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Introductory remarks

Economic journal „Entrepreneurial Economy“ celebrates 10th anniversary of publishing this year. Seventeen volumes, some of which had several issues, have been published from 2002.

This is the Volume XVIII.

The journal is published by the Foundation „Entrepreneurial Economy“ of the Postgraduate studies „Entrepreneurial Economy“, Faculty for International Economics, Finance and Business, University of Donja Gorica, Montenegro.

Demographic trends have been changing the picture of the world in previous centuries. However, projections say that demographic flows will remain strong challenge for contemporary world in following decades, as well. Changes in population have strong influence on economy of certain areas and global economies overall, but also raise an issue of sustainability of development. That is the reason that papers in this volume deal with very different aspects of demographic and development challenges contemporary world is facing.

All papers are written in English which is broadening the market of potential readers of this economic journal.

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Veselin Vukotic*

Demographic Megachanges

Abstract: *World population is growing rapidly. Is the world prepared for the consequences? Are certain countries prepared for the consequences? Are Montenegro and Serbia, as countries with evidently slow population growth, prepared for new demographic megatrends? If world is becoming more "flat", as Thomas Friedman says, how will new "distribution" of population in the world look like? Is the history of world migrations going to repeat? Have we and how much neglected demographic research in Montenegro and Serbia, despite the fact that Demography courses are organized at some universities, which is encouraging fact? All these issues are discussed in this paper.*

Key words: *demography, population, migration, globalization, state organization, entrepreneurship*

1. Introduction

World population is growing rapidly. Is the world prepared for the consequences of this rapid growth? Are certain states prepared for the consequences?

Stagnation, i.e. slow population growth of Montenegro and Serbia is evident in last decades. Are these countries prepared for the consequences of these local demographic megatrends?

If the world is becoming more *flat (*Thomas Freedman), how will the new "redistribution" of population look like? Will the new *flat* world enable migrations from overpopulated and fast-growing areas to those where population stagnate or decline? In other words, will the history of migrations repeat, as for example in the great migration from Asia to Europe 1000 years before Christ?

Why have we neglected demographic research in Montenegro and Serbia? There are some exceptions, so some universities organize Demography courses... However, there are very few research projects in demography research. What are the reasons for such situation with demography research?

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2. 2050

There are different classifications of megatrends which will shape the world in next few decades. Most of these projections reach 2050. Why the year of 2050? The reasons are mostly mechanical. This is the half of the first century of the new millennium. I believe this express the fact that people are becoming aware that current model of organizing civilization is being exhausted. New big world transition will follow. Will it be painless, as Thomas Freedman claims, or conflict and turbulent, as Jacques Attali says - this issue is irrelevant for the discussion in this paper. It is important to understand that one world is being created. This doesn't mean that an end to the world has come. No! It just means that the new world is being created. And this world is non-predictable...

Which global forces (megatrends) will shape this world in the shortest future?

1. **Population**, i.e. changes in population. "Demographic flat board" is one of those on which we organize our lives, our societies and states, because we don't live in some vacuum, but in the real world. Unfortunately, similar to our ancient forefathers, we live with some myths. Unlike them, these myths don't help us to understand the world better. Typical myth that a contemporary man lives with is the myth of national state and its eternity. Other, more dangerous myth - a modern man is thinking that the state is that "board" on which he lives. Demographic "board" leans on the "board" of the planet Earth If these two "boards" clash, the state will hardly be able to survive in current form. In a nutshell, demographic changes seriously endanger current organization of the society, including the state.
2. Second force, which is taking place of the most important one are **resources,** i.e. growing demand for resources, due to the growth of population and the development of new technologies. Indeed, this force includes human demand for natural resources and the "gene pool" of our planet. Natural resources are related to hydrocarbons, minerals, river, arable land, forests; natural services, which are the essence of life on this planet, such as photosynthesis, absorption of carbon dioxide by the oceans... At the end, there is diversity - maintenance of the diversity of all live beings on the Earth.
3. The third force, which shapes this world, is the **globalization**. Despite many definitions, I consider that the globalization is related to the process of abolishing borders, i.e. economic, social and technological processes which makes the world more connected and interdependent. For all anti-globalists Thomas Freedman has the question: "Where have you been when the world was becoming flat?". This is Friedman's simple metaphor for openness, which is making the global field flat for trade, labor and capital mobility, with the goal to maximize efficiency and profitability, i.e. to come to the

farthest "corners of the world", where the cost of resources and labor is minimal.

4. Forth force is the **climate changes**. The climate has shaped this world. This process is continuous and still lasts: human industrial activity change chemical composition of the atmosphere and it causes the growth of temperature on the Earth, which has consequences. Back in 1820, French mathematician Fourier tried to prove that the temperature on the Earth is much higher than it should be according to the distance from Sun. Without this, ring of gases which "wraps" the Earth would make our planet "ice box" similarly to the Moon or Mars... Do these facts emphasize the need to face the challenges of meteorology development and the influence of meteorology to the future economic activities?...

If we accept these forces as elements which shape the world and life at this planet, can we afford to ignore them? Or, will the fact that we accept these forces just serve as justification to build the new world through new constructivism and strengthening today's bureaucratic logic? Instead of bureaucratic answers ("put everything under control of smart bureaucrats") should we face the changes through **creative adaptations**? Do we need more vision? Should we learn more "from the future"? Don't these shaping forces already provide us certain "aroma of future", that we have to adapt to? Does our brain and mental force enable us to adapt these changes to us and our needs through technological innovation?

3. Demographic Megatrends

1. **Accelerated growth of the world population** - On October 31st 2011 the world has celebrated the birth of the seven-billionth person on the Earth. All global TV stations announced the birth of Nargis Kumar from India and he became famous. The birth of six-millionth person on the world, Sarajevo's citizen Adnan Nevic, was celebrated on October 12th 1999. Adnan celebrated his 12th birthday, few days before the birth of seven-billionth person was announced. It means that the world population increased for one million in just 12 years. That is approximately the same period within which the world population increased from 5 to 6 billion people (1987-1999). In other words world population increased for 2 billion people in 24 years.

   How fast the world population grew in the past?

   Human population on the planet Earth needed 250.000 years to reach one billion people - in 1800. Next billion was reached in the following 100 years. In 1917 the world population reached 2 billion. Since my mother was born, 87 years ago, the population at this planet increased for 5 billion people or

2.5 times. Estimates say that the world population will reach 9 billion people in 2050.

What will be the economic, political and social consequences of this demographic explosion? Do we believe that everything will remain the same - that we will just "raise the level of population" in current national borders, similar to the level of water in hydroelectric power plant reservoirs, or "the dam will be over-flown" under the pressure of new population, which means that new territories, which are not under strong population pressure now, will be settled in future? Will administrative borders be able to stop natural strength of new, increased population, or migration will change the world and the distribution of population in the world?

2. The growth of population is **regionally unequal**. Some populous countries today, have already reached peaks, so depopulation i.e. population stagnation or decline in such countries is expected. For example, the population of Russia declines from 1995, the population of Japan peaked in 2010 (it reached around 200 million), while the population of China is expected to reach its peak in 2025 (around 1.4 billion). Even the population of India (which will be the largest population in the world by 2020), will slow its growth and reach the peak of around 1.7 billion around 2050.

   On the other side, population of some countries will grow rapidly. For example, Nigeria had the population of 57 million in 1970, while the estimates say that it will reach 389 million people in 2050. That will make the number of inhabitants in Nigeria equal to the number of inhabitants in US. Tanzania's population grows even more rapidly - from 14 million in 1970, to around 139 million in 2050. Global population projections say that by 2100 Nigeria and Tanzania will have the third and the fifth large population in the world respectively.

3. **The relation** between **the populations of different continents** will drastically change. Asia will remain the most populous continent with around 50% of the world population. However this is very significant decline, because in the year of 2000 around 2/3 of total world population lived in Asia. At the beginning of this millennium, Europe and Africa had approximately the same number of inhabitants. Estimates say that in the year of 2050 population of African continent will be 3 times bigger than the population of Europe. One half of projected growth of 2.3 billion people by 2050 will live in Africa.

4. The world population grows, but the average age also rises, which means that **the world population is getting older**. The population older than 65 will double by 2050 - from 8% in 2000, to 16% in 2050. The median age will grow from 30 years to around 38 years in 2050. Life expectancy will be around 100 years in many developed countries.

5. More numerous and older world population will live in **urban areas**. At the moment around 50% of total world population lives in cities. In 2050 around 70% of the world population or 6.5 billion will live in cities - that is approximately the total world population from the year of 2005. From 2025 there will be 30 megapolises (cities with more than 10 million people); while in 1950 there were only 2 megapolises - New York and Tokyo. However, projections of Mc Kinsey Consulting say that cities with the population of 10 and less million inhabitants will have the most rapid economic growth. They noted that around 400 such cities will drive economic growth in developed countries.

6. Demographic megatrends will also have **impact on family** - family size and life expectancy. In 1950 the world consisted of two completely different groups of countries - rich and poor. Life expectancy in poor countries was shorter (averagely 37 years), while average family size was 6 members or more. Projections for 2050 says that there will be rich and poor countries, however there will be no so strong distinction between these countries with respect to the life expectancy and average family size. Convergence processes have started and the result will be average family size of 4 members (with two children) and life expectancy of 70 years in all countries of the world.

4. Demographic Megatrends - consequences

What will be the consequences of the above demographic megatrends?

Of course, I believe that an answer to this question will be researched in many comprehensive and deep demographic analyses in following decades. The area of demographic research will develop in future - maybe it can bring back the popularity such research had in previous century, during 60's. This can be important information for young research oriented people.

The consequences of demographic megatrends can be considered from several points of view:

1. Demographic consequences;
2. Social and economic consequences;

3. Territorial consequences.

1. Demographic changes caused by previously described trends will have the strongest impact on **fertility rates.** Ageing of the population will cause decline of fertility rates in all countries. Projections say that in 2050 the reproduction rate (which show average number of children per one woman in fertile age) will be 2.1. It is so called simple population replacement rate. Of course, the value of this rate will be different in different countries. However, this is so called magical rate, which prevents population decline. Of course, this implies low baby mortality rates, because baby mortality rates express the humaneness and efficiency of human reproduction in one country. The reproduction rate was 4.45 in 1970 and average family had 4-5 children. In 2010 simple reproduction rate were 2.45, while half of the total world population today lives in countries with simple reproduction rate of 2.1. Estimates say that around 2050 all countries except those in Africa will have reproduction rate less or equal to 2.1. Long term fertility tendency (reproduction rate of 2.1) will result in decline of population growth and the stagnation of population. The truth is also that there are projections which say that around 2300, the world population will reach 23 billion[1]. However more likely estimates says that population growth will come back to the level of 0-0.5% yearly from before 1800, when demographic jump has started (primarily due to the decline of mortality rates). If these estimates come true, it will be the end of demographic revolution worldwide.

2. Does this mean that the fear from revival of **Malthus theory** is justified? This, very often criticized and denied, but always very popular, English economist and philosopher claimed that the Earth cannot feed all people which would be born if human reproduction remained unlimited. Food cannot grow as fast as population. While food growth follows arithmetic progression, population grows by geometric progression. This means that the growth of population must be limited. One of the measures for limiting population growth is the war. This raises the question if fast growing world population will cause wars and political violence in next few decades. In other words, are wars indeed the mean to balance the growth of the world population and the amount of food on this planet? An issue related to this is the fear from economic catastrophe: too many people on this planet along with the growth of industrial production impoverish natural resources, and at the same time change the structure of the atmosphere. This paper has no intention to try to give an answer to a Malthus question. In any case, we can agree that the issue of population is very important - I would quote the thought of Auguste Comte, French philosopher and the founder of sociology that "demography is the destiny".

[1] Caselli, Graziella and other (2004), "*Demography - Analysis and Sinthesis - A Treatise in Population"*, Elsevier;

3. How these demographic megachanges will influence today's *emerging markets?* Emerging markets didn't exist 40 years ago. The director of US banks and investment funds used to say: "There is no (financial) market outside US". This was really the time when reforms of Deng Xiaoping in China has started, when Indira Ghandi nationalized private companies and started to develop socialism in India. Vietnam was still in war, "Chicago boys" were still waiting for the first results of their reforms in Chile, where new President Salvador Aejende, who believed in central planning with the help of 3500 "bourgeoisie computers" had just been elected.

   That's why Western investors were very skeptic about "the third world" countries. "The third world" countries saw the capitalism as exploitation and dependency. The prices of product which had been produced in these countries were very low; profits had been earned by big multinational companies which were "the new colonizers" of these countries. "The third world" was looking for international economic system... Today, 40 years after, this international economic system is being established. The "third world" is in peace with capitalism today. All "third world" countries put efforts in attracting foreign investment. Representatives of these countries are active participants of the big conference in Davos (World Economic Forum), which is "the biggest celebration of capitalistic ideas"... Today, the investment in "the third world" countries amount to around 1000 billion US dollars. These countries produce around 1/3 of the world GDP, and generate 2/3 of GDP growth rate.

   Simon Cox says "When we look back in the time 40 years ago, we look vertically, as if we look down from the 40th floor of skyscraper"[2]. In the meantime economies of the "third world" countries economically developed and international financial institution, the World Bank, first of all, made projection of their economic growth. Thus, economic projections for "5 big" in 1997 were made for China, India, Brazil, Russia and Indonesia. However, political turbulences caused decline of Indonesian economy, so economic projections for "the big" are now related to the so called BRIC countries.[3] Goldman Sax was making economic projections for these countries at the beginning of this millennium, however these projections were already "off track" in 2008, when Chinese GDP reach 4.3 thousand billion. Similarly, real GDP of Russia and Brazil was four times bigger than the ones projected by Goldman Sax.

   Where does this unexpected economic growth come from?

[2] Cox, Simon (2012) "*The age od emerging markets", in "Megachange - the world in 2050"* edited by Daniel Franclin and John Andrews, Economist, London, 2012, pp.153.
[3] BRIC stands for Brazil, Russia, India and China.

First, economic growth has exponential trend. This means that the growth induce new growth. This acceleration and speeding up is the effect of a snow ball... Physicist Al Bartlett claims that "The greatest failure of the human species and human mind is its incapability to understand the essence of an exponential function". It is the truth that growth is speeding up the growth, as current year's growth of GDP is the base for the next year's GDP growth. For example, GDP growth in China was 29% in 2007 and 2008 (primarily due to the exchange rates USD - Juan). This means that 29% was added to the GDP base in each of these two years. In 2007 that was the amount of 780 billion USD, while in 2008 the same growth rate generated the amount of 1000 billion. This speeding up and acceleration results in projections for 2050, which look completely impossible today. Goldman Sax projections say that Chinese GDP will amount to 70 thousand billion USD in 2050, which is the amount 80% higher than US projected GDP and the amount higher than current world GDP. According to these projections US economy will be among 7 biggest in the world in 2050 (on sixth or seventh place), while other members of G7 will be India, Brazil, Russia, Indonesia and Mexico. According to the Goldman Sax projections no country from Europe will be member of G7 in 2050

Secondly, the influence of demographic factor is strong - primarily through big market, but also through big labor contingent. The world labor force (population in age group 20-65) will grow from 3.9 billion in 2010, to around 5.3 billion in 2050. Around 70% of this growth will be from today's emerging markets. It is interesting that the Chinese labor force in this period will decline for around 15% (stagnation and aging of Chinese population), while for example labor force in India will increase from 670 million to about 1 billion, which means, that the labor force in India will increase from around 77% of today's labor force in China, to 141% of projected labor force in China in 2050. Labor force of the African continent will increase from current 380 millions to around 950 millions in 2050. Economies of Tanzania and Ethiopia, which seems irrelevant today, will have the population of more than 130 million each in 2050. That means that the total population of these two countries will exceed current population of Japan.

Increase of the labor force generate economic growth of emerging markets, partially due to investments in physical capital such as equipment and buildings, which are of crucial importance for economic activity of increased labor contingent.

Third factor of the growth is the convergence of labor productivity in these economies toward economies of the Western countries. Changes of labor productivity and its growth express the qualitative changes in the economy and

society overall. Economic progress consists of qualitative and quantitative changes. That's why economic growth reminds me on blooming in the forest, more than the growth of trees. The key driver of this "blooming" is education. If technology is, today as always, the essence of labor productivity, then education, as Edmund Phelps says, "speeds up the process of technological diffusion". Explosion of education in the countries mentioned above, accelerates the development and spreads the new technologies, which consequently lead to increased labor productivity?

In which direction the development will go? Will emerging economies develop agriculture, industry or services? All projections say that by 2050 the share of services in total world GDP will rise? Doesn't this seem illogical if we know that population growth will increase demand for food, water and energy? Will the growth of population bring the need for industry development?

Higher share of service industry in the world GDP doesn't mean that the world will de-industrialize. The demand for industrial goods and food will rise. For example, Goldman Sax projected that the number of cars on streets of India in 2050 will be 3880% higher than today. However, despite the fact that the value of industrial goods production and agriculture will rise, their share in total world GDP will decrease. Why? Because there will be more wealth in the world. Higher income means that share of food and consumer goods consumption in total spending will decrease, while the share of income spent on services will rise (tourism, culture, art...). This is partially the consequence of the fact that food and consumer goods become cheaper, as the productivity growth in industrial production is higher than in services production. When income is growing, even when the prices of consumer goods don't change, larger share of income is spent on services. This is common pattern, which follows the "natural law" described by Abraham Maslow's "hierarchy of needs" in 1943. In a nutshell, more money - more choice!

"All projections for 2050 indicate that big economies will not be emerging any more, and that emerging economies won't be big in the future. Emerging markets did not exist 40 years ago. Forty years from now, emerging economies will disappear from our horizons!"[4]

5. The influence of demographic megachanges on the role and organization of the state

Globalization has already started to erode our perception of national state. Along with the strength of globalization, demographic changes also put the pressure on the

[4] IBID, pp 149.

picture of Leviathan in minds of his fans. The truth is that the logic of the defenders of the state i.e. Leviathan-makers would bring the state in position to crash under the burden they put on its back. It would be very dangerous and could bring the chaos in public finance and leave very difficult social and economic consequences.

What are the consequences of demographic changes on the future role and the organization of the state? Or better put, how will the population aging influence the perception of the role of state?

Undoubtedly, the ageing of population will increase the budget in, at least, two aspects.

First, the number of pensioners who live longer will rise. The rise of the number of retired people is not problem by itself, however rising share of old people in total population is. It means that the base of labor force - young people who produce and create value added - declines, which consequently shrinks the tax potential or tax base in an economy.

