined the process of robotization. In 2013, 700 industrial robots were sold there, 87 percent higher than in 2012. The rise of the number of robots is not smooth. In 2012, there was a decline as compared to 2011 in Asia and Europe, but no decrease was observed in America [Global robotics industry, 2013].

Among the national robots markets China is a leader in both the number and rate of increase. China accounts for 20 percent of all industrial robots installed in 2013. Japan, the USA, Republic of Korea, and Germany together account for 50 percent [Global robotics industry, 2013], thus these five economies account for 70 percent of robot increase in the world.

In 2013, 37.000 industrial robots were sold in China. Out of this total, 9.000 robots were made in China. It is three times bigger than just a year before. Other robots were imported. Annul increase of import rate was 20 percent. From 2008 to 2013 annual increase of robot population in China was around 36 percent [Global robotics industry, 2013].

Japan was the second in robot population increase in 2013 but this country is still the world leader in the size of its robot population. There are more than 300.000 industrial robots installed in Japan. Besides, this country is a world leader in robot production. More than a half of robots sold in the world in 2013 are produced by Japanize companies. In 2013 industrial robot sales in Japan decreased by 9 percent to 26.000 units because of lower investments to automobile and electronics industries but robot exports from Japan was growing [Global robotics industry, 2013].

The USA is the third largest national robot market in the world. In 2013, this market increased by 24.000 units or 6 percent compared to 2012. In 2008–2013 the US annual growth rate was 12 percent, while China accounted for 36 percent. The rise of the US market is part of a general trend for the increase of automation in manufacturing that will make American industry more competitive and bring back to the country the work places that were lost to other countries in the previous years.

In Republic of Korea industrial robot sales increased in 2013 by 10 percent to the amount of 21.000 units in accordance with investment rise in automobile industry. At the same time, electronics industry which is the main robot consumer in Republic of Korea decreased purchase of robots. On the whole, in 2013 robot installation figures were lower in Korea than in 2010 and 2011.

Robot sales in Germany were up by 4 percent in 2013 and reached 18.000 units but it is lower than the records set in 2011. The leader of the rise is automobile industry that is typical for this country. In 2008–2013 the annual increase of robot installation in Germany was 4 percent [Global robotics industry, 2013].

In 2013 considerable increase of robot installation took place in Taiwan, India, and Indonesia. In Europe Italy and Spain are important markets.

The most robot-hungry industry is automobile production. In 2010–2013 the annual rate of robot installation there was 22 percent. It was located mainly in China, Germany, and the USA but in 2013 the rate of growth slowed down to only 5 per-

cent. In parallel to automobile industry, machine-building and metal-working also were increasing their robot population by 22 percent annually in 2010–2013, but in 2013 the rise became more moderate and was equal to 17 percent. Among intensive robot buyers in 2013 were electrical, electronics, food, and pharmaceutical industries [Global robotics industry, 2013].

As it is stressed in the report of the International Federation of Robotics, the main reasons for robotics development in industry are trends for more energy efficiency and new materials use. These trends require new technologies. Global competition also pushes national producers to increase output and improve quality of goods. Growing markets need additional production capacities, shorter life cycle of goods and this demands more flexible automation, replacement of personnel in dangerous, dirty, and monotonous work places by machines. New effective systems of robot and operator interaction have been developed to increase industrial productivity. Safety is a key element here and the international standards of safety are being worked out to facilitate robot diffusion [Global robotics industry, 2013].

There is still much manual labor in construction but new technologies are developing here as well. Monolithic concrete buildings need less construction workers than any other construction technology. In cottage building a set of all required elements can be produced and packed in a factory and at construction site the workers have just to assembly the pre-fabricated parts that saves time considerably. Tunneling machines are currently wide spread in mining, road and tunnel construction.

Tertiary sector

Cargo containers have radically changed transportation technologies and made traditional loaders antiquated. Another innovative trend is represented by the above mentioned mechanized bulk cargo handling.

Many manual work places are being replaced in trade. New trade formats including "cash and carry" and the Internet trades are much less labor intensive than traditional retail trade. In banking and finance, banking machines and the Internet banking are replacing banking officers and robot traders and vending machines replace people even in exchange services and piece-meal trade.