Second, older population induces higher costs of health care. Older people require more care, more medicines, medical and health equipment... Thus, the health care costs are bigger several times. The average health care costs for a person older than 65 is 3-4 times higher than a health care cost of younger people. For example an average person older than 85 in England cost the national health care system 6 times more than an average person in age group 16-44. According to the Standard and Poor's projections serious problem of population aging will put the strong pressure on the budget of 30 most developed countries of the world, especially after 2020 (when baby boom generation will retire). They predict the average rise of public spending in these countries will be 10% of GDP annually in the period 2020-2050. The half of this annual growth will be generated by the rise of health care costs; around 3.7% will be induced by the rise of pensions, while remaining 1.3% will be generated by increase of other costs. If we assume that there will be no increase in taxes and budget revenues, then public finance in these countries will get into serious troubles, and net public debt (total public debt reduced for the amount of liquid financial assets) will rapidly grow from 65% of GDP to 329% of GDP in 2050. This fiscal "fatalism" could result in collapsed stress - it would crash under its own burden.

However, the life will not stop there. One perception of the role of state will be replaced by the new perception[5]. The state will have to bring back many functions

[5] In 2006 I proposed the concept of Montenegro - microstate, which means small, smart and efficient state, the state which sets the rules, and all activities are outsourced to private sector. The proposal was rejected. The consequences are becoming visible now.....

and activities to companies and families. At the same time, the state will have to become smarter and more efficient, i.e. "the state of 2050 will be smarter, as well as fitter"[6].

This raises an issue of how much time and intellect will the countries such as Montenegro, Serbia and other countries from the region need to: 1) understand that we need smart (not political state), and 2) to organize such state. Are we aware that political justifications which permanently refer to Europe and European social and welfare state represent the view backward and express the belief that this model will "resurrect" again?... Obviously the wrong "application" of Christian religion ("resurrection") on "this world"...

6. Demographic megachanges - incentive to entrepreneurship and creation

The authors of "Karaoke capitalism" write about trend of individualization in the world. Alain Touraine in his book "The New Paradigm" also emphasize that individuals are turning out to themselves - each individual wants to get to know her or himself better and to build her or his own personality. The idea behind this is that a person who knows him or herself can better understand other people. Bill Gates has created the world of networks, rather than traditional world of collectives and national states... Rifkin writes about the "the age of access" to the networks instead of the age of belonging to the collective. At first sight, it really looks strange that rapid growth of the world population increase the individuality of each person. This reminded me on one very famous thought - "one can never feel as lonely as in the big city".

If this is the case, will future economic activity be organized by some collective entity, such as state? Will people take more care of themselves and listen to themselves and their intuition or will they rely on "gods outside them" (parents, state, church, political parties...)? Now, the fact that 91% of working population in India work in non-formal sector ("work on your own"), and only 9% work in formal sector (state, big corporation), is not wondering for me anymore.

Entrepreneurship and entrepreneurial ideas, individual and family business is becoming the way to earn money for life in the world with every-day growing population. "Creative destruction" should bring us to the business storm. Schumpeter has never been as popular as today, and he will be even more popular tomorrow. His belief that old working methods will be replaced by new technologies is widely accepted and emphasized today. Entrepreneurs are the first ones who see the future. Then they make that picture true in reality.

[6] Wallace, Paul "*Taming Leviathan: the state of the state in 2050" in "Megachange - the world in 2050"* edited by Daniel Franclin and John Andrews, Economist, London, 2012, pp.138

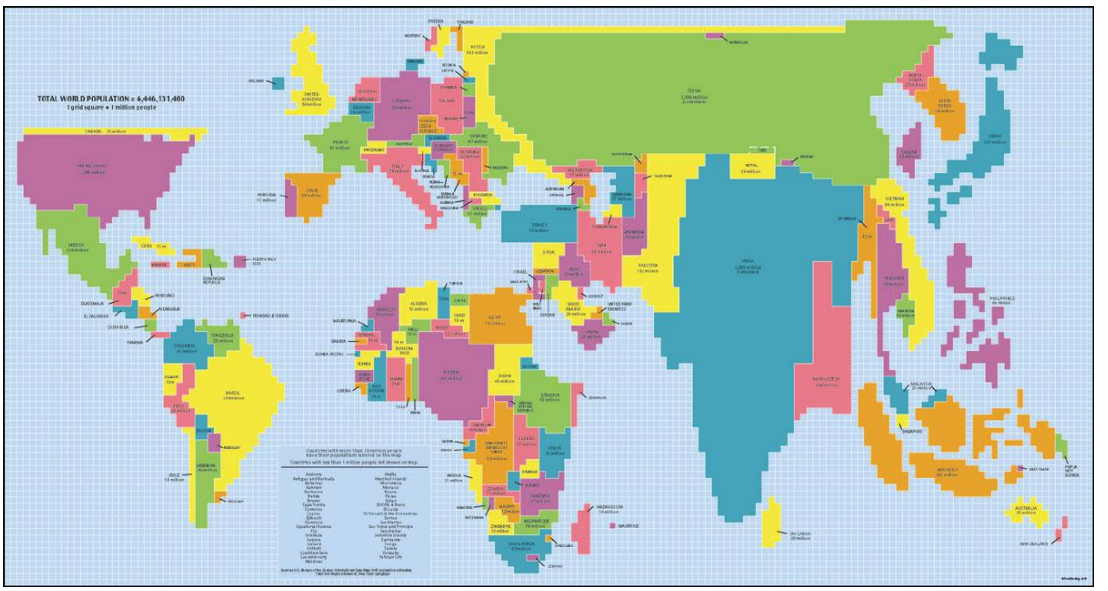
Schumpeter has been ignored in the era of so called managerial capitalism, which has been created during last century. Fathers of the idea of managerial capitalism are Keynes and Galbraith who believed that economy could be governed and managed through rational planning by big companies and state. It is clear today, and it will be even more clear tomorrow, that Schumpeter has been the "prophet" who see further than Keynes and Galbraith, but also he saw further than Carl Marx, who predicted communist ending of capitalism, which is idea supported by Slovenian philosopher Slavoj Zizek today, but also the idea supported by Max Weber, who claimed that rational bureaucracy can manage the development of economy and society overall. Lawrence Summers, Minister of Finance in the administration of US President Clinton and The Chair of Obama's Council of Advisors claims that Schumpeter will be the most important economist of 21st century.

We live in the world of turbulences. Schumpeter explains all those turbulences by a creative logic - entrepreneurial logics. Entrepreneurs permanently generate innovations which give them competitive advantage. These innovations are spreading the waves (multiplication effect) throughout economy and the competition is trying to adapt to these new conditions. Permanent changes, turbulences and uncertainty are the price we have to pay for the increase of productivity.

Technological innovation and global integration in the time of permanent population growth are taking us to new Schumpeter time. According to many, this century will be more similar to 19^{th} than to 20^{th} century; more similar to the century of an individual, the century of free market and business, than to the century of masses, state and politics; it will be more similar to the century of people who believed in themselves and had expectations from themselves, than to the century of people who believed in "Gods outside themselves" and ask the solution from those Gods.

7. Instead of conclusion - demographic map of the world

Look at the demographic map of the world below... This map shows what the world will look like if the borders are determined by the size of population, not by the size of the land. Can we expect that the borders will crash and the "dam will be over-flown" similar to hydropower plants?



Do we need to recall the history and the way this world had been created? Didn't everything started in Africa, over Asia, toward other continents? Is the projected demographic picture for 2050 similar to these origins?

Does all of this mean that all of us at Balkan should turn to new knowledge, creations, innovation; to our cultural inheritance and the development of so called cultural capital, and turn away from borders, military and big administration? How can we finally understand that we cannot defend from these trends by closing, but only by opening?
Opening of our minds, first of all!

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Maja Bacovic[1]

Population trends and Economic Development of Montenegro in XXI century

Abstract: *The results of the 2011 census in Montenegro showed that optimism in predicting demographic trends is not supported. The population of Montenegro is practically stagnated compared to the results of the 2003 census, with changes in the regional distribution with further population decline in the northern region and additional increase in the average age of residents.*
In the meantime, the published projections of world population, revised by UN in 2011 after censuses in most countries were completed, indicated that the most observed trend in most countries is aging of the population in societies that are in post transitional phase or stage of further aging in the process of demographic transition, and Montenegro belongs to such group of countries.
All this lead us to the conclusion that the demographic changes we are facing are much bigger challenge than it may first appear. Therefore, we will analyze trends in the Montenegrin population in the twenty-first century, and then try to see the effects on labor supply, which is an important determinant of economic development.

Key words: *Population, Aging, Labor market, Fiscal policy, Savings, Economic development*

1. Population and Economic development in economic theory

Population, its size and dynamics, attracted the attention of scientists, philosophers and statesmen practically since the beginning of mankind. In China and the Roman Empire, there was periodic counting of certain categories of people, who are essentially very close to the modern census, and whose purpose was administrative or economic. There is even evidence that the Inca counting their populations. However, only in the sixteenth century, the first partial censuses were organized, and the first complete censuses are organized in Europe in the eighteenth century (Finland-1749, Sweden-1750, Norway and Denmark -1769).

Records of demographic analyzes have dated from the fourteenth century, when Ibn Khaldoun developed a theory of cyclical changes in population. According to him, the more densely populated areas have a number of advantages: it is possible to divide and create diverse and specialized occupations, what influence better use of natural resources and assets. Also, political or social security is higher, all of which

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leads to higher income per capita. These positive trends continue to encourage population growth, due to rising birth rate and mortality decline. However, after a while there is a slowdown and delays in the positive direction of the event, and eventually decay occurs. With increasing economic prosperity, luxury spreads and taxes increase, which destroys society and its order, until uncertain political and economic situation does not cause population decline.

Interest for the problems of the population in Europe has started growing in the sixteenth century. Scientists were divided on attitudes regarding faster or slower population growth. Contrary to those who thought that the population increases, the French writers as Montesquieu, Mirabeau older and Robert Wallace claimed that the population was reduced compared to the old days. Montesquieu argued that the population is at a level of only 10% of former numbers.

After empirical data become available, these theories are replaced with those that are based on experience, which shows the general trend of population growth in social development. Population movement was not straightforward and linear, but negative trends were present at specific time intervals. However, the dominant trend was growing population.

In the period from the sixteenth to the eighteenth century certain political, economic and religious reasons were used as the basis for the assessment of population trends. From an economic point increase in the number of people was considered as positive event. This has been influenced by positive relationship between economic growth and population-normal and without major turbulences economic development was usually accompanied by an increase of the population, and vice versa, in times of great adversity (famine, epidemics, etc.), the population is declining. Based on this relationship, it was created the idea of population growth as a factor in the increase of material wealth. Petty wrote that "the small number of people" really means poverty of the country, and a country with 8 million people is twice richer than the country with 4 million. A similar idea can be found in the works of Adam Smith, who said: "The surest sign of the prosperity of a country is to increase the number of its inhabitants."[2]

During the seventeenth and eighteenth century, many scientists made contributions to the theory of population. This process culminates in the learning of Thomas Robert Malthus. Malthus was the author of the first book in the history of human thought that is dedicated originally to the population. General characteristics of the study of population during the period from the sixteenth to the eighteenth century was the target orientation focused on the "discovery" of natural law on the

[2] A. Smith: “Inquiry into the Nature and Causes of the Wealth of Nations”, translated by Global Book, Novi Sad, 1998.

movement of people, which stemmed from the observation of bourgeois society and mode of production as universal and eternal form of society and social production. Law on Population was universal, and the most prominent are natural phenomena. In Malthus's theories idea of production as determinants of population was presented. The first of his two postulates are as follows: (1) The population is inevitably limited by food; (2) Population invariably increases where available food is increasing, unless prevented by some very powerful and visible cause. According to Malthus, there must be a factor that determines the rate of growth of the population, and on the example of North America he concluded is determined by production volume.

In the nineteenth century, there is a theoretical course in England known as "Neo-Malthusianism." Members of this school introduced to the science of population the idea of birth control, which caused high levels of criticism from the Anglo-Saxon public (birth control was considered immoral act in Anglo-Saxon circles). The issue of population during this period was analyzed also by J.St. Mill, who claimed that population should be treated as factors of production. In his theory he introduces a law of diminishing returns, which is manifested in agriculture, as the land, as opposed to labor and capital, can not be indefinitely increased. He believes that yields per capita decline with population growth, which causes a reduction of standards and deteriorating living conditions of the population. This is why certain groups of the population, particularly the working class, must take care not to make the family oversized and thus reduce the standard of living of all members. Although a large number of thinkers dealt with the theory of natural development, and tried each from its corners to make the idea plausible, none of them is completely unable to withstand the test of empiricism, even Malthusian.

As an alternative theory to the Malthus and all other from area of natural population growth, there is a theory that the movement of the population considers as endogenous variable that is strongly influenced by economic and social conditions that influence the growth and scope of the population. In the seventeenth and eighteenth centuries were born ideas of the movement of the population which is dependent on social factors. The reason for such an idea was confusion about the different causes of fertility (fertility) in different environments (urban & rural, poor & rich layers, Christian & Muslim people, etc.). One of the first members of these ideas was William Thompson, who believed that increase in the standard of living, combined with the spread of knowledge causes a reduction in fertility. The idea of the negative dependence that exists between the living standards and the birth is fully developed by Archibald Alison, who believed that "the most important reasons for limiting population growth are the development of the human mind and creation of artificial desires." Marx and Engel also pointed to the relationship between financial status and fertility, explaining social components.

After World War II, there was a drastic fall in mortality and the enormous population growth in underdeveloped and developing countries. Unlike the situation in Western Europe and North America, the impact of population growth on economic growth in these countries was irreversible. Population growth, rather than a source of economic growth, was the limit. One of the reasons for this effect was the fact that the situation in developing countries after World War II was quite different from the situation in Europe and America. In developing countries, macroeconomic policies were pressured to increase fiscal expenditures, particularly expenditures directed towards education, health and social protection. In addition, the rate of population growth in the least developed countries and developing countries in the postwar period was two to three times higher than the rate of population growth in the western countries in the eighteenth and nineteenth centuries, which led to population structure dominated by dependents, representing a further constraint to economic growth in the postwar period.

The high population growth in the postwar period contributed to the return of analysis involving population growth rate in macroeconomic models. Scientists Nelson (1956) and Leibenstein (1954) included the growth of the population as an endogenous variable, which is dependent on the income. Their models were Malthusian and assume a positive relationship between the level of income and the rate of population growth. Nature of the relationship between the level of per capita income and population growth rate is determined by the rate of growth of total income and population: if the population is growing faster than the total income (population growth rate is higher than the growth rate of income), income per capita will be reduced.

In addition to Nelson and Leibenstein a significant contribution to the analysis of the impact of population on economic growth was given by Coale and Hoover (1958). They constructed a mathematical macroeconomic model aimed for projections of per capita income in terms of low, medium and high fertility rates (fertility rate is an exogenous variable in the model). Their analysis resulted in the conclusion that, assuming high fertility rates, per capita income in 30 years can be up to 40% lower compared to the scenario where the fertility rate is low. Following the publication of their work, many of the assumptions that were included in the model are criticized and reviewed and their conclusions have been challenged. However, their work is considered valuable because it pointed to:

- The importance of demographic factors in macroeconomic research
- Caution when devising economic policies, suggesting that the rate of economic growth is not the only variable to be taken into account and be set as a target;

- The importance of consideration of demographic trends in developing countries, and an analysis of their impact on economic categories.

Work done by Coale and Hoover was the base for many quantitative and econometric studies that emerged later. Models that include demographic components focused on the analysis of fiscal expenditures (education, health, social security) and the impact of demographic change on the same. Also, a number of models dealt with the relationship between population growth and the state of the labor market

Although were published a number of papers dealing with mathematical models, a much larger number is of those who have tried to point descriptively the relationship between demographic changes and socio-economic categories:

- **The production volume**. Population growth causes an increase in demand for products and services and has a positive effect on the level of income that is realized in the economy.
- **Savings.** Changes in the age structure of the population have an effect on the level of national savings. Much of the analyses indicate that the population older than 65 years is entering a phase of negative savings. From this it is concluded that the larger the share of people older than 65 years, the level of national savings is lower.
- **Labor market.** High fertility rates indicate an increase in the participation of the active labor force in the total population in the future. The opposite is not necessarily true, that low fertility rates do not cause an increase of the active labor force, due to the fact that the increased supply of labor is not only the result of population growth due to high fertility rates, but also increase the number of people aged 15-64 years who are ready to join the labor market. Here we focus on the members of the female population who, because of a small number of children are becoming increasingly economically active.
- **Education.** The rapid population growth has a strong effect on the cost of education. Increase in the cost of education may be the result: an increase in salaries of education, schooling population growth rate and increase in the number of children. The third factor is directly dependent on the level of fertility rates, and high fertility rates in the future leads to rise in spending on education. Of course, spending on education can be maintained at the same level as a consequence of changes in the relationship teacher / student, i.e. increase the number of students (students) per teacher, or as a result of reducing the number of years of schooling.However, these measures directly result in reducing the country's stock of human capital, which reflects negatively on the rate of economic growth.

- **Health.** Population growth causes a rise in the cost of health care as more people seek more health care services. High fertility rates have a direct and simultaneous impact on health care costs (not delayed as in the case of education) due to the fact that children by birth become users of health care services.

2. Population and economic trends in Montenegro

Analysis of the economic situation in Montenegro, like in countries of the region, indicates, among other things, the following:

1. Low level of national savings,
2. High budget expenditure budget, in which the high costs of pension insurance, health care and social security,
3. Low economic activity of the population and the high rate of unemployment, that's more structural than the result of a lack of demand for labor;
4. Small local market and significant dependence on imports.

These are just some of the variables that determine the current economic condition, as well as economic growth. Although the change of each of these variables largely determine the economic categories, such as income level and the ratio of consumption to disposable income, output and investment in the production of internationally competitive products, the movement of economic variables is significantly determined by trends in population and characteristics of the population living in a particular area.

Population and savings. Although the savings is determined by level of income, savings propensity and expected interest rates or rates of return on investments in various securities, a significant factor in the level of national savings is the age structure of the population. As a rule, the economically active population (employees) have positive, while the economically inactive population (pensioners) have a negative savings - spend income accumulated during their working life. Decrease in the share of the first and increasing the participation of others in the total population has overall negative impact on national savings, which could be anuled if a negative effect is compensated by faster growth of income of employees in relation to the growth rate of economic dependency of older persons[3].

Economic activity and population. Standard of living is determined by income per capita, produced by economically active population and consumed by all, both employed and unemployed persons, and persons with personal income and

[3] The ratio of people over 65 and people aged 15-64 years.

dependent people. Any decrease in the share of employees in the total population affects reduction in average income, again if it is not offset by faster growth of wages. This relationship steadily deteriorates in Montenegro, and currently ration of employed to other people is 1 to 3.5.

Based on the data obtained in the Labour Force Survey for 2011[4], the main characteristics of the labor market in Montenegro are: Low total economic activity of the Montenegrin population (48.7% of the population over 15 years are active participants in the labor market, while regional analysis indicates the lowest economic activity in the northern part (39.3%) and highest in the central region (54.6%) of which Podgorica has maximum with 58.2%); high unemployment rate - 19.7% of the active population is unemployed, while the northern part is characterized by the maximum rate of 32.7 %; the unemployed person are dominately individuals who have been unemployed for more than 2 years - 66.3%, from 13.3% 12-23 months, while only 18.5% of the unemployed are unemployed for less than a year; an analysis of the educational structure of the unemployed shows the dominance of the unemployed with secondary education (44.6%), while highly educated people makes 12.8% of the unemployed.

Population and pension expenditures. In Montenegro, like in most countries in the region, the so-called "Pay as you go" pension system is aplied, a system where the funds for payment of pensions predominantly were provided from revenues from ongoing payments of pension insurance. The system is efficient and liquid as long as the current revenues are equal or exceed current expenditures, ie. while income and number of employees who make contributions are greater than the number of pensioners and their monthly fees. Year after year, this ratio is distorted under the influence of two key factors: the rapid growth in the number of pensioners and the much slower growth of employees and wages. The consequence of this trend is the growing deficit in the finances of pension systems, which is currently in Montenegro equal to 70% of total revenues[5]. Any further deterioration in relations between employees and retirees will further increase the problem of sustainability. In addition to the pension system, a growing problem is the financing of health care costs, which increase almost proportionally with the increase in the average age of the population.

3. Population in Montenegro at the begining of the XXI century

[4] Source: Monstat

[5] According to the report of the Pension Fund of Montenegro in 2012, the total expenditure of the pension insurance in 2012 in Montenegro amounted to € 382 million, income from pension contributions are estimated at € 225 million; while the missing € 152 million are plan to be financed from the Budget of Montenegro.

The results of the census, which was conducted in 2011 in Montenegro showed that the demographic picture is worse than even most pessimistic predictions. The population in relation to the results of the previous census has been reduced! The key contribution to negative growth rate of the population is given by negative migration balance, which according to rough estimates, was approximately 12,000 inhabitants[6].

Census pointed to the significant internal migration, ie. displacement and migration from north to the central and southern Montenegro. Primarily as a result of negative internal migration, the population of all municipalities in the northern region (with the exception Rožaje) is reduced.

Table 1: Number and average age of population in Montenegro, censuses from 2003 and 2011

	Population			Average age		
	2003	2011	%	2003	2011	%
Montenegro	**620,145**	**620,029**	**-0.02%**	**35.9**	**37.2**	**3.62%**
Andrijevica	5,785	5,071	-12.34%	38.2	39.9	4.45%
Bar	**40,037**	**42,048**	**5.02%**	**36.9**	**37.9**	**2.71%**
Berane	35,068	33,970	-3.13%	35.1	36.4	3.70%
Bijelo Polje	50,284	46,051	-8.42%	34.3	36.1	5.25%
Budva	**15,909**	**19,218**	**20.80%**	**35.7**	**36.5**	**2.24%**
Cetinje	18,482	16,657	-9.87%	38.1	40.3	5.77%
Danilovgrad	**16,523**	**18,472**	**11.80%**	**37.2**	**38.1**	**2.42%**
Herceg Novi	33,034	30,864	-6.57%	38.2	40.0	4.71%
Kolašin	9,949	8,380	-15.77%	38.2	40.1	4.97%
Kotor	22,947	22,601	-1.51%	38.1	39.5	3.67%
Mojkovac	10,066	8,622	-14.35%	35.7	38.4	7.56%
Nikšić	75,282	72,443	-3.77%	36.2	37.8	4.42%
Plav	13,805	13,108	-5.05%	34.1	36.0	5.57%
Pljevlja	35,806	30,786	-14.02%	39.2	41.8	6.63%
Plužine	4,272	3,246	-24.02%	40.4	43.7	8.17%
Podgorica	**169,132**	**185,937**	**9.94%**	**34.7**	**35.7**	**2.88%**
Rožaje	**22,693**	**22,964**	**1.19%**	**29.9**	**31.7**	**6.02%**
Šavnik	2,947	2,070	-29.76%	40.7	42.5	4.42%
Tivat	**13,630**	**14,031**	**2.94%**	**37.2**	**38.0**	**2.15%**
Ulcinj	20,290	19,921	-1.82%	36.2	37.8	4.42%
Žabljak	4,204	3,569	-15.10%	39.7	41.9	5.54%
North	194,879	177,837	-8.74%	35.6	37.3	4.94%
Central region	279,419	293,509	5.04%	35.5	36.6	3.25%
South	145,847	148,683	1.94%	37.2	38.4	3.26%

[6] Estimates of the population of Montenegro by mid-year intercensal period in Monstat are performed on a database of natural changes in population. The last assessment was done in 2009, when the population was estimated from 631,536. In the next period (2010-11) population growth was positive.

Source: Monstat – Population census, 2011.

In addition to the total depopulation, the key characteristics of the population is aging - the average age of the population increased by 1.3 years. However, the aging population is the most intense in the northern region, where the average age even reached 43.7 years (Pluzine).

Table 2: Age structure of population in Monteneghro, censuses from 2003 and 2011.

	2003	**2011**	**%**
0-14	127,461	118,751	-6.83%
15-64	412,982	421,693	2.11%
65+	79,702	79,585	-0.15%
Ukupno	620,145	620,029	-0.02%

Source: Monstat – Population census, 2011.

Changes in the age structure of the population of Montenegro are also worrisome - population aged 0-14 years was reduced by as much as 6.83%. Nevertheless, if current demographic Montenegro is worrying, if positive external migration balance changes do not contribute to the situation in the future, we may expect further complications and challenging economic decisions for creators of economic policy.

4. Population in Montenegro during XXI century

An analysis of the population of Montenegro in the XXI century has been based on estimates of population trends and estimates published by the Office of the United Nations.

Projections of the population (UN) for Montenegro by the end of the XXI century point to two key trends: (1) reducing the population by 27% by the end of the century, and (2) a significant increase in the average age of the population to a level of 45.7 years.

Table 3: Population projections for Montenegro (United Nations 2011.)

	Population	Age structure				Average
Year	(000)	0-14	15-59	60+	80+	age
1950	399					21.3
2011	632	19.1	62.8	18.1	2.5	36.2
2025	635					
2050	605	15.1	54.1	30.8	6.4	45.3
2100	499	16.0	50.7	33.3	10.8	45.7

Source: United Nations: World Population Prospects, The 2010 Revision, Volume I: Comprehensive Tables, New York, 2011.

Projections of the population of Montenegro[7], based on a cohort model, and the assumption of constant total and specific fertility rate during the projection period and the probability of survival to age obtained by constructing mortality tables based on average specific mortality rates in the period 1991-2003 for men and female (presumably on migration is shown in the table below), indicate similar demographic tendency to those that provide the United Nations.

In 2031. population from Montenegro enters the zone of negative growth, that by the end of this century will lead to the total population reduced by approximately 30%.

Table 4. Population in Montenegro from 1991-2091 (cohort model)

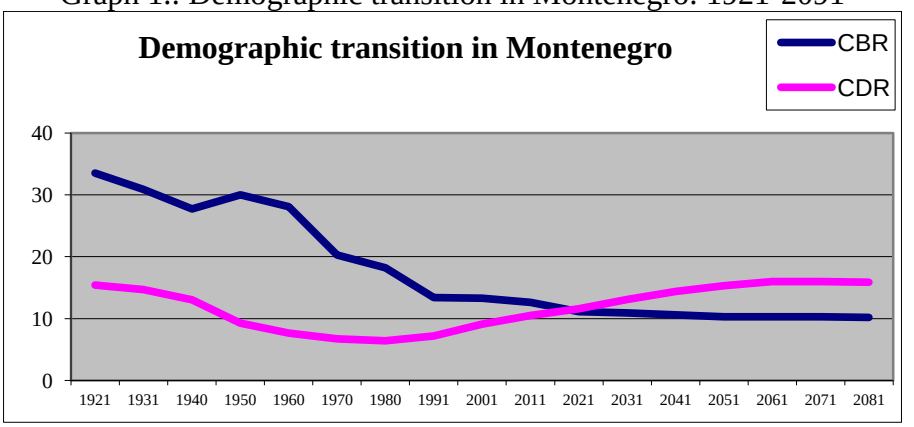
Population		**Average annual growth rate %**	**Average annual growth**	**Annual net migrations**	**Annual natural increase**
Year	**Population**				
				(including deaths)	
1991	591,369	0.49	2,926	(800)	3,726
1996	606,000	0.34	2,059	(1,100)	3,159
2001	616,296	0.34	2,110	(500)	2,610
2006	626,845	0.29	1,805	(200)	2,005
2011	635,872	0.19	1,205	(100)	1,305
2016	641,895	0.06	390	(50)	440
2021	643,844	-0.06	-362	(50)	-312
2026	642,036	-0.13	-855	0	-855
2031	637,761	-0.22	-1,371	0	-1,371
2036	630,904	-0.29	-1,846	0	-1,846
2041	621,676	-0.37	-2,304	0	-2,304
2046	610,156	-0.45	-2,693	0	-2,693
2051	596,693	-0.50	-2,962	0	-2,962
2056	581,881	-0.54	-3,110	0	-3,110
2061	566,329	-0.56	-3,141	0	-3,141
2066	550,622	-0.57	-3,089	0	-3,089
2071	535,175	-0.56	-2,989	0	-2,989
2076	520,232	-0.56	-2,882	0	-2,882
2081	505,821	-0.57	-2,842	0	-2,842
2086	491,610	-0.58	-2,801	0	-2,801
2091	477,603				

To the negative trends of the Montenegrin population in the XXI century suggests a scheme that demonstrates the process of demographic transition. At the beginning of

[7] Maja Baćović: *Demografske promjene i ekonomski rast – analiza investicija u humani kapital*¸ ISSP, Podgorica, 2006.

the XXI century, Montenegro enters the post-transition phase of demographic transition, characterized by almost equal birth and death rates, and both are slightly higher than 10 parts per thousand. Post-transition phase will be completed in the third decade of the twenty-first century, when the population of Montenegro will enter a phase of further aging, which is recognized by the constantly declining rates of population growth, low fertility rates and the aging of the total population.

Graph 1.: Demographic transition in Montenegro: 1921-2091



1.1.1.1.1

The age structure of the population in Montenegro. While the age structure in Montenegro in 1991 (2001) characterizes as a "mature", age structure in 2051 is classified in the category of "old" people. The average age of the population increases, with a simultaneous increase in the share of the population aged 65 years and decline in the share of younger population.

1.1.1.1.2

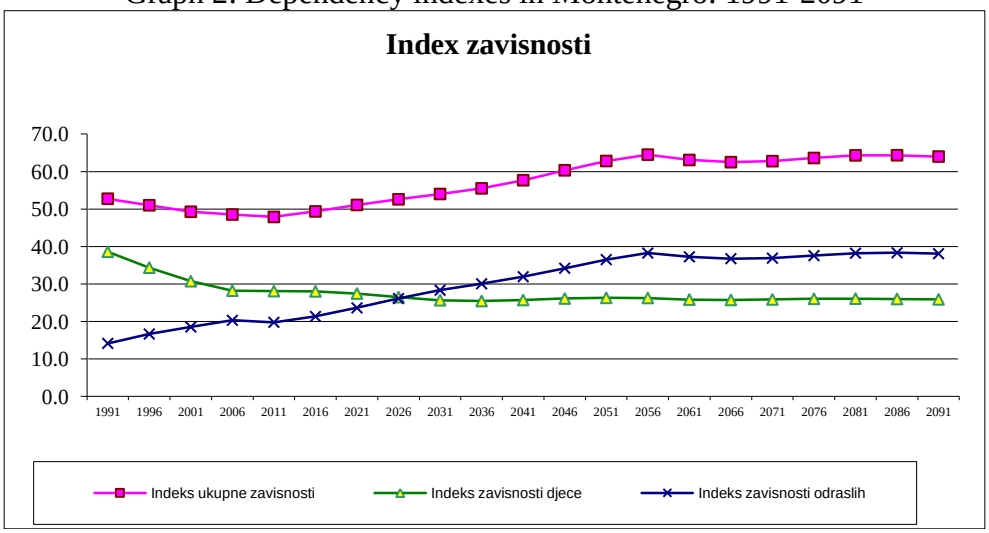
1.1.1.1.3 *Dependency index*[8]. ***Index provides analysis of the age structure of the population, with particular emphasis on the relative ratio of "unproductive-dependent" group and the "productive" group. The indicator is based on the division of the population into three age groups: children (0-14), the population of working age (15-64) and elderly people (65 +). (D. Rowland, 2003).***

1.1.1.1.4

[8] Dependency index represents the number of children per thousand persons of working age. Elderly dependency index indicates the number of elderly residents per thousand people of working age. Total dependency index indicates the total number of dependants (the sum of the number of children and old people) per thousand of working age people.

1.1.1.1.5 Toral dependency index will increase from 51.7 (1991) to 57.7 (2041) and further to 64.0 (2091). Overall growth of the index is heavily influenced by the increase of the elderly dependency index, which will increase from 14.2 (1991) to 38.1 (2091). Dependence of children will decline from the level of 38.6 (1991) to 25.9 (2091), due to low fertility rates and reduce in the number of births over time.

Graph 2: Dependency indexes in Montenegro: 1991-2091



The index of total dependency in developed countries in 2050. is projected to the level of 71 (in 1990 amounted to 50), while in the less developed countries is expected to reduce to the level of 54 (in 1990 - 67). Demographic trends in Montenegro can be compared with the trends that are present in developed countries, due to the fact that they are at the same stage of demographic transition.

5. Impact from demographic changes to labor market in Montenegro

In order to analyse inpact from demographic changes to labor marker, scenario of employment growth and productivity in Montenegro was simulated for the period from 2009-2030.

Inputs and assumptions are:

1. The projection of the Montenegrin population in the period up to 2031.[9]
2. The growth of economic activities creating GDP of Montenegro:

[9] More in: Maja Baćović: «Demografske promjene i ekonomski razvoj», Podgorica, 2006

a. The annual increase in hotel services and restaurants - 5%
b. Annual growth in the construction sector - 3%
c. Annual growth in manufacturing industry - 5%
d. Annual growth in other sectors - 4%

3. Growth in production resulted from the combination of two factors:
   a. Productivity growth
   b. Growth in the number of employees

   The growth in tourism and construction is caused by increased employment by 0.7, while productivity contributes to growth with 0.3 units; in other sectors, the assumption is that the growth of production result of employment growth by 0.5 and productivity growth of 0.5 units.
4. The growth of activity rate of 0.33% per year
5. The natural rate of unemployment - 4%

Projecions are presented in table 5.

Table 5. Projections of GDP and employment in Montenegro: 2009-2030.

	GDP (000)	Population 15-64 age	Number of employees[10]	GDP pc	GDP per employee	Active population	Surplus/deficit of labor[11]
2009	2,980,697	428,265	213,600	4,705	13,955	264,000	39,840
2010	3,113,103	429,123	218,171	4,905	14,269	262,216	33,556
2011	3,239,398	429,983	222,843	5,094	14,537	263,626	30,238
2012	3,370,874	429,940	227,619	5,291	14,809	264,487	26,288
2013	3,507,745	429,897	232,502	5,496	15,087	265,350	22,234
2014	3,650,236	429,854	237,494	5,708	15,370	266,217	18,074
2015	3,798,580	429,811	242,597	5,929	15,658	267,086	13,806
2016	3,953,019	429,774	247,814	6,158	15,952	267,962	9,429
2017	4,113,807	428,914	253,148	6,405	16,251	268,326	4,445
2018	4,281,209	428,057	258,602	6,662	16,555	268,691	-658
2019	4,455,498	427,200	264,177	6,929	16,866	269,056	-5,884
2020	4,636,962	426,346	269,878	7,206	17,182	269,422	-11,234
2021	4,825,899	426,148	275,708	7,495	17,504	270,203	-16,313
2022	5,022,621	425,909	281,668	7,805	17,832	270,961	-21,546
2023	5,227,451	425,671	287,763	8,128	18,166	271,721	-26,911
2024	5,440,729	425,433	293,996	8,465	18,506	272,483	-32,412
2025	5,662,806	425,194	300,369	8,815	18,853	273,247	-38,052
2026	5,894,049	420,784	306,887	9,180	19,206	271,323	-46,417
2027	6,134,841	420,174	313,552	9,568	19,566	271,841	-52,584
2028	6,385,581	419,565	320,368	9,972	19,932	272,361	-58,902
2029	6,646,685	418,956	327,340	10,394	20,305	272,881	-65,374
2030	6,918,585	414,113	334,470	10,848	20,685	270,635	-74,660

[10] Data on employees were taken from Labor force survey (2009).
[11] Natural unemployment rate – 4%

Scenario based on these assumptions leads to the following:

1. If Montenegrin economy achieves growth in these sectors in line with the expected rate, Montenegro by the end of this decade have very low unemployment rate, in fact, will face a deficit of labor force
2. Importing labor is certain even before the 2018th year, if the active population of Montenegro is not able to answer to demand from labor market, in terms of quality
3. GDP growth at an average rate of 4%, which relies on new investments and improving technology, combined with increased employment by 2.0% per year, will result in growth of labor productivity to a level of € 20.685 / employee, or GDP per capita of € 10.848.

Conclusion

The analysis of demographic trends in Montenegro, from a quantitative point of view based on the demographic account created, indicates clearly and continuously aging population. The aging process has started in the twentieth century, and has intensified in recent decades, and continued in the XXI century. Projections of the population show that as early as the third decade of the century, the population growth rate will be zero, and subsequently performed phase of depopulation and aging population further.

Demographic change, in addition to the effects of natural factors (low birth and death rates) are additionally caused by the mechanical changes - high emigration from Montenegro, especially the young and educated people, which is the dominantly motivated by a number of opportunities to enhance the quality of life that allows emigration.

Trends have primarily negative impact on economic development, especially due to:

- Increase in expenses of dependents (mainly people older than 65 years), which are funded from tax revenues or direct or indirect income earned by productive members of society, or directly from the productive members of the household income. The ultimate effect of increasing the ratio of dependents and productive population is to reduce the overall standard of living, if not offset by an increase in productivity of producers, at least to the extent that the per capita income is not reduced
- Increase in health expenditure as a result of rising health care costs of aging population;

- Reduced national saving, because older people typically have a negative savings (spending income generated in the productive age);
- Reduced potential workforce due to reduced inflow of young people;
- Reduced demand due to decline in population and therefore reduced production[12];
- Decreased incentives to invest in new technologies due to reduce in local market size.