In medicine and health sector robot application is expanding in two directions. The first one is related to medical care and the second one covers the field of diagnostics. In the USA and also in Japan and Republic of Korea robots are used for patient care in hospitals. In 2013, in Republic of Korea nurse-robot KIRO-M5 was presented to the public. It is a compact transportation robot one meter high weighting 80 kilograms. It can carry medicines and other useful loads. It can sterilize air in various premises, inform nurses when it's time to take the prescribed medication or change disposable napkins for bed patients. Robot wakes up patients, signals them about food arrival, informs when it is time to do physical exercises. The robot has a function of emergency call for the doctor. At night its camera allows nurses to watch patients without physically visiting

wards. The robot is equipped for carrying those patients who can't walk [Korean engineers…].

There are test models of robots which can make a diagnosis with 95-percent probability analyzing several medical tests of the patients. Contrary to human medical doctors they can never get tired and do remember all medical cases from bid data bases of the patients.

There are new home robots. They are used in households for vacuum cleaning, window glass washing, grass cutting and swimming pool cleaning. Robots have also advanced to the sphere of education. Here, robots are efficient helping limited ability pupils. Anthropomorphic robots can be used in severe cases. This type of robots can also be used in cafés, exhibitions, and hospitals.

Technologies in robotics have become so developed and so cheap at the same time that it is feasible to design and produce robots for making hamburgers. Labor has never been expensive in hamburger making and technology has never been very complicated in hamburger production, so there is no pressing need for robotization there. Still, the new robot is planned to be used in café with round-the-clock and working hours and in peak of demand time.

Social and economic consequences of robotics

Robot advancement is currently reaching a new level. Initially, robots were considered to be only an element of industrial equipment. At present, they already have abilities and capacities that enable them to replace human workforce in many activities. This situation influences trends in social and economic development in many ways and has several consequences.

First, now, population aging in the more developed countries does not mean inevitable economic decline resulting from decrease of labor force. Robots can replace labor in industry and services. High level of human capital and its quality represent a considerable advantage in these countries. It may turn into a basis for economic growth even when the size of population declines. Design and production of robots need top of the level engineers, very skilled labor, strict production discipline, and friendly business environment. All these elements can be maintained if labor is qualified and qualification is related to the quality level of human capital.

Second, as a result of the first statement, labor immigration to more developed economies is no more irreplaceable condition for the economic growth. Japan demonstrates a very interesting experiment. This country has a high share of elder people in its population but a marginal number of labor immigrants. At the same time, with the wide use of robots Japanese industry is developing quite successfully.

In less developed countries the increase of population in working ages is still very high and the local labor market can't accept newcomers. If labor markets of the more developed countries would cease to accept migrants, it will be a shock to less developed countries.

Third, highly productive machinery and equipment based on robotics in more developed countries will open the markets of less developed nations to their export. It will be an additional stress to national economies in Asia, Africa, and Latin America which may fail to build themselves in the emerging new international technological and economic system.

Fourth, population aging in China which has the greatest population in the world and which is the most successful transitory economy will not be a threat to the social and economic development of this country. There had been fears that population aging in China would stop the economic growth and push the country back in its development. A crisis of this kind would have global negative effects.

Fifth, labor-saving technological revolution in the West may make industrial imports from the East and South unnecessary. In this case, less developed nations will face the necessity of building a new economic model orientated on domestic demand with marginal export to the West. When the major part of population is poor this demand can be generated only by the government expenditures, and so Keynesian economic policy and international development assistance will be necessary. Market economic mechanisms may be narrowed and partially replaced by state distribution and redistribution.

Sixth, probability of growing instability and emergence of newly failed states will increase where jobless youth will be easily recruited in terroristic organizations with ideological basis and to criminal groups.

So, demographic growth will bring the problems that differ from those of the previous decades. More developed nations have achieved the very high level of technological and economic development that allows to overcome both natural resources limitations and economic difficulties related to population aging which have for some time disturbed politicians, business, and public. [Kandalintsev, 2014].

At the same time, less developed nations face both resource limitation problems and population aging. The double burden of such magnitude is a new situation for less developed nations and thes developments will impair many spheres of social and economic life in the world.