In addition to negative effects, depopulation and aging population have positive effects, which are reflected in:

- Increase in investment in human capital per capita as the available capital is allocated to a smaller number of people;
- Reducing fiscal expenditures intended for investment in infrastructure (eg, schools) because of the reduced number of users.

This effects are generally referred to, and not exclusive and definitive. Their strength is influenced by numerous factors and processes that are the result of strong interdependence that exists among all social and economic categories. However, one can conclude with high certainty that the demographic potential and perceived changes in the traditional sense will not have a positive impact on economic growth in Montenegro.

This is the reason that attention should be focused on the qualitative characteristics of the population of Montenegro - human capital, investment in human capital, knowledge and technology, ie. investment in increased productivity and efficiency of the resources used. Theoretical and empirical models that have been developed at the end of the twentieth century go in favor of this conclusion.

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[12] This is dominantly important for products produced for local market. International trade and openness will make this problem smaller for products which can be exported.

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Need for Pension Reform in Europe

Abstract: *There are number of reasons for the adoption of new pension systems in Europe, but the most important of these are, no doubt, big and rising fiscal deficit and the demographic challenges faced by most countries.*

Both of these emphasize that changes in pension system should not be only cosmetic, like adjustments in retirement age or adjustments in level of pension. The change should be fundamental one, change in predominant paradigm which is fundamental to welfare state pay-as-you-go system and social security system.

Key words: *Pension reforms, Demographic changes, Population aging*

Introduction

In the EU, social system is still ruled by "welfare state" ideology. Public pay-as-you-go pension systems represent the most important income source for the elderly, covering some 90% of retirement income provision. The minimum age requirement for old age pensions is generally 65 years across the majority of European Countries.

Big and rising fiscal deficit and adverse demographic changes in Europe will make financial burdens of existing public pay-as-you-go pension systems enormous.

For purpose of this research, the most relevant components that show the need for pension reform are data on:

- public debt in EU countries and liabilities of EU countries pension system
- pension assets of population to GDP, as well as
- dynamic related with population aging, as those are directly linked with pension and social systems in respective regions.

Fiscal deficit and pension assets in EU

Pension system based on "generation solidarity (pay as you go)" means that current pensions are financed from contributions of currently employed workers. Pensions are a legal obligation of the state and pensioners are legally entitled to receive a monthly payment. No matter what current revenues the pension fund receives, the state pension fund is obliged to pay pension to all pensioners.

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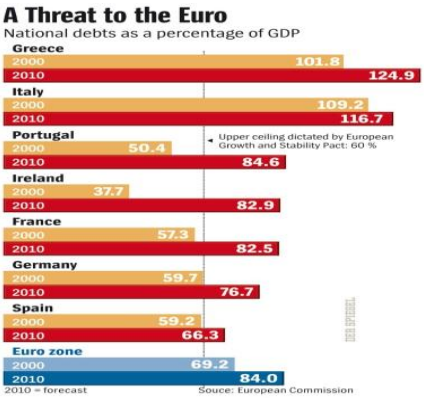
The official public debt has exploded in most European countries, despite the Maastricht Treaty ceiling of 60% Debt/GDP.

The following table[13] shows that in most important European countries public debt has exceded ciling and that the average public debt in EU zone is 84%.



The enormous burden is even more emphasized if presented as a compounded figure, which put together official public debt, pension, health and welfare payments promised by the governments.

Tabele 2: Official debt + Pension + Health + Welfare; as % of GNP[14]

Greece	875%
France	549%
Portugal	492%
Germany	418%
Ireland	405%
Italy	364%
Spain	244%
EU 25	434%

State-funded pension obligations in France and Germany are three times the GDP of those two countries. Together they total 13.9 trillion Euros, very nearly half of the pension bills of the EU States, while in the UK state-funded pension obligations is 94% of GDP.[15]

[13] Eurpoean Commission projection for 2010.
[14] Source: Jagadeesh Gokhale, *Measuring the Unfunded Obligations of European Countries* Policy Report No. 23 January 2009, National Center for Policy Analysis
[15] Wordpress, EU Crisis Scandal, Access at: http://hat4uk.wordpress.com/2012/01/12/eu-crisis-scandal-pension-liabilities-of-france-germany-are-half-of-eu-total.

Another big concern about pension system is inadequate saving by workers. The Nederland and UK have large private pension system, while in four big countries that concentrate the bulk of EU population and GDP (Italy, Germany, France and Spain) entitlements are deeply entrenched in a welfare state culture and those countries have unfunded public pay-as-you-go pension systems.

A pension asset as a percentage of GDP in 2010 that is accumulated in some developed countries[16] is presented in the next table.

Table 3: Savings – shown as % of pension assets to GDP

1	Netherlands	135,0%
2	United Kingdom	86.6%
3	Ireland	49.0%
4	Portugal	11.4%
5	Spain	7.9%
6	Germany	5.2%
7	Italy	4.6%
8	France	0.2%
9	Greece	0.0%

Total private pension assets in Germany amounted to just 5,2 percent of GDP in 2010, far less than many other European countries. However, three countries, France, Italy and Greece are doing far worse than Germany.

Ageing population

Demographic structure and changes influence economic performance, but the causality can also take the opposite direction. Low income per capita has a strong impact on the fertility rate, due to the inability of parents to cover expenditures related to children. Female participation in the labor force is high which is an additional constraint on the fertility rate. High unemployment and low wages influence emigration to more developed countries, especially of educated and young persons. This has negative impact on labor market structure, human capital and overall economic performance.

Demographic changes in Europe are going toward population aging and increase of share of population aged 65 and more. Ageing population is consequence of falling fertility and lengthening life expectancies, and is expected to continue indefinitely. Population ageing will impose a significant burden on European fiscal balances, in particular through pay-as-you-go pension systems.

[16] OECD, *Pensions at a Glance 2011, Retirement-income Systems in OECD and G20 Countries*, Access at: http://dx.doi.org/10.1787/pension_glance-2011-en

We will consider size of age groups and their growth rates and percentage distribution by age. In Europe age groups of population aged 65 and more and 80 and older will increase rapidly, while other age groups will decline.

Table 3: Population in Broad Range Groups and Change Over period 2000-2300[17]

Europe		Percentage change		
Major Area	Millions, 2000	2000-2050	2050-2100	2100-2300
0-14	127	-26.7	-2.2	-0.2
15-64	493	-26.6	-16.5	0.5
65 and older	107	64.7	-18.0	49.5
80 and older	21	182.8	2.1	106.4

The age group 65 and older will increase in Europe by 64.7% in period from 2000-2050. At the same time, group 80 and older will increase by 182.8%. Similar trends will continue in the future, and will result in increase in percentage share of age group 65 and older in total population in Europe from 14.7% (2000) to 35.4% in 2300.

Table 4: Percentage in different age groups over period from 2000-2300[18]

Major Area	1950	2000	2050	2100	2150	2200	2250	2300
0-14	26.2	17.5	14.8	17.0	16.5	15.9	15.4	14.9
15-64	65.6	67.8	57.3	56.1	55.0	52.8	51.1	49.7
65 and older	8.2	14.7	27.9	26.9	28.5	31.3	33.5	35.4

Similar trends will be seen in dependency. It will influence post – retirement duration in Europe to increase from 9.0 to 14.8 years in respective period.

These data shows that actions to reform public pay-as-you-go pension systems should be taken quickly.

What could be learned from pension reform conducted in Latin America?

Chile was the first country to replace its public pension system with a mandatory individually fully funded scheme. Chile introduced personal retirement accounts that reestablish that essential link between contribution and benefit, between effort and reward and move toward defined-contributions rather than defined-benefits pension systems.

[17] United Nations Department of Economic and Social Affairs/Population Division: *World Population to 2300*
[18] Ibid

The Chilean Pension Savings Account system changes the very notion of what a pension is. Basic elements of the pension system reform introduced in Chile are:

- **Individual capitalization of savings through personal accounts**. Every working man and woman pays its contribution to a Pension Savings Account. Pension Savings Account provides him/her the ability to keep track of how much has accumulated and how well the investment fund has performed.
- **Individual freedom**. Workers choose company which manage his pension assets, and can change freely from one company to another. Workers can choose between various funds with-in one management company. Above certain minimum, they individually decide how much to contribute to their pension account. Chile no longer has a rigid legal retirement age. People can retire whenever they want, as long as they have sufficient savings in their accounts.
- **Private management of the funds**. To manage these growing assets, individuals choose freely among a number of private companies that invest in a diversified, low-risk portfolio of stocks and bonds. Since workers can change freely from one company to another, the companies compete to provide better customer service and lower commissions.
- **Equality**. The same rules apply for every worker, regardless of his position or status.
- **Role of the State**. The management companies are regulated by the government. Supervisory authority monitors how management companies comply with the rules, with investment criteria and how they manage relationship with clients. The government provides also a safety net: the state guarantees a minimum pension if the worker's savings fall short (30 US $ per month).
- **Benefits.** During contributing period each worker is oblige to by insurance. In case of disability or death, insurance company will provide disability or survivorship pension. In case of death, funds that are left over on pension saving account are free disposable and belong to worker's family.

The system has contributed to the phenomenal increase in the country's savings rate, from less than 10% in 1986 to almost 29% in 1996. Since 1981, pension assets in Chile have grown to be around 73 billion US $ and it is near to 75 % of its GDP. [19]

Accumulated pension capital is invested through domestic and foreign capital market in many projects. The average real (above inflation) annual yield on invested pension capital accumulated in period July 1981 to December 2005 was more than 10%.[20]

[19] Jose Pińera, "2nd International Leaders Summit", Zagreb, June 2005
[20] Development of the AFP System, Chilean AFP Association, January 2006

Given these facts, it is no surprise that privatization of pensions began to be perceived as an important ingredient of macroeconomic strength.

Can this system work in Europe?

Adverse demographic changes in Europe will make financial burdens of existing public pay-as-you-go pension systems enormous.

Parametrical changes in existing system could not be a solution to the problem. As European tax and social contribution rates are already high, any further increase may result in sizeable reductions in labor supply. Higher payroll taxes lead to even higher unemployment and thus fewer contributors to the pension system. Furthermore, such an approach could further harm international competitiveness. Significant cuts in benefits, on the other hand, would likely be politically difficult to implement with growing numbers of relatively old voters.

Rising substantially the legal retirement age across Europe is nonviable. Latest evidence from France, when government proposed marginal adjustments in this area for governments' employees and faced strikes, shows the resistance of "welfare state" ideology. Furthermore, rigid European labor laws provide that employee could not get paid less even if his/her productivity is declining.

It is obvious that Europe has to move from public pay-as-you-go pension systems toward a comprehensive retirement system based on ownership, individual freedom, and self-reliance.

The direct link between individual contributions and pension entitlements in a funded system can be expected to reduce the perceived tax burden of current pension systems, thus easing distorting effects on the labor market.

Although people would not be happy with smaller portion of income being at disposal for current spending, and with longer working age, the process of adaptation would start earlier, depending on different preferences. It would not be the result of political battle between different age groups.

Process of political decision making would be put aside by market driven mechanism.

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Has Malthus been right?

Abstract: *Development of economic thought has been marked with dynamic discussion regarding the impact of population numbers on economic growth and development. Many authors, in the context of their lifetime analyzed these two phenomena. They gradually introduced various new impact factors in the analysis. Such factors involved not only the population number and generated economic growth and development (primarily measured by GDP per capita), but also: age structure, mortality and fertility rates, population density, productivity of human capital, technological progress, as well as time dimension in which changes happen (short versus long term). This paper, reviews various economic thoughts starting from Thomas Malthus and his father, as well as Ansley Coale and Edgar Hoover, Julian Simon, Steinmann, Ester Boserup, Allen Kelley and others, adding researches published by international organizations like the World Bank and the United Nations. Finally, authors get back to Malthus stating that his model, even after an entire century and a half; have been adequately flexible and visionary. Strong development of science and technology in the second half of the XX century is mainly focused into the growth of global consumption caused by population number increase, which grows on average one billion every 14 years. Authors conclude that repeated reading of Malthus essays, as well as careful studying of the discussion which marked his time and with drawing conclusions based on similarities with today's time, could help us better understand and better prepare for the future.*

Key Words: *Future of humanity, population growth, economic development, technological progress*

1. Introduction

At the time Christ was born about 220 million people lived on Earth. After 1.500 years this number doubled, while in 1750 reached 700 million. In only eighty years (1930-2011), population numbers increased from two to seven billion.[21] If this trend continues, in 2050 about 10 billion people will inhabit the Earth. Will life on Earth

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[21] Two billion people recorded in 1930, three billion in 1958, four billion in 1974, five billion in 1988, six billion in 1999 and seven billion in 2011

still be possible? Are we going to disappear as a species? Is e large-scale war inevitable in the next twenty years?

Malthus was the first to tackle the question with his thesis that the power of population growth is greater than the power of Earth to meet a man's needs'. Geometric growth of population and arithmetic growth of production would lead to disturbance, i.e. hunger, poverty and increased mortality rate, claimed Malthus. Was he right? Will we find answers in time? At the time when population increased from four to six and half billion the quantity of fish in the Atlantic Ocean decreased from 45.000 to 8.500 metric tons.[22] Does the only salvation for our species lie in conquering other planets as Stephen Hawking predicted? ("There is a risk of total extinction of life on Earth due to consequences of global warming, nuclear war, genetically created viruses... Unless it goes into the space, I think the human race has no future.")[23] How much time do we have to find answers?

The aim of this paper is to present the evolution of ideas, thoughts and researches, which consider not only the quantitative relation between population and economic growth, but also look into the questions of survival of the human race on the planet.

2. Initial Researches

Thomas Malthus started one of the first debates on the relationship between population numbers and economic progress. Even though in the beginning he had no intention of writing an essay, after a series of discussions about the future of mankind with his father, he began to shape up and systematize his thoughts, ideas and arguments in a different way. The letter he planned to send to his good friend, had grown into one of the first systematic works that examines the problem of the relationship between resource and population and one of the most provocative essays written up to this day.[24]

Unlike his father Daniel Malthus[25], who believed the application of science in industry and agriculture, would bring mankind to a *golden era*, his son believed the progress, caused by scientific growth, would be overpowered by population growth. Thomas Malthus believed the conditions the poorest lived in would remain unchanged regardless of technological progress, while in the long run, population numbers would depend on two factors: available food and mortality rate.

[22] Source: *International Commission for the Conversation of Atlantic Tunas.*
[23] Stephen Hawking: *Space Exploration Crucial To Human Survival;* The Huftington Post, 18.11.2011.
[24] Thomas Malthus, *An Essay on the Principle of Population* (1798).
[25] Daniel Malthus was a contemporary and friend of the philosophers Henry Rousseau, David Hum and William Godwin.

One century later, empirical evidence showed that exactly those regions Thomas Malthus analyzed in his essays, due to technical progress, achieved surplus rather than lack of food and at the same time a significant increase in population. Logical conclusion would be that his ideas were lacking an analytic and empirical basis. Is it really so?

The statistical basis for this research was data referring to the USA, where the population, in the period of 150 years, had doubled every 25 years. Malthus used this to emphasize that the progress in agriculture that could support this trend was impossible. He assumed it would be possible to double the agricultural product production in England in the first 25 years, but it was hard to imagine that it could be doubled in the next 25.

Besides USA, Malthus studied the case of Norway as well. At that time[26], Norway had the lowest mortality rate - 1 out of 48 persons died every year. For the sake of comparison, in London this ratio was 1 to 20. In addition to low mortality rate, marriage rate was low as well – 1 marriage in 130 inhabitants. The reason for such low marriage numbers was 10-year mandatory military service, during which marriage was not allowed. There were a lot of people who got married only after 40. Moreover, priests did not marry couples that had no economic ability to support family. Landowners controlled arable land and employed the workforce, and as a rule had several small houses on their estates where employed married couples lived. Only after one of those houses was free other servants were allowed to marry. As the mortality rate was low, there was small chance for employed servants to marry. Practically, the low mortality rate in Norway brought about a low marriage rate, and consequently low birth rate. This is how the balance of total population numbers has been controlled.

Malthus published a revised edition of his essays in 1803 where he defined *preventive* and *positive* measures to influence population growth. Preventive measures mostly included birth control, while positive measures referred to mortality increase (hard work, extreme poverty, diseases, epidemics, wars, etc.). Thus, Malthus was the first to notice causality not only between population and poverty but also between population and wars. Arguments to support positive measures came from the experience he gathered from different parts of the world. For example: the case of American Indians, or the case of New Zealanders, who justified cannibalism and wars to prevent population growth. Examples from the Middle East and Asia also supported his main thesis, for in this area wars have been started when the number of inhabitants exceeded the food supply. Malthus also described the case of Germanic tribes, where the increase of inhabitants influenced

[26] Malthus was in Norway during 1799.

the increase in the number of wars and conquests and brought about the destruction of the Roman Empire.

Obsession with population growth and its influence on economic development, has contributed to the forming of different opinions regarding food imports in relation to other known economists at that time. Namely, the lack of food in England influenced the increase of cereal prices. However, the import of cheaper cereals was prevented by adoption of the *Corn Law*. Landowners, who practically controlled Parliament, proposed the Law. Factory owners were against adoption of this law. They wanted to provide cheaper food for their workers. Malthus took the side of landowners, proving that England would become import- dependent, which over time would have brought uncertainty. David Ricardo, for example, took the industrialists' side. When the industrialists took over control of Parliament, they suspended the Corn Law and enabled the import of cereals, which significantly reduced food costs to factory workers. It proved that Malthus was right – the fast-growing population of England became dependent on cereal import.

Malthus observed the relationship between population and development through the prism of ideas of utopian socialism, which were in full swing at the time. He believed that equality, as represented by Condorcet and Godwin[27], was impossible, for the simple reason that it would increase consumption of existing food reserves. Even Condorcet himself noticed that the improvement of living standards of the poor would actually bring about rapid population growth. Malthus believed that different classes of society had different roles in maintaining mankind and that, for the same reason, equality among classes was not possible. He thought that happiness was more placed in middle class society, rather than in its extremes, thus the number of rich and poor should be lower than the number of those belonging to the middle class. He advocated the universal education of all classes. For his good argumentation and analysis, Malthus was designated as the biggest opponent of utopian ideas.

His ideas were forgotten for a century and a half. In the middle of XX century mortality rate considerably decreased in a large number of countries.[28] With birth rate increase, population had started to grow too. The question whether population growth would impact economic wealth and future development again had gained in importance. Malthus' model was considered suitable for the period prior to the

[27] Philosophers, friends and contemporaries of Thomas Malthus' father

[28] In largest part of history, life expectancy was short (from 25 years at the time of our ancestors to 35 years, which was average life expectancy, for example in England, in 1700). During XVIII century, average life expectancy extended to 41 year (1820), in XIX century reached 50 years, while today it reached 78 years. Decrease of mortality rate had particularly been expressed at younger population. Explanation can be found in finding cures for many infections that used to be fatal.

industrial revolution. Even though certain authors supported his model, they emphasized that the economy of XX century greatly differs from the one in Malthus' time.

3. Researches between 50's and 70's of XX Century

The United Nations published a study[29] in 1953, which implied the connection between economic development and population. There were 21 economic and demographic factors analyzed in the study. It showed that the impact of population growth to certain economic factors was positive (economy of scale and organization), on certain factors it was negative (lower yields), while on some it had had no impact at all (technology and social progress).

Five years later, Ansley Coale and Edgar Hoover published research results that referred to under developed countries.[30] Based on a mathematic model, authors concluded that the economic development of India would be significantly faster if the population growth rates were lower. The analysis was based on two hypotheses: (1) total saving would disappear in time due to the growth of the number of families and (2) total investments, compelled by sensitive social costs, instead of relatively productive, would be directed towards unproductive sectors (first of all health care and education). Unlike Malthus, who in his research was focused on arable land, Coale and Hoover took overall physical capital into consideration.

Over time, economic theory and data obtained through more and more comprehensive statistical researches had indicated the importance of human capital productivity and technological changes. However, both above mentioned factors have not been included in the study by Coale and Hoover. Additionally, data could neither confirm the hypothesis on decrease or disappearance of savings in underdeveloped countries despite high population growth rates nor could it offer empirical evidence of an increase of investments in education, even in the period of significant increase of pupils and students. Despite all that, the study by Coale and Hoover had not only a pioneering importance, but it also brought out, though in modified form, the dilemma Malthus had – whether human kind by its reproduction endangers only itself?

USA's National Academy of Science in 1971 published systematic collection of texts entitled: *Rapid Population Growth: Consequences and Implications on*

[29] United Nations, *The Determinants and Consequences of Population Trends* (1953).
[30] Ansley J. Coale and Edgar Hoover, *Population Growth and Economic Development in Low-Income Countries* (1958)

policies.[31] There was a significant dispute among authors about effects of population growth in the short and long term. Direct, short-term effects of demographic changes are almost always reduced, and sometimes even completely neutralized by the long-term effects.

In 1973, the United Nations updated estimates from the study published 10 years ago. In case population growth continues, the future of mankind was looked at with less optimism. Two questions were dominant: (1) How to feed the growing population (which meant returning to Malthus' traditional dilemma) and (2) to what extent net accumulation of capital maybe resistant to demographic pressure (which intensified concerns of Coale and Hoover)?

The Study showed differences in time dimensions, highlighting that, in the long run, effects of prices change, innovations and institutional changes should be taken into consideration as well. However, analysis based on mere correlation could not prove the negative impact of population growth on GDP *per capita*.

4. Researches during 80's of XX Century

During the 80's debate over the relationship between population and economic progress was continued. Julian Simon published in 1981 a paper entitled *The Last Resource*[32]. It returned optimism in the belief that there is no negative relationship between demographic and economic variables. Simon focused not only on population and age structure, but also on current size and density of population. The role of technology, as the most important factor of economic development, has been particularly emphasized. It is possible that large number of graphs illustrating the thesis that prices of natural resources would go down in the long term, regardless of the growth of demand caused by population growth, have contributed to the popularity of his work. He believed this was possible due to technological achievements.

Simon in cooperation with Steinmann made a model of economic growth, whose main idea was that higher population and higher level of technological growth contributed to higher income *per capita*. Development of technological processes does not actually depend on population. Even if the population remained the same, technological progress would be achieved. The function of technological progress was added to the Cobb-Douglas function of production in order to create a model in which technological progress would be used as an endogenous variable based on population growth. The population was equal to the workforce, which actually

[31] National Academy of Science, *Rapid Population Growth: Consequences and Policy Implications*, (1971)
[32] Julian L. Simon's, *The Ultimate Resource* (1981)

meant that the problem of age structure had not been considered. Additionally, the influence on savings was neglected. Japan and USA were taken as examples. The result of the model was moderate economic growth of income *per capita* in the point of balance. Simon concluded that the maximum long-term rate of economic growth requires growth of population and savings at an annual rate of 1-2% and 2-4% respectively.

The role of technological progress was especially emphasized in the area of agriculture. Simon improved the model Ester Biserup designed in 1965.[33] Namely, Boserup in her work, entitled *Conditions for Agriculture Development* stated that the productivity increase was caused by technological progress, economically sustainable only in areas with high population density, thus the pressure of population growth on results of agricultural production would have a positive effect. Simon extended this thesis with analysis that showed population growth had a positive effect on a larger number of social projects, such as construction of new roads, irrigation systems or communications.

The *World Development Report*[34] from 1984 published by the World Bank expressed concern over future development of countries with population growth over 2%[35]. Simultaneously, conclusions of the study were that population growth may slow down economic development only under certain circumstances and have a restrictive effect.[36]

The National research Council[37] in 1986 formed a working group consisting mostly of economists, who were dealing with issues of population growth and economic development. The working group came to the qualitative conclusion that in the majority of countries slower population growth would impact on faster economic development.[38] The report highlights individual and institutional answers to population changes. It confirmed that developing countries, despite population increase: (1) have neither experienced significant changes in total savings (2) nor have investments been significantly directed towards unproductive sectors (education and health care), in the first case due to the fact that unit costs per pupil/student reduced, while on the other side, efficiency increased. In addition, direct connection between population growth and decrease of total revenues has not been confirmed.

[33] Ester Boserup, *The Conditions of Agricultural Growth* (1965)
[34] The World Bank, *World Development Report*, 1984.
[35] Ibid, page 79.
[36] Ibid, page 529.
[37] National Research Council, The Working Group on Population Growth and Economic Development, (1986)
[38] Ibid, page 90.

The report highlighted the importance of renewable resources and that the problem was not in the population per se, but in institutional error. A decrease in population of 50% would not solve the problem, but only postpone it. The solution was not in decrease of demographic pressures, but in policies that would be focused on reasons for errors, i.e. more effective property rights, market approach and state policies that would correct externalities.

Even though there are countries with no influence of population growth to economic development, and even those where economic development is in positive correlation with population increase, Allen Kelley[39] in his research published in 1988, thought that economic development would be faster if population growth was slower. Also, Kelley came to the conclusion that the population growth would have more negative effects on economic development in countries where: (1) arable land and water supply were limited; (2) property rights were insufficiently protected (3) and government policies inefficient.

The consensus of numerous researches more or less showed that demographic changes have no strong effects on economic development. It was noted that: (1) changes were greater in the short rather than in the long-term; (2) it was necessary to study the influence of specific demographic components (size of population, population density, age structure, birth and mortality rate, etc.); (3) and that qualitative researches must be replaced with quantitative ones.

5. New Paradigm

Unlike statistical data during the 60s and 70s, which claimed negative correlation between population growth and economic development, data from the 70s and 80s confirmed positive correlation.[40] Qualitative researches and assessments had grown into quantitative ones. Robert Barro[41] published one of the first researches, which included economic, political, social, institutional and geographic determinants and their influence to long-term income *per capita*. Barro showed the influence of fertility rate to long-term economic development.

In the Study published in 1998, Bloom and Williamson[42] highlighted that there was a significant influence of aging changes, mortality and fertility rates to economic

[39] Allen Kelley, *Economic Consequences of Population Change in the Third World*, Journal of Economic Literature 1988.
[40] For more detail see the research by Kelley and Schmidt, 1994.
[41] 1997.
[42] Bloom D.E., Williamson J.G., *Demographic Transitions and Economic Miracles in Emerging Asia*, World Bank Economic Review, 1998.

development. Empirical results, which include East Asia, indicated lower fertility rates in the short term.

In the end, Kelley and Schiumdt[43] compared previous models and came to empirical evidences, which say that in a large number of countries demographic changes influenced up to 20% of income *per capita* in the period 1960-1995. This means that population has influence on economic development, and this influence has changed during the period of the last 35 years. The influence of certain economic variables is positive in the long term, but differs from one country to another. In the short and mid-term, during the period of demographic and economic transition, the influence of population on institutions (state policy, market efficiency, property rights, etc.) was not significant.

6. Again Malthus

Despite significant progress in the last century and a half, the issues of poverty, shortage, diseases and war are still ongoing. Technological advancement has led to the development of means of mass destruction. A sudden rise in population gave a new dimension to the problems of poverty and hunger. In many developing countries, poverty and disease remained the main problems. In industrialized countries, only a small percentage of the population worked in agriculture, while the majority was focused on other sectors of the economy. Scandinavia is the area where poverty and wars were at least locally eliminated, and where death from infectious diseases was rare. All of this would not be possible without low birth rates.

Does this mean that Malthus was right for certain regions and wrong for some others? We can conclude that his model was flexible enough. In countries with low birth rates and a stable population, so called preventive measures were in force, while in countries with high birth rates, it is necessary to consider so called positive measures. Also, Malthus would explain the previous global population growth with growing productivity in food production in developed countries.

And indeed, during XX century strong productivity growth in agriculture was achieved, first of all, thanks to the so called *green revolution*. Between 1950 and 1984 cereal production increased about 250%. This contributed to population growth. David Pimentel[44] and Mario Giampietro[45] pointed out in their study published under the title: *Food, Land, Population and Economy of USA*[46] that in

[43] Kelley A.C., Schmidt R.M., *Economic and Demographic Change: A Synthesis of Models, Findings and Perspectives*, Oxford University Press, Oxford, 2000.
[44] Professor of ecology and agriculture at Cornell University
[45] Senior researches in National Research Institute on Food and Nutrition (INRAN)
[46] *Food, Land, Population and the U.S. Economy*

order to have a sustainable economy the maximum population in the USA must be - 200 million. The Study shows that the USA must reduce its population by at least one third, while the world population must decrease by two thirds in order to achieve sustainable development. At the same time, authors of the study believed that a crisis in agricultural production may be expected after 2020. On the other side, Dale Allen Pfeiffer believed that we were soon to be faced with such exponential growth of food prices the world has never seen before. The anchorage for its thoughts he found in the fact that we are approaching the point where almost the entire loss of annual harvests was possible due to genetically modified pests.

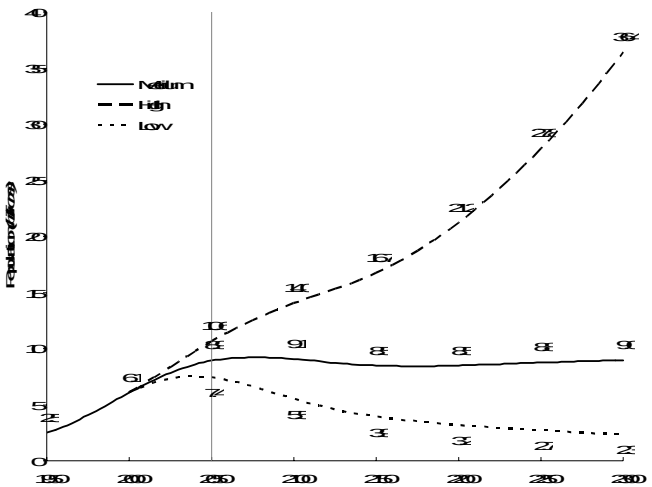
If today's economy would function on the same principles as the economy before, one question demands an answer. Do modern models of growth properly demonstrate not only population and economic trends, but also a mechanism based on which the growth is achieved? There is a great possibility that they do not. Simon believed that geographic anomalies had no effect on short-term economic trends, but in the long term they did. The influence of population growth and especially population aging has different effect on total savings in developing and developed countries.

There are numerous indicators showing that population numbers and the overall world economy are approaching their limits. For example, a recently published study by Vitousek, Ehrlich and Matsen showed that 40% of net production of primary photosynthesis[47] directly or indirectly is used for human needs. The study points to the loss of biodiversity. Namely, it was estimated that there are between 5 and 30 million different organisms living on Earth, out of which only 1.4 million has been studied. Between 50% and 90% of all organisms live in tropical forests, which considerably decrease every year[48]. We still have no knowledge what consequences inevitable extinction of unstudied species would have on human life.

Is it possible to produce enough food with current knowledge and technology? Provided that 1.5 billion hectares is farmed (which is approximately equal to today's arable land surface) and achieve yields of 5 T/ha (currently 2 T/ha), it would produce about eight billion tons cereals. How many people can be fed with this production? Depending on the number of calories, between 11 billion (if the daily intake is 6.000 calories) and 7.5 billion people can be fed (if daily intake is 9.000 calories). There is almost no doubt that a significant adaptation to new diet regime is ahead of us (Graph 1).

[47] Net primary production of photosynthesis is defined as the light energy captured from the sun and converted into chemical energy by plants, reduced for energy plants use for their own metabolism.
[48] About 55% of tropical forests have already been destroyed. Additional surface equivalent to the size of Switzerland is destroyed every year.

An additional problem is the use of fertilisers and irrigation. According to research conducted by MIT, 34% food production increase in the world, recorded in the period 1951-1966, required a 146% fertile consumption increase and a 300% pesticide consumption increase. In the period 1964-1987 fertile use in Asia had increased 10 times.[49] In order to provide productivity growth, it would be necessary to increase fertile consumption. Having regard to long-term side effects of fertile use, especially non-organic ones, productivity growth in agriculture is limited.



Graph 1. Population number from 1950 and projection until 2030 with respect to three different growth scenarios[50]

Conclusion

This paper draws attention to the fact that due to population increase there is a danger of human race self-destruction. To stabilize and gradually decrease the population numbers is neither an easy task nor is it possible without grave/serious consequences. For example, how to solve a decrease in population and an aging of population running parallel? Or, what effect on social, health and retirement systems would possible solutions have around the world?

In the period 1967-97 global data shows different results. Income *per capita* has increased. This, at first sight, brings the Mathus' theory into question. However, data did not confirm Simon's theory either. In the short term, salaries were minimally affected by a sudden population rise (Friedberg and Hunt, 1995). Also, data shows that in total population growth, the highest influence was with population aged between 20-50, which suggests that increase of workforce supply has to a greater

[49] Increase from 4 to 40 million metric tons.
[50] The United Nations, *World Population to 2300*.

extent been caused by migration rather than natural birth. This further suggests that there is a complex, not a simple connection, between population growth and saving rate.

Low birth and mortality rates, stable population, high level of education, control of infectious diseases, women` equality, democratic governments, eliminating poverty and wars, are factors that influenced limited population growth in developed countries. Contrary to that, many third world countries were characterized by overpopulation, polluted air and water, high population density, high unemployment rates, high poverty and crime rates and numerous ethnical conflicts.

If Malthus were alive today, what would he say? The population numbers would certainly surprise him, especially during the XX century. However, it remains a big question whether or not he would have modified his theses. It is much more likely he would highlight that we have reached the point in human history, which defined future of the life on Earth; in case the total population is not stable and decreased, environmental consequences could be catastrophic and the lack of food inevitable. It is possible that he might advocate strict family planning, as an alternative measure to natural selection, poverty, diseases and wars. In his works, Malthus highlights that population growth pressure[51] is one of the main reasons for wars. Since wars are one method of decreasing population pressure and to bring the food demand and supply into balance, then the way to achieve this and avoid wars is the stabilization of population.

Strong development of science and technology in the second half of the XX century was mostly directed towards global consumption caused by population growth, which increased by one billion every 14 years. One thing is certain – population on Earth cannot increase either indefinitely or by the dynamics that marked the last 100 years during which two world wars occurred. The next phase of the battle between overall progress and quality of life will mark the availability of resources. By re-reading of Malthus' essays, careful studying of discussion that marked Malthus' time and drawing parallels with today's time, we can better comprehend and prepare for the future.

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Healthcare system and demographic development

Abstract : *Health economists explain individual behavior as a process in which an individual makes decisions by comparing his current health condition, time, and financial costs on one side with future health history such as decrease of the probability of a disease or death, on the other side. Even though genetic predispositions and risks associated with environment in which an individual lives have a nontrivial impact on the overall health condition, his behavior is usually the single most important determinant of his health condition. By aggregating individual behaviors on micro level, we come to the macro level, i.e. system and regulations, which determines the environment in which the individuals make their decisions, limiting their choice set. That is why it is very important to connect these two levels when analyzing healthcare system from the cost minimization point of view, which is very important in times when population is both growing and ageing making significant pressure on healthcare system.*

Keywords: *healthcare system sustainability, individual behavior, health production, health factors.*

Introduction

Healthcare system is area, which in almost all countries constitutes a significant share of gross domestic product (GDP). Therefore, demographic changes initialized discussions about healthcare systems in countries around the World.
In this paper, we analyze the relationship between the population growth and the costs of the healthcare system. In fact, we investigate how individual can decrease costs of healthcare system and furthermore contribute not only to the development of the healthcare system but also to the development of the economy as a whole. We show that if all individuals were behaving as entrepreneurs, the costs of healthcare could be considerably decreased which would in turn lead to the sustainability of the healthcare system despite the population growth.

We are witnesses that issue of the healthcare system sustainability goes beyond professional circles, and has even become a subject of everyday-life debates. Reform of the entire healthcare system and ensuring its functioning in terms of social and economic development and potential of the country is crucial. However, in this paper we do not want to talk about macro level and changes that should be made on the institutional level but about micro level and things that each individual can do in

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order to achieve a goal that we all stream to and it is to add years to life, and even more important, add life to years.

1. Individual as producer of his own health

Even though genetic predispositions and the risks associated with the environment in which an individual lives have a nontrivial impact on the overall health condition, his behavior is usually the single most important determinant of his health condition. Behavior of an individual, along with the adjustments he makes to it due to the changes in social environment and incentives he faces, has a significant long-run impact on his behavior.

As the saying goes, "Health is not everything, but life is nothing without health." This saying points out to two very important health features, such as:

Health is a very valuable asset: Sometimes it goes so far as to say that health is the only thing that matters in life. That is, the first part of the saying reminds us that there are other values and goals, but comparing to health, most people rank them in a lower place.

Health is a prerequisite for other activities: The second part of the saying indicates that the existence of health represents a condition for performance of many other activities. Poor health limits productive capacity of a sick individual, including his ability to enjoy good things.