Appendix 1. Population Forecast

Table 1

Population forecast up to 2050 according the real scenario (simple mean of medium and low scenarios for India, Bangladesh, Pakistan, Nepal, and Bhutan, medium scenario for other states and regions)

	2010	2020	2030	2040	2050
Russia	142390,0	138865,7	135428,6	132076,6	128807,6
Belorussia	9481,0	9017,5	8576,6	8157,3	7758,5
Ukraine	45963,0	43715,9	41578,7	39545,9	37612,5
Moldova	3562,0	3562,0	3562,0	3473,8	3304,0
Transcaucasus	16763,0	18063,5	18520,2	18988,5	19468,6
Kazakhstan	16339,0	18048,4	19448,7	20957,6	22583,5
Uzbekistan	28001,0	31703,7	34589,4	37272,9	40164,7
Turkmenistan	5042,0	5433,2	5854,7	6308,9	6468,4
Tajikistan	7573,0	9007,4	10453,4	11835,8	12913,0
Kyrgyzstan	5193,0	5595,9	5737,4	5882,4	6031,2
Europe	533969,0	540677,3	547469,8	554347,6	540627,0
China	1337700,0	1371522,2	1406199,5	1423865,6	1423865,6
Japan	128070,0	128070,0	128070,0	124900,1	118793,8
North Korea	24346,0	24961,6	25592,7	25592,7	25592,7
South Korea	49410,0	51935,3	53248,4	54594,7	55280,6
Mongolia	2758,0	3046,5	3282,9	3537,6	3812,1
Indonesia	239871,0	261703,8	282007,6	303886,6	319417,7
Philippines	94013,0	109105,9	126621,9	139869,3	150720,8
Vietnam	86933,0	93677,5	100945,3	108777,0	111527,3
Thailand	67312,0	72534,3	78161,7	80137,9	82164,1
Malaysia and Singapore	33327,0	38677,3	42723,8	46038,5	49610,3
Other countries of South East Asia	86994,0	100960,1	111522,7	120175,0	129498,6
India	1182105,0	1355151,6	1497777,3	1586699,7	1652438,7
Bangladesh	148620,0	170376,3	188307,9	199487,6	207752,6
Pakistan	173593,0	209044,2	254823,8	299456,7	337377,8

Afghanistan	24486,0	29848,3	36384,9	42226,2	49005,2
Iran	74340,0	82117,6	88488,5	95353,8	102751,6
Sri Lanka and the Maldives	20973,0	22881,9	24657,2	26570,2	27928,1
Nepal and Bhutan	28770,0	35070,5	43303,2	50976,8	57201,7
Turkey	73142,0	74991,3	76887,4	77853,3	77853,3
Israel	7624,0	8848,0	9773,7	10531,9	11349,0
Arab countries in Asia	134984,0	172790,9	210631,2	244446,1	283689,7
Cyprus	804,0	866,4	933,6	1006,0	1031,5
North Africa	207013,0	240247,0	278816,5	307986,8	331881,4
Ethiopia	82950,0	103621,5	132644,2	169795,7	212103,1
Eastern Africa less Ethiopia	241094,0	324010,1	424975,5	530865,0	631415,5
The Congo Democratic Republic	65966	88653	116278	145251	172762
Central Africa less The Congo Democratic republic	60723	81607	107036	133706	159031
South Africa	50133	54696	58940	63512	66758
Southern Africa Kess South Africa	7647	9096	10819	12868	15687
Nigeria	158423	202795	247206	286892	332950
Western Africa less Nigeria	145838	195994	257068	321121	381944
The USA and Canada	343177,0	369801,7	388701,6	398529,5	408605,9
Mexico	113423,0	128421,6	140110,4	150980,6	162694,2
Caribbean	41442,0	44657,2	48121,8	49338,5	50586,0
Central America	42459,0	49275,4	57186,1	63169,0	68069,9
Brazil	193253,0	210842,7	227200,5	244827,4	257340,1
Argentina, Uruguay, Chile	60970,0	65700,2	70797,5	76290,2	78219,1
Other South America	137232,0	155379,0	169521,5	182673,5	196845,8
Australia and New Zealand	26668,0	29458,1	31743,5	34206,3	36860,1
Oceania	9956,0	11554,3	13409,3	14812,2	15961,4
World total	6822818,0	7607680,8	8402139,6	9091656,0	9684116,6

Source: calculations and estimates of the author performed by operational description of demographic transition (change of demographic growth patterns that are combinations of crude birth and death rates at various stages of social and economic development).

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