However, here we will give consideration to something that is not mentioned in the saying, which is that health can be produced. Until recently, it was believed that good health is a "gift from heaven", and that poor health is a bad luck. The success of modern medicine is precisely the conviction that most people can achieve good health if they follow the appropriate instructions and treatments. Furthermore, when we say that health can be produced, that immediately raises the question of who is the producer. Although most treatments are attributed to doctors, one cannot deny the fact that each treatment begins in the psyche and the body of a sick individual. Also, the fact that most diseases heal spontaneously is supported by the view that the individual is the final producer of his health.

The term health producer or health production must not cover the fact that an individual (with or without the help of a doctor) can only affect his health, but cannot fully determine it. In addition to hereditary and environmental factors,

accidental events can always annul the efforts of an individual to maintain good health. Therefore, many unexpected changes can occur at any time.

Accordingly, we will consider health as a capital asset. The greater the amount of capital assets is, the greater is the production of goods and services which can be used as an investment for more goods and services.

Questions posed are:

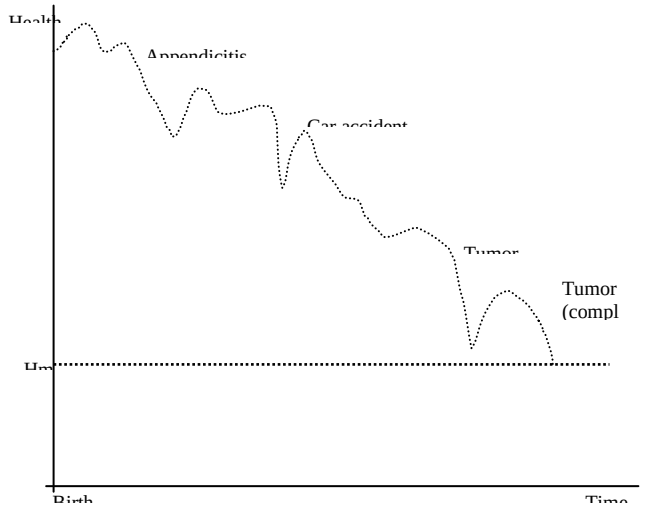
- From the standpoint of an individual, which is the optimal allocation of resources between health and other assets?
- Can frequently changeable behavior (opposing to health when we are in good health, and sacrificing everything for the benefit of health when we are sick) be placed in the line with rational behavior? Or, are individuals' preferences inconsistent, implying that health experts should determine the amount of preventive measures?
- Can economic concept of substitution be applied in the health production?

2. Health and Life Cycle[52]

Like any other durable goods, our health fund is spent over time. We call this aging process. When our health fund becomes very small, we lose the ability to function, and, eventually, die. Expressed in economic terms, we say that our health fund loses value. "Normal aging" in a society represents the average rate at which this fund loses value, but we should bear in mind that there is nothing substantially biological in this process. Life expectancy has increased, for example, due to decrease of a value of the human health fund over time. The efforts of public health care (such as: sanitation, vaccination against infectious diseases, etc..) and individual health care also contribute to a reduction of the rate of decrease in a value of a health fund, and restore health to the same or nearly the same level like it was before the illness or injury. So, if we graphically represent a health fund of a typical representative of a society, it would look as in Graph 1:

[52] In this section we have used: Phelps Charles, 2004, "Health Economics", Addison Wesley and Folland S., Goodman A.C., Stano M., 1993, "The Economics of Health and Health Care", Prentice Hall

1.1.1.1.5.1 Graph 1. Timeline of the health fund



We see that the line representing the health fund has a stable rising path during the childhood. The line then gradually decreases due to aging process, being intermittent due to illness and injuries. At the critical level of a health fund (Hmin), the person dies. It can be clearly seen on the graph that medical care plays a significant role in the process of restoring health due to occurrence of diseases or injuries, unless the minimum level of health has not been reached (Hmin). For example, after appendicitis attack, the line would have a dramatic fall up to the minimum level of health, i.e. death, in case that medical intervention has not been undertaken. Moreover, the following table shows the mortality rate in certain age groups in Montenegro, from which it can clearly be seen that health fund rapidly decreases with aging.

1.1.1.1.5.2 Table 2. Mortality rates by age groups (Montenegro)

	Number of deaths	
Age	1990	2010
1-4	16	12
5-14	22	15
15-24	62	54
25-34	96	82
35-44	183	149
45-54	310	466
55-64	678	784
65-74	651	1589
75-84	1095	1891
Over 85	623	527

2.1 Lifestyle and Health

In addition to these "random" events described above (injuries, illness), many other things that we consume and do in our lives affect the aging rate (slope of the line in the graph 1) and the number of "spikes" on the same graph. Our lifestyle greatly contributes to our health. The content of a set of products and services we use (X) may differ from person to person and consist of different goods that may significantly increase or significantly reduce the health fund. The latest medical research shows that the old saying, "You are what you eat", is at least partially correct. Perhaps even more correct is the quote from the Bible: "As you sow so shall you reap". Distinctive among these choices are: decisions on the consumption of the alcohol, tobacco, drug use (both legal and illegal); diet composition; the nature of sexual activities; frequency of exercise. This is precisely the problem: many things that bring us satisfaction (and which are part of our set X), cause the reduction of our health fund (H), i.e. life shortening. Therefore, not only are X and H substitutes to each other in the production of utility, but also X affects H in terms of production. Let's now go further and separate elements that form X according to their impact on the health fund. There are "good" X types (X_g) that increase the health fund, and "bad" X types (Xb) that reduce the health fund. For example, good assets would be physical exercise and eating vegetables, and bad ones alcohol consumption and consumption of food high in cholesterol. There are also neutral assets, such as, for example, reading a book, that will not have a direct impact on health, except possible increase or decrease in peacefulness of a relevant individual. Now we can extend the previously defined production function, disassembling the set X into good and bad elements. Now, the production function will take the following form (signs above certain elements show whether this element has a positive or negative impact on health fund):

$$H = g(\overset{-}{X}_B, \overset{+}{X}_G, \overset{+}{m})$$

It would be absolutely crazy to say that people should not consume goods and services from a subset XB. The goal of a rational individual is to maximize his usefulness within the limits of budget constraints, and these goods undoubtedly increase usefulness. However, we should know the effects that these choices have on health. In many ways, these behavioral choices have much more influence on health of an individual than to the health system.

3. Environment and Health

One of the first works that illustrated the impact of lifestyle and environment is the work of Barbara Wolfe[53]. She researched trends of the health status in several industrialized countries. She observed expenditures for health care in these countries, as well as factors that reflect the lifestyle, such as the use of cigarettes and alcohol. Previously done international studies have shown that either there is no influence of health expenditures, or it is very little, but when she controlled the lifestyle, she found a positive relationship between health care and health in these countries. Later works, as for example is the work of Hitiris and Posnett[54], confirmed and extended this finding. They found that countries with better health care also have healthy citizens. However, the question to which we would pay attention here is what about the lifestyle and environment, whose significance is indirectly found here? Haven't we always known that the large part of our health depends on our own choices, i.e. decisions?

We have already emphasized the importance of the lifestyle, and here we would briefly mention the results of a study that shows the importance of the environment, that is the impact of environment on the health of citizens. This research was done by Victor Fuchs[55], who observed the American states of similar size, development, and expenses for medical care. It turned out that in countries with better climate and healthier lifestyle of citizens, the death rate, which measures the health of the population, has been less.

4. Health Production Today and the Role of Education

When it comes to the production of health today, one should start from two basic questions. First: How to measure health? And the second: How to eliminate bias in estimations?

It would be desirable to have some measure of health of population which will have at least two characteristics: it must encompass all aspects of health that are of importance to us, and must be measured with certain precision. However, it is very difficult to achieve both objectives. The most reliable are data on mortality rates. Yet mortality rates do not include several significant aspects of health, such as reduction

[53] Wolfe Barbara, » Health Status and Medical Expenditures: Is there a Link?«, Social Science and Medicine, issue 22, 1986.
[54] Hitiris T, Posnett J. "The *Determinants* and Effects of *Health* Expenditure in developed countires", *Journal of Health Economics, broj 11*, 1992.
[55] Research was published within the book: Fuchs Victor, »Who shall live?«, World Scientific Publishing, 1998.

of pain and suffering and other improvements of the quality of life. Nevertheless, primarily because of their accuracy, it is understandable why they were previously used. In addition to these rates, the rates of morbidity and days of incapacity for work were also used.

Conceptually, statistical evaluations should be built on the basis of all available health inputs and the resulting outputs. Data obtained by the research described in the previous section are an example of such data. These data, combined with adequate econometric methods, would allow direct and precise estimation of production function, which is the final goal of this research. Unfortunately, real data usually allow only indirect estimation. Researchers have often used the availability of some health inputs in the population, not amounts of inputs that are actually used.

However, up to this day, a method of research has been significantly improved, and this progress includes an emphasis on direct and unbiased estimations of production function. The issue that may cause bias is easily explained by an example. Suppose we have information about one health input, such as the number of doctors per capita, but we lack data on some other input, such as how much time do the local people devote to exercise. For econometricians, these two variables may be linked: in areas where residents spend less time exercising, you may need more doctors. If we are not aware of this correlation, or if we simply do not have these data, then estimation of the efficiency of doctor may be underestimated. What is laudable is that contemporary literature[56] has significantly advanced in elimination of these biases.

4.1 The Role of Education

First of all, the question is what is education. Education includes all of what we learn, read and hear, both privately and in formal institutions. Given that certain parts of education are impossible to be precisely measured, economists in the health sector are concentrated on education, i.e. a formal education. Several studies have shown that the health status is correlated with education. If the marginal product of education is very small (i.e., we are on the flat part of the production function), then it would be logical to reduce public expenditures for health at the margin, and redirect those funds to education. However, correctness of this logic depends on which of *two theories on the role of education* is right.

[56] For example: Wagstaff, A. "Econometric studies in health economics", Journal of Health Economics 8: 1-51. i Theodossiou, I., "The effects of low-pay and unemployment on psychological well-being: a logistic regression approach", Journal of Health Economics 17: 85-104, 1998.

The creator of the first theory is Michael Grossman[57], whose theory of demand gives the central role to education. According to him, better educated people are economically more efficient producers of health. Better educated people understand the technology or have knowledge of how to stay healthy. They also know better how to use medicines and other market inputs, as well as their own time in order to produce health. In this view, the marginal transfer of resources represents a good idea.

Other economists have put forward the hypothesis according to which the education and health status are correlated only because both are correlated with one or more other factors. The problem can be seen as the well-known problem of self-selection. Do the people who choose higher levels of education have unobserved characteristic that makes them likely to be healthier?

Victor Fuchs[58] proposed a theory that serves as an example and includes certain macroeconomic aspects of temporal discounting. Consider an individual who faces the possibility to invest in education. Considering that education requires instant costs in order to achieve some benefits in the future, people with relatively low discount rate will invest in education. Similarly, health investment requires significant ongoing costs for return in the distant future. For example, payments may be delayed for the last years of life. This means that individuals with low discount rates or big time horizon will seek to invest in education and health. This will cause correlation between education and health, though the additional investments in education will not cause improvement of health.

Conclusion

The demand for healthcare is derived from individual's need for better health. Howevewer, access to healthcare system is only one of many ways of improving health. In fact, the marginal product of healthcare is relatively small compared to the marginal products of all other factors. That is, the living conditions, lifestyle, and genetics largely affect health of an individual.

Is the investment in education or in healtcare ultimately better for the quality of health? The answer to this question depends on which of the following two theories is correct: one theory which claims that better education improves the ability of an individual to produce health, or the other theory that claims that individuals choose both education and health for some other reasons. Understanding the process of

[57] Grossman Michael, " The *Human Capital* Model of the *Demand* for Health«, NBER, 1999
[58] Fuchs Victor,1999, »Future of health economics«, NBER

health production will undoubtedly stimulate future research, both theoretical and empirical.

Finally, we have to understand that we cannot expect the government to solve our problems. Also, we cannot make someone else responsible for the choices we make. When it comes to health, each individual should behave as a responsible entrepreneur who makes best decisions regarding his health. In turn, if everyone behaves responsibly the healthcare costs will decrease considerably.

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Demographic trends, pension reform and labor market in Montenegro

Abstract: *Pension systems and process of pension reforms have direct influence on labor market in all countries, no matter for their political or economic status. Evidence shows that pension reforms have similar patterns in different countries. One of the most significant features of this process is positive influence of pension reforms on the labor market - reduction of pension contribution rates gives incentives for employment growth. This paper confirms previously stated through analytical overview on the relation of demographic trends, pension reforms and labor market in Montenegro in last decade.*

Key words*: pension system, employment, demographic trends, contribution rate for pension insurance*

1. Introduction

Analysis of demographic trends at the global level shows the trend of ageing society, which is also present in Montenegro. During the second half of twenty century Montenegro was influence by strong process of demographic transition. It used to be country with high rate birthrates, high rates of mortality and natural accretion, with high growth of total population, with young population structure, with high external and internal migration and with equally distributed population. Montenegro is transformed in the country with low increase of population, low birthrates and low rates of natural accretion, with increase in mortality rate, low rates of external migration, the more conflict population arrangement and increased urbanization, which has long run tendency.

Extension of lifetime and ageing society is very important factor of economic development in global world, but also in Montenegro. This is because ageing society from one side increases market of the products for older, and at the other side increases expenditures for older population. At the same time, ageing society causes

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potential problem of the deficit of working force in Montenegro and demands intensive reforms of pension system and shift for intergeneration solidarity to capitalized pension system. The need for reform of pension system additionally is enforced by not developed financial market and non flexible labor market, and defining the priorities in this area should be started precisely from these two elements.

Analysis of the influence of demographic trends on pension system reform, labor market and system of social protection is very popular in economic research in last decades. This topic is especially attractive in the counties of Europe and North America, where evidentially ageing society endangers sustainability of pension system, system of social protection and healthcare, but at the same time makes important change of the structure of the supply and demand at the labor market. Almost every current important economic theoretician has at least one part of its work regarding this current megatrend. (Non) sustainability of pension system is subject of the attention of all national governments, but also international institutions.

2. Pension reform in Montenegro

Transition of planning to market system introduced number of changes in all areas of economy. The need for the reform of pension system is caused by implementation of pension system that was based on institution framework of social insurance, which gives advantage to current generation comparing to future generation of retired persons. That caused debt of state pension fund, which is financial crisis of pension system. Therefore, the need for the creation of new pension system in Montenegro that should solve the problem of implicit pension debt, the need for the creation of the pension system according to internationally verified schemes and encouraging of the development of financial market, are obvious and those should lead to better performances of labor market. The most important determinants in the functioning of pension system are demographic trends and economic structure. That causes two risks from which depends sustainability of the system: political risk, which creates atmosphere but also affects economic development and dependence of political decision. The other risk relates to demographic risk and demographic trends.

Pension system in Montenegro is based on the model of intergenerational solidarity-that is called PAYGO system, which is system of current financing. In PAYGO system pension for the currently retired persons are paid from the taxes that currently employed persons pay to state. In other words, retired persons have guaranties of the passions on the basis of taxes that are paid by current and future generations of employed persons. That system takes into account long-term period

and there is no direct relationship between paid taxes and received pension (system of defined taxes).

System of pension and invalid insurance, during previous decades, was used as a modality thought which numerous of society problems were solved, starting from unemployment, liquidation and transition. One of the characteristics of the system is age limit for the leave in retirement which was not changed, despite the prolongation of the expected lifetime, decrease of the importance of physical work and change of the structure of economy. In Montenegro age limit was very low and it provided retirement to men with age 60, women age 55 and with 20 years of working period for "pension life". Besides that, retired people had many rights which were not based on the paid taxes and that did not depend on length of working period, which additionally endangered financial stability. All this lead to important non stabilities on the labor market, because there were no incentives for workers to work more, and therefore to have higher income for pension insurance thought contributions.

One of the weaknesses of the PAYGO system can be visible since its use causes high transfers between deferent population groups. Non fair redistribution and high participation of the costs for pension into to gross domestic product slows down the economic development, not only in Montenegro. Transition process have worsen the situation on the labor market through decrease of the number of employed persons that will pay taxes and increases number of retired persons, and it caused need for the pension reform. As most important determinants in the functioning of such pension system are demographic trends and economic structure.

Current pension reforms in Montenegro are based on the three pillar model of pension system. The pillar of the pension system presents independent way of financing pension. Therefore, three pillars in one pension system present tri possible sources for financing pensions, first pillar- current financing, second pillar- cumulative, capitalized financing and third pillar- voluntary pension savings. Pension reforms in Montenegro introduced third pillar, while introduction of second pillar have not started.

First steps toward change of pension system of Montenegro started in nineties years in previous centuries. Concrete steps were taken in 2001[59] when it was started with the discussions about model of more pillar pensions system. In that 2001 year more than half of the expenditures for the pension bellow the age limit (invalid pensions and family pensions). That means that 47.8% of total expenditures for pensions or 35.4% of total costs of Fond for pension and invalid insurance (Fund PIO) were used for the retried people above the age limit. That situation and trend that exists in

[59] Law on pension and invalid insurance (Zakon o osnovama penzijskog i invalidskog osiguranja, "Službeni list SRJ", br. 70/ 2001);

Montenegro reflects bad situation and relationship between labor market and pension system. Previous system gave a lot of possibilities for the acquiring rights for the pension, especially invalid, and therefore it is not surprisingly that in the structure of the pensions there are less than half of those above the limit age pensions.

Bad situation in pension system, and bad relation between pension system and labor market, which was visible through non simulative activities of that pension system on process of employment, opened the need for comprehensive reforms in existing system of pension insurance in Montenegro. Law on pension and invalid insurance[60], that was in forced on January 1st 2004, introduced measures that reform first pillar of pension system, that is existing pension system of intergeneration solidarity. Reform was attempt to create precondition or better and safer position of all retired people, but also base for better functioning of labor market, through better relationship of incomes employed people receive and pensions that they will receive in future. Most important measures that were introduced by this law are:

- Gradual increase of age limit for the retiring of people (65 was limit for men and 60 for women)
- Change of pension formula- new pension formula included so called "point" system of the calculation of pension[61]
- Increase of the number of years that are included in the calculation of pension- by then pension is calculated by the best 10 consecutive years. In first year of the introduced reform it was taken 12 best consecutive years. The number of years used for the calculation of the pensions will be increased every year by two years until it reaches total number of years in working period.[62] Point system was introduced because use of it creates

60 Law on pension and invalid insurance (Zakon o penzijskom i invalidskom osiguranju, "Službeni list RCG", br. 54/2003),

[61] Every year in which employed person contributes to the system of current financing, he-she earns „points". Employed person that receives on average sallery get one „point" per year, while person that earns two average sallaries gets two „points" per year, and person that earns x average sallaries, earns „x/average sallary points" per year. The amount of pension is computed by formula, that presents multiplication of personal points (LB) and amount of pension for one personal point, that is same for all insured people on the day when that right was received. Personal point of insured person is computed when personal coeficient of insured person (LK) is mulitplied by the number of years of his/her pension duration (PS). Personal cofifcient is computed on the way that year personal coeficient of insured person for every year starting from 1970 that is from the start od insurance is sumed up and divided by the period for which they were computed. The amount of pension for one personal point isadjusted at the same way as pension.

[62] For every of those 12 years sallary is compared with average sallary and received 12 different „points". Average is computed from those „points" (simple aritmetic mean- „points" for every computed year are summed and divided by the number of used years) to get average personal „point". „Personal average point" is multiplied by the working period of futer retired person and value of one point which is presented as money value.

direct relationship of the income one gets, and therefore amount of paid contributions with received pension. Same formula is used for every year of working periods and same for men and women.

- SWISS adjustment of pensions- pension are adjusted according to the methodology that takes into account change in the cost of living and average gross salary.[63]
- Spreading of the base for payment of contribution- for all incomes that person receives for his/her paid work he/she should pay contribution no matter of the type of contract, type of salary or fee for work, and no matter whether income is from one or more jobs.[64] In the other words, no matter of the type of income and contract arrangement that presents base for that income, contributions should be paid on total income that one persons gets using his/her working force. This approach is more flexible and provides possibility of monitoring dynamics at the labor market.
- More accurate conditions for receiving invalid, family pension and other special rights.

Later revision of this Law introduced important changes that were reflected in the decrease of the contribution rate for pension-invalid insurance that would give visible effects such as increase in the number of registered insured persons that is increase in the number of the registered working places and therefore impulse to increase employed persons. By the revision of the Law on pension-invalid insurance from 2005[65] contribution rate is decreased for the pension-invalid insurance to 20%. The contribution rate was previously decreased from 24% to 21.6% of gross salary. Also, during 2007 Montenegrin Parliament adopted Law on contribution for mandatory social insurance.[66] According to this law, contribution rate for PIO was 21% of gross salary during 2008 (employer pays 9%, and employed pays 12%), while during 2009 and 2012 that rate was 20,5% (employer pays 8,5% and 5,5%, while employed pays 12% and 15% respectively).

[63] Precentage that is used for adjustment presents half of the sum of percentages for increase (or decrease) in the cost of living and half of the percentage of increase (or decrease) of average gross salary. The perecntage of the increase of cost of living is represented by half of year rate of the index of consumer prices or half of year rate of inflation. Nominal salary is published in the official statistical monthly reports of the Statistical Office of Montenegro (MONSTAT)

[64] Basically, it means that no matter if one has employment contract, contract about providing services or some other legal contract for income of the work, on that income contributions should be paid. The new was that incomes are summed up, so if someone has full time employment, and it he free times he/she works part time job, he/she should pay contribution on both incomes.

[65] Modification and amendment of the Law on pension and invlaid insurance, Službeni list Crne Gore, 29/05

[66] Law on contribution for mandatory social insurance, Službeni list Crne Gore, 13/07

On the other side, comprehensive economic reforms in Montenegro introduced number of important changes in the tax system whose intention was to create simulative conditions for business and employment. Change of tax regulation that was conducted at the same time as pension reform, that is change of contribution rate leaded to the increase of the base for which contributions were paid to pension fund. As it was stressed before, every income of employment, that is working activity required payment of contribution (fee, severance pay, bonuses etc), except benefits that were paid in accordance of the minimum of the General collective agreement.

These first reform measures had positive effect on short term, since state owned Fund for pension-invalid insurance (Fund PIO) had increase in the revenues from contributions, and percentage of the coverage of the expenditures for gross pensions by the revenues from contributions increased to 85,5% during 2008.[67] However, short term effect of the reform measures, as well as influence of global economic crisis caused decrease of this percentage during 2009 and 2010 comparing to previous years.

Table 1: Participation of the revenues from the contributions for the coverage of gross pensions and total expenditures of Fund PIO

	Coverage of the expenditures for gross pensions by the revenues from contributions	Coverage of the total expenditures of Fund PIO by the revenues from contributions
2001	64.3	55.4
2002	76.3	61.1
2003	80.5	65.6
2004	80.1	68.8
2005	81.6	68.7
2006	84	70.4
2007	85.4	73.8
2008	85.5	74.5
2009	65.9	56.09
2010	75.5	70.73

Source: Fund PIO

That is the reason that further reforms of current pension system were introduced in 2012 which included new reform measured such as introduction and adoption of Law on modification and amendments of Law on pension and invalid insurance.[68]

[67] Source: Fund PIO

[68] Law on modification and amendments of Law on pension and invalid insurance. Službeni list Crne Gore, 78/10

Implementation of this Law that was in forced on January 6th 2011 continued reform of pension and invalid insurance in Montenegro. Most important changes introduced in pension system of Montenegro were:

- Gradually assimilation of men and women regarding the conditions for receiving right to old-age pension;
- Gradual increase of the age limit for receiving right for old-age pension to 67 years by 2025 (for men) and 2041 (for women)
- Possibility of getting pension with 40 years of insurance no meter of the age o life;
- Introduction of the institute: earlily old-age pension;[69]
- Gradual increase of age limit for the right to receive family pension to 52 years for widowed person;
- Change into the way of adjustment of pensions[70]
- Calculation of special working time for women that have children- six months for one child
- Higher values for the working insurance after the 40 years of working time and other solutions.[71]

Law solutions are affective immediately after Law is in force, except solutions which refer to increasing of age limit for getting right for old-age and family pensions which will start gradually implementation from 2014.

In order to have more efficient function of labor market and better sustainability of pension system in Montenegro in 2006 were introduced voluntary pension funds[72], and therefore introduced second pillar of pension system. Creation of conditions for introduction of voluntary pension fund, that is introduction of third pillar of pension system, everyone in Montenegro has possibility to pay pension contributions on the voluntary base and in the amount person decides. That gives possibility to employed person get additional amount of pension, except that one he/she will receive from the system of intergeneration solidarity. This system should motivate employed persons to work longer and more productive.

[69] Earlily old-age pension is defined similary to old-age pension, but the amount of that pension is decreased for every month of the earlily application for pension before 67 years of life by 0,35%, and the amount of pension definied on such way is not changed after the persons that has right to that pension gets 67 years.

[70] The amount of pension for one personal point is adjusted since January 1st of current year on the basis of statistical data, change of consumer prices and average salaries employed persons at the territory of Montenegro in previous year comparing to year that was before, in the percentage that present sum of 75% percentage of increase that is decrease in consumer prices and 25% percentage of increase, that is decrease of salaries.

[71] Guide for getting right from pension and invalid insurance, Fund PIO

[72] Law on voluntary pension funds, Službeni list Crne Gore, br. 78/06 i 14/07

Evidence from world shows that introduction of private pension funds in many countries that had pension reforms increased activity rate at labor market. Although, this was important step forward, pension reform in Montenegro should be continued toward introduction of the second pillar of pension system.

Analysis of the number of retired people shows that number of people that had old-age, family or invalid pension was almost 100.000, what shows increase of those who use these rights from year to year. Although reform of the first pillar of the pension system was introduced with goal to decrease budget burden, and at short term it gives positive results, pensions still present one of the major expenditures from the budget. Besides that, negative demographic trends as well as ageing society will lead that number of retired people approaches number of employed persons. That would require additional reforms of pension system that should represent incentives for "older" employees and motivation for individuals to prolong their working period and work longer. Because of these expectations at labor market and in the pension system at long term, additional measures are required, before all introduction of the second pillar of the pension system, but also further support, promotion and intensively of use of the third pillar of the pension system.

3. Labor market in Montenegro

In previous years labor market in Montenegro was characterizes by constant changes since Montenegro was in the period of transition. Besides that, number of activities as wars in neighborhood countries also negatively affected situation at the labor market, and therefore pension system which is in direct relationship with the conditions at the labor market. Before transition processes started unemployment in Montenegro was extremely high, and the activity rate of population was at the low level, what affected whole pension system, that became financially unsustainable and dependent of budget transfers. During nineties of last century labor market was characterized by bad indicators. Particularly, during 1991, according to data from census, activity rate of population age between 15 and 65 was 51.6%, employment rate was 40.1%, while unemployment rate was 20.5%[73].

In the period after 1991 the unemployment rate increased as a consequence of many obstacles to economic activity manifested by economic sanctions. However, increase of unemployment rate was not that dramatically, as it was decrease of economic activity. That was result of the high protection rights of employees from that period. Decrease of employment at the labor market also decreased contributions for pension-invalid insurance, and therefore pension system was in problems. At the

[73] Source: MONSTAT

same time, unemployment in non-formal sector compensated loss of jobs at public companies. Increasing private sector generated new working places, but also creation of new working places in private sector was not as quick as lost of working places in public companies.

The beginning of the process of privatization also changed situation at labor market. Private companies function at the principles of effectively and the role of work as factor of production is changes. That creates need for deep and comprehensive reforms at the labor market in order to create conditions for effective functioning of private sector. Therefore, certain reform measures were adopted and through them regulation at the labor market was improved and created more accessible for business and provided better "cooperation" of labor market and pension system.

Labor market in Montenegro in the last transition decade was characterized by permanent changes. The beginning of privatization process created need for great change of regulation at labor market because concept of work and employment in public companies is significantly different from work and employment in private companies. Recidivism and influence of socialist concept of work and employment were very strong and reform of labor market and regulation at labor market was more demanding, and on the other side results that are achieved should be much appreciated. The goal of conducted reforms at the labor market in Montenegro was to increase flexibility and eliminate business barriers at this market, but at the same time to provide adequate protection of the rights of workers.

Most important act for regulation is Labor Law.[74] Old Labor Law from 2003[75] was attempting to increase flexibility at labor market. Two major changes were introduced by this Law, but they did not have that important influence on the flexibility of labor market. First change was decrease of the severance pay for workers from 24 to 6 average salaries. Second change was decrease from giving birth period from 18 months for second child and 24 months for third child, to 12 months for each child.

Labor Law was for many years one of most rigid laws that regulate working relations, not only in region, but even more. Private sector considered this law to be one of the basic obstacles for creation of business in Montenegro, since it was very hard to fire worker, what presented big problem for companies in private ownership

[74] Legal infrastructure of the labour market in Montenegro is consistent of Labour Law, Law on the protection on working place, Law on employment and work of foreigns, Law on peaceful solutions of working conflicts, Law on employment, Law on profesional rehabilitation and employment of persons with special needs, Law on contributions for mandatory social insurance, Law on taxes for personal incomes and General colective agreement.

[75] Labour Law, Službeni list Republike Crne Gore, broj 43/2003

that were confronted with higher number of employees than need. According to old Law[76], regulation of contract of temporary work in Montenegro was even more rigid then for permanent contracts. Law gave possibility for nine months regular contract which could not be renewed. According to the Law and opinion of inspection of work, if there is a need for some employment after nine months, than contact should be treated at temporary contract. Law gives possibility for temporary contracts only with the objective reasons (temporary increase in work, work on project, etc).

Collective firing is strongly regulated in Montenegro. Workers, syndicate and Employment fund of Montenegro should be informed about planned firing three months in advance. Besides that, employer should do program of rights of employed with same or different employer that work on different position, prequalification and severance pay. Employer is obliged to offer some of those rights, and workers can choose which right they want to use.

After few years of negotiations, Government of Montenegro together with the representatives of employers and syndicate prepared new Labor Law. Law was in forced in august 2008[77], and during 2009 modifications and amendments on this Law were adopted. This Law presents great improvement for private sector because it is more flexible and in accordance with EU standards. New in this Law compared to previous one is that it is forbidden to have direct or indirect discrimination of persons looking for job with regard to sex, birth, language, religion, color of skin, age, pregnancy, health conditions, that is invalidity, nationality, marital status, family obligations, sexual commitment, political or other affiliation, social origin, asset condition, membership in political or syndical organization, or other personal attribute.

Besides that, it was introduced possibility that employer creates working contract for defined period of time and employer has right to fire worker if he considers that there does not exist anymore need for him/her. That means that employer has a right that if there is no need for some part of working force, to fire some workers during some technological or economical reasons, or because of the restructuring of company. This fact is of great importance especially in the time of economic crisis. This change comparing to previous Law presents great step forward regarding flexibility of labor market, because previously employers were not motivated to hire new workers, exactly because there were not able to fire workers when there is no more need for that worker. That had negative influence on whole employment, and therefore also on the contributions that were paid for pension-invalid insurance,

[76] Low from 2003 which was modified and changed in 2004, Službeni list Republike Crne Gore, broj 79/2004

[77] Labour Law, Službeni list CG, number 49/2008 from 15.8.2008

According to the new Law, employer was obliged to register worker immediately for the pension, health and social insurance.

4. Labor market and pension reform in Montenegro

Pension system and process of pension reforms have direct influence on labor market of many countries, no matter of their political and economical status. Evidence from many countries shows number of similarities in the process of pension reforms, from which are of great importance those that relate on positive relation between these reforms and labor market. Before all, that refers to positive influence of decrease in the contribution rate for pension-invalid insurance on total employment in country. Previous system was not in the function of the increase of employability, so employers did not register their workers, while for register ones they paid contributions on the minimal amount. That situation also negatively affected pension system in Montenegro that resulted in the need for higher transfers from state budget. It is expected that further decrease of these contributions, will additionally stimulate employers to open new working places and register existing ones. Also, other reform measures affected increase of employment and higher financial sustainability of Fund PIO.

Labor market in previous years was not in the function of giving incentives to employability. Old Labor Law was not in accordance with standards and needs that existed among employers, so Montenegrin market was considered as one of the most rigid markets in Europe. New Labor Law from 2008 introduced number of changes that provide higher flexibility on the labor market and make this market more approachable and open. Before everything it refers to the possibility that employer can fire worker when there is no more need for him/her. Also, it defines rights of workers.

Ratio between number of workers and number of retired people in Montenegro in last decade was inappropriate and less than 2 employed persons paid contributions for one retired person, what it much worse situation compared with the period from 70-th and 80-th years when that ratio among retired and employed persons was 1:12.

Worse ration of the number of employed and retired persons was result of the bad economic situation in 90-th years of previous century. Criteria for receiving earlily and invalid pension were given according to nonmedical criteria and without periodical controls, what caused increase in the number of retired persons. That had negative effect on the ratio of employed and retired persons. By the reform that was

introduced, criteria became more difficult in order to decrease negative effect of giving earlily invalid pensions.

Table 2: Ratio of numbers of employed people and retired people in the period 2001-2010

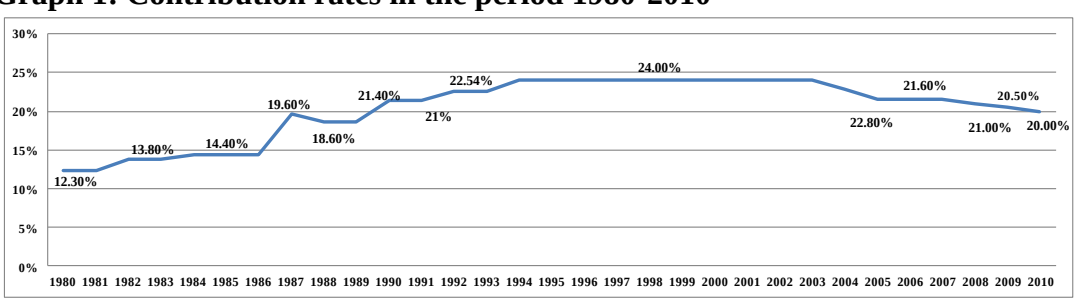
Year	Number of employed persons	Number of retired persons	Ratio of numbers of employed persons and retired persons
2001	141.112	83.938	1.68
2002	140.778	86.103	1.63
2003	142.679	88.845	1.61
2004	143.479	90.079	1.59
2005	144.340	91.542	1.58
2006	150.800	92.057	1.64
2007	156.408	95.210	1.64
2008	166.221	95.515	1.74
2009	174.152	97.088	1.79
2010	171.263	98.573	1.74

Source: Monstat, Fund PIO

Ratio of the number of employed persons and number of retired persons in last decade was decreasing in the period 2001-2005, when ratio between number of employed and retired person had lowest value of 1.57. However, because of the beginning with the pension reform and specific measures from that area, conditions became better until 2009, while in 2010 ratio of these two values fallen not significantly from1.79 in 2009 to 1.74 in 2010.

One of important measures that were introduced through pension reforms is decreased contribution rate. Effects of the decreased contribution rate importantly affected improvement of the conditions at labor market and had positive changes in the pension system. Main consequence of this measure is decrease of the gray economy, since employers started to register worker more and pay contributions with that lower rate.

Graph 1: Contribution rates in the period 1980-2010



Source: Fund PIO

Contribution rates in the period 1980 till 1994 had been constantly increasing. At the beginning of observed period it was 12.30%, while in 1994 it was at the level of 24%. Only decrease was in 1991 when rate was decreased from 21.4% to 21%. In the decade period until 2004 contribution rates did not change, and in 2004 it was decreased to 22.80%.

Pension reforms introduced decrease of the contribution rates. Contribution or pension insurance in 2008 was 21% of the gross salary (employer pays 9%, and employed pays 12%), while it was decreased in 2009 to the 20.5% (employed pays 12%, while employer pays 8.5%). Tendency of decreasing rate was continued in 2010 when the rate was decreased to 20% also with the decrease in the part that is paid by employer (employer pays 8% while employed pays 12%). However, no matter that the measures of the pension reforms were conducted, contribution rates are at the same level as from beginning of 90-ies.

Policy of decrease of contribution rates have positive effect on increase of registered employment. Decrease of contribution rate that is covered by employer from 9% in 2008 to 8.5% n 2009 shows positive trend of the growth in registered employment. In 2009 registered employment had reached its highest level in last ten years and it was 174.152 or 66% of active population. In 2010 decrease of contribution rate that is paid by employer for half of percentage point, did not have significant affect at the labor market because of the economic crisis and number of registered employed person was lower than in previous year for 7.1% and it was 161.742 registered persons.[78]

Analysis of demographic trends[79] in Montenegro in last decade shows that total number of citizens is not significantly changed in 2003. According to the results from census in 2006, in Montenegro lived 620.145 citizens, while according to census from 2011 total number is 620.029.

Very important characterizing of demographic trends n Montenegro is ageing society which is also reflected by the data from census when in 1991 average age in Montenegro was 32,7 years, from census in 2003 average age is 35,9, while in 2011 average age increased on 37 years. Analysis of the age structure of the population in Montenegro according to the data from the census from 2011 shows that population age 0 to 14 presents 19,2% of total population, population capable for work (from 5 till 64) presents 68%, and population 65 years and above makes 12,8 % of Montenegrin population.

[78] Survey about working force for 2010, MONSTAT
[79] Source: MONSTAT

However, very important is the fact that Montenegrin labor market is characterized by the low rate of activity[80]. According to the Survey about working force for 2011[81], average activity rate in Montenegro was 48.7% and it was decreased from 50.1% in 2010. Analysis of the structure of non-active population shows that 38.5% are retired persons, 26.9% are students, while 13.14% of population is non-active because of personal or family reasons. Age structure of non-active population shows that highest share has group age 15-24 (26.7%), then group 50-64 (22.8%). All this data confirm need for further reforms of pension system. Besides that, it is very important to work on increase of the employment rate of student population, by promotion of employment of students during their studies, what can be achieved through higher education system.

6. Concluding remarks

Analysis shows that reform of the first pillar of the pension system in Montenegro gives positive results on short run. However, negative demographic trends as well as ageing of the society in following period will lead to bad situation in the relation between pension system and labor market in long run, what will lead to assimilation of the number of retired persons and employed persons. That is why reform should be continued, and it could be done by giving incentives and creation of challenging conditions for work for older works, so they would be motivated to work longer. Priority measure, beside promotion of voluntary private pension insurance that already started to work slowly in Montenegro and introduction of the obligatory private insurance (III pillar o the pension system). This will provide overcoming of the lack of pension system based on intergeneration solidarity that also affects incentives at labor market.

Pension systems and process of pension reforms have direct influence on labor market in many countries, no matter of political and economical status. Evidence from many countries shows many similarities in the process of pension reforms, and many of them are of great importance since they refer to positive relation between reforms and labor market. Before all, that refers to positive influence of decrease in the contribution rate for pension-invalid insurance on total employment in country. Previous system was not in the function of the increase of employability, so employers did not register their workers, while for register ones they paid contributions on the minimal amount. That situation also negatively affected pension system in Montenegro that resulted in the need for higher transfers from state budget.

[80] Rate of activity presents percentage of active population in total population age 15 and older.
[81] Survey about working force 2011, MONSTAT

In order not to have situation in which pension system and labor market would lost their functions that are reflected in higher motivation for employment and higher involvement and access to pension system, further reforms and regulations that refer to these area are needed, as well as better cohesion of institutions. That is why contribution rates should ne decreases, and employers additionally motivated to open new working places and register existing ones. Demographic changes and their influence are visible through change of the social position of certain classes of society and social change that are caused by change of social class. That has important influence on the system of social security in Montenegro and its sustainability, at living standard and social involvement of certain classes of population should also be determinant of reforms in this area.

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Impact of migration ON LABOUR MARKET AND SOCIAL EXCLUSION IN MONTENEGRO

Abstract: *Today, 215 million of people live outside their countries of birth. Also, according to the estimations, one population of Montenegro (around 600.000) of Montenegrin citizens and their descendants live all around the world. This paper is analysing migration trends in Montenegro, and its impact on labour market and social exclusion. The analysis is focused both on emigration and immigration, but also on internal migration trends. A special focus is put on two periods between censuses, from 1991 to 2003, and from 2003 to 2011. It is very hard to extrapolate the impact of migration on demographic trends, labour market and social picture of the country. However, this paper, based on available data, studies, and information obtained through expert interviews, showed that impact of migration in Montenegro on above mentioned trends is significant.*

Key words: *migration, internal migration, population aging, labour market, social exclusion*

Migration is one of the most important issues in modern economy, and it seems that it becomes increasingly important with new events in the world and economy.

It is estimated that over 215 million of people, i.e. 3% of world population live out their countries of birth (World Bank, 2010 data).[82] Migration trends, of course, have different consequences on countries from where population is emigrating, and on countries to which this population is immigrating. Among the main impacts to accepting countries is the impact on labour market and this is made through the impact at the level of earnings, and through the lack of labour force for certain occupations. Beside this, migration has effects on the budget of receiving countries by increasing social care costs, and disproportionally income from taxes on new employees. Additionally, migration has a positive impact on the population aging process of countries of destination.

The impact on countries of origin may be also both positive and negative. The outflow of young, highly qualified people has an impact on reduced human

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[82] IMF (2011): Migration and Remittances Factbook

resources, additionally worsening the population aging process and it results in an insufficient supply of labour force for certain occupations. From other side, the income from remittances sent to countries of origin may represent an important impulse for economic growth and development (according to World Bank data for 2010, recorded remittances by development countries were 325 billion of dollars).

These data refer to the international migration. Nevertheless, internal migration, i.e. moving of population within one country, also has a deep impact on labour market, economy, and general development of society. It was considered for a long time that this migration contributes to the economy in the way that it enables employing the surplus of labour force from sector of intensive work in sectors with an intensive resources, and thus to absorbs the labour force surplus, e.g. in agriculture. However, in a number of countries, this process went so deep, leaving negative results in the foreground. Namely, it often happens that this migration contributes to increased unemployment in urban areas; entire leaving of rural areas; and increased part of population socially endangered.

Having in mind the importance of migration on economic and social development of one country, and through previously explained mechanisms, this paper analyses main migration trends in Montenegro, and examine if and how much they have an impact on country's economy, especially on labour market and social situation.

History of migration in Montenegro

Montenegro is a traditionally emigration area, and the history of migration is, before all, the history of leaving the territory of Montenegro.
The history of Montenegrin emigration differentiates several periods, and within them, several phases and directions of emigration.[83] The first period lasted from the end of 15th until the end of 18th century. During this period, the emigration was caused by political circumstances and relations with the most powerful neighbours, Turks and Venetians. The second period lasts from the end of 18th until and covers emigration from creation of central government authority until the declaration of principality. Within this period, the population mostly emigrated due to bad economic circumstances and epidemics, to Carigrad, Boka, Austria, Italy, later to Serbia, also to America by a certain number. The third period coincides with the emigration from Montenegro, from the declaration of principality until the Congress of Berlin 1878. Under this period, the emigration became more organised, but still to the above mentioned destinations. The fourth period is a period of international recognition of Montenegro in 1878, territorial enlargement and access to the sea,

83 Vukcevic, Milan, PhD (2006): "Causes and General Characteristics of Emigration of Montenegrin Population", Montenegro Diaspora Centre, Podgorica

until World War I. This period is characterised with a reduced emigration to old destinations where large actions slowly were ceasing (Europe, Asia, Middle East), and large emigration beginning in the North and South America. The fifth period covers the emigration of Montenegrins between World War I and World War II. Serbia (especially Metohija and Vojvodina), and USA were the most important destinations.

The sixth period refers to emigration from 1941 up to nowadays. This period is characterised by several phases, of which the first one refers to the period of largely organised emigration – colonization to Vojvodina, aimed at enhancing the population development in this district, i.e. eliminating negative consequences of the war which reflected in a decreased number of population, due to victims but also emigration of occupying forces from this area. Under this emigration flow, there were 31.011 inhabitants emigrated from Montenegro to Vojvodina[84]. This flow was followed by another migration of population mainly engaged in agriculture, from Montenegro to Vojvodina. The population, mainly from mountain areas of Montenegro, had connections with Vojvodina through the seasonal work or visit to relatives. A significant number of them were able to buy larger land areas in Vojvodina with the money from the sale of their land in area congested with local population or money received for land taken away by force due to building hydropower plants, mines, etc. Thus, there were 3 215 persons migrated from Montenegro to Vojvodina in period from 1953 to 1960, and 2 278 inhabitants during period from 1962 to 1970. Also, during this analysed period, the population of Montenegro migrated in less number to other republics and districts. This migration was mainly of economic nature. Thus, the period from 1953 to 1961 was characterised by a negative migration balance, i.e. 7.2‰ (CGZZS, 2008: 40). According to the census data from 1961, other Yugoslavian republics were inhabited with 75 800 emigrants from Montenegro.

The second phase refers to the period from 1965 to European oil crises in 1973. This phase is characterised with the migration from Montenegro caused by economic reasons. Namely, due to the economic reforms in the country which brought increasing unemployment in the country from one side, and significant economic growth visible in the countries of Western Europe, more and more people were seeking a job abroad. Main destinations of emigration were countries of Western Europe (Germany, France, UK, Denmark, Sweden, etc.), but also North America. According to the data from 1971, there are 11.000 citizens of Montenegro working abroad. Along with this migration, a spontaneous migration of population occurred between Yugoslavian republics. Thus, at the time of census there were recorded total 105 000 inhabitants emigrated from Montenegro from 1981. This migration was

84 Curcic, Slobodan (1995): "One Little Known Mass Migration to Vojvodina", PREGLEDNI NAUCNI RAD, UDK 314.722(497.113) „16/19", Novi Sad

slowed down during 1980s and 1990s due to weakening of connections between republics, political crises, but also opening of SFRJ toward abroad. But, at the end of 1980s, intra-republican migration was intensified and was of ethno-central character. The third phase refers to period from the beginning of 1990s until nowadays. During 1990s, Montenegro faced forced migration caused by war. Due to war events, a significant number of population immigrated to Montenegro from other republics. According to the data presented in the last report on Human Development in Montenegro, 16 259 refugees from Kosovo and 8 023 persons from Croatia and Bosnia and Herzegovina lived in Montenegro in April 2009. The majority of them (over 56%) moved to Montenegro during the war conflict in Kosovo. Also, there was more than a double increase of number of Montenegrin citizens working or staying abroad in period between censuses (1991-2003). The increase was 32 000, and it represented the most intensive increase from the occurrence of this population category in the middle of 1960s.[85]

Except for described international migration, the period after World War II in Montenegro is also characterised by migration of population from rural to urban areas. Economic possibilities were opening especially in places where new industrial and other facilities were built. These facilities in Montenegro were usually built in larger urban settlements and towns (Niksic, Podgorica, Pljevlja, Bijelo Polje, Berane, Cetinje, Kotor, Bar, etc.), their suburbs and/or their closer environment. [86] Thus, families were motivated to move from rural to urban settlements and town centres and from northern to central region or southern side.

According to the data of 2003 Census, of the total number of population of Montenegro, there were 40.8% moved to the settlement with permanent residence. Of this population, there were 36.6% of those migrated in the same municipality; 35.5% migrated from other municipality in Montenegro; 13.1% from Serbia, 12.6% from other ex-Yugoslavian republics, and 1.5% from other countries.

Regional and local dimension of migration in Montenegro

Previously described flows clearly reflect in the data too, indicating that from World War II the migration balance was negative in every period between censuses.[87] But, the migration balance in all regions was not the same. In census period from 1981 to 1991, the southern region (7‰) had a positive balance, while both southern and

[85] The same
[86] Kostic, Milica (2008):"From Village to Town, from North to South", Prosvjetni rad, Podgorica
[87] Penev, Goran (2008): "Demographic Trends of Montenegro from the Middle of 21st Century, and Perspectives until 2050", Statistical Office of Montenegro, Podgorica

central region indicated a positive balance in census period from 1991 to 2003 (12‰ and 2.1‰, respectively).[88]

It should be noted that when it is considered a person working or staying abroad, all three regions indicate an increase of Montenegrin citizens abroad from census to census. However, the most intensive increase of these persons was in the northern region, where both their number and their share in the total population, was more than 4 times higher in 2003 than in 1981. This area is an area with the highest percentage share of persons working or staying abroad (12.5%). Additionally, over a half of all Montenegrin citizens (51%) from this area is abroad.[89]
If local (municipal) level is focused in period from 1991 to 2003, there was a decrease in the number of population in the northern municipalities, from the total number of population, by 19.9% in Savnik; by 14.2% in Zabljak; by 18.2% in Pluzine; by 12% in Andrijevica; by 28% in Plav; by 8.6% in Pljevlja. The central region indicated a reduced number of inhabitants in Cetinje by 8%, while the southern region indicated a decreased number of inhabitants, only in Ulcinj by 16%. If compared, the data from Census 2011 and Census 2003, we can observe a similar trend is continued. Thus, the number of population in the northern region municipalities decreased in municipality Andrijevica by 12.3%; Berane by 3%; Bijelo Polje by 8.4%, Kolasin by 15.7%; Mojkovac by 14%; Pluzine by 24%; Savnik by 29%, and Zabljak by 15%. There was a decrease in the central region, as the following: in Cetinje by 9.8%; Niksic by 3.7%. The southern region indicated a decrease in the number of population in the following municipalities: Ulcinj by 1.8%; Herceg Novi by 6.5%; and Kotor by 1.5%. We can point out to municipalities indicating an increase in the number of population in period between two censuses. These municipalities are the following: Bar, Budva, Danilovgrad, Podgorica, and Tivat. This characteristic was not present among municipalities in northern region.

The total population of Montenegro increased by 0.81% in period between censuses (1991-2011), while a significant difference were noticeable by regions. The population of northern region in observed period decreased by 18% (from 218 00 to

[88] Although censuses 1991-2003 and 2011 Census used definition of permanent population, the data comparability is not complete, thus the conclusion on migration balance and population growth should be considered with certain care. Including the 1991 Census, the total population included all persons working or staying abroad, regardless of how long they are staying abroad. In accordance with the international recommendations, permanent population in the 2003 Census covered beside population in the country, also Montenegrin citizens working or staying abroad up to one year, as well as foreign citizens working or staying in Montenegro as family members more than a year, while the 2011 Census introduced a somewhat different definition of usual place of residence, thus the population in 2011 are consisted of persons continuously residing in Montenegro, at least from 1 April 2010, or arrived later in the place, but with the intention to stay at least one year. A person's intention in previous 2003 Census was not taken into account

[89] Penev, Goran (2008):"Demographic Trends in Montenegro from Middle of 20th Century until 2050", Statistical Office of Montenegro, Podgorica

177 000), while the population of central and south region increased by 12.1%, i.e. 10.4%. As a result of combined effect of internal and international migration, the population in municipalities of northern region constantly decrease. The northern region is a large area of Montenegro with the decrease in the total number of population, and depopulation is continually present from period between censuses (1971-1981) up to nowadays. Such distinct differences in international migration also reflected on the Montenegro population distribution by regions, e.g. in 1953 there were 47.3% of population in the northern region; the central region was with 34.6% of population. In 2011, the central region population was 47.3%; the northern region population 28.7%. The internal migration trend from the north to central or southern part also continued after 2003. This is shown by the 2011 Census data, although only as an indicator, and the number of population in period 2003-2011 in the northern region decreased by 8.7%.

A dominant flow of internal migration in Montenegro referred to village-town, while in the last two decades an increasingly important migration also became town-town. Both internal migration and current unequal distribution by regions and towns are caused by a number of factors, such as possibility for employment in central and southern region, better possibilities for education, better health care, etc. Main characteristics of internal migration in Montenegro are the following:

1. *The number of population living in towns grows much faster than the total population.* The level of urbanisation (a share of population that live in urban areas compared with the total population) increased from 58.2 in 1991 to 64.4 in 2011, while the number of population living in urban settlements increased by 4.1% compared with 2003. According to the order in size, compared with the size of Podgorica (30% of the total population), all other towns should be larger, and approx. 10% more population should live in Montenegro, than there was in 2012;
2. *Concentration of population in the capital.* The important level of urbanisation caused the population to be concentrated. Thus, according to the latest census, there is 1/3 of total population living in Podgorica, while 50% of population live in three municipalities: Podgorica; Bijelo Polje; and Niksic. Towns that absorbed the population flow, have expanded their territory with illegally built settlements in surrounding arable land and forests, resulting in the increased imbalance in the population-environment relation. Namely, the number of dwellings in Montenegro in period between censuses increased by 27%; dwellings intended for permanent living increased by 20%; dwellings for seasonal use by 53%; while dwellings for performing activity increased by 51%. The highest building activity was in Budva, i.e. 83%; this activity was 28% in Podgorica; and the northern region was present with only 13% of increase among the number of dwellings. Uncontrolled and unplanned expanding of urban settlements, followed by an

increased building activity and disrespect of building standards has a negative effect on space and quality of environment in general. Governing bodies for planning have not succeeded to control and to reduce too high and too fast urbanisation process resulting in not sustainable space use.

3. *Emptying suburb settlements.* Of the total number of settlements in Montenegro, i.e. of 1307, there are 4.4% of urban settlements. A high concentration of population in both central region and the capital caused the depopulation in certain settlements. Namely, of the total number of settlements, there are 38% of those with up to 50 inhabitants, while there are 3% of settlements with no permanent population. Number of empty (uninhabited) settlements in 2011 increased 39% compared with 2003.

Although the internal migration does not have impact on the change in the total number of population in one country, combined with external/international migration, it makes an impact on almost every population structure that later changes characteristics of natural population changes; has effect on economic development and other types of development; also making an impact on changes in the total number of population by individual regions. Having regard to the data availability from the 2011 Census, here will be observed the impact of migration on population activity and poverty.

Impact on labour market

It is very difficult to separately observe the impact of migration on labour market in Montenegro. However, there are several characteristics of labour market in Montenegro that can be connected with migration and migration trends.
Two main trends noticeable in demographic picture of Montenegro, from the World War II until today are population aging and decreased share of women. However, the period from 1991 is characterised by more distinct population aging, and contrary to previous period, by increased share of women in the population. Migration had an important impact on the changes in this period. Emigrants from Montenegro during 1990s were mainly young, aged from 15 to 20 years. From other side, the age structure of immigrants was similar to those distinctive for population of Montenegro, but the share of youth and children was significantly less than among the domicile population. [90]When the gender structure is considered, it is important to note that during 1990s, the majority of emigrants consisted of male persons, while females were the majority in the immigration population. Additionally, female persons are more present in the internal migration.

[90] Penev, Goran (2008): "Demographic Trends in Montenegro from Middle of 20th century, and Perspectives until 2050", Statistical Office of Montenegro, Podgorica

Although there are visible improvements in labour market in the last couple of years, there are still present problems among which the most important are the following: long-term unemployment, unemployment of women and youth, Roma, refugees, and displaced persons, as well as important differences in supply and demand. Already mentioned migration trends had an impact on the unemployment of female persons Roma, refugees, and displaced persons. Still, the main problem of Montenegro labour market is an imbalance between supply and demand for the labour force. According to the data of Employment Office of Montenegro, the highest deficit exists among the following occupations: waiters, nursing staff, teachers for the first class of primary schools, engineers, doctors, etc. Main sectors with existing deficit are construction, tourism, hotels and restaurants, agriculture, and trade.

It is clear that this situation is primarily a result of transformed economic system with new needs on labour market, position among population not accepting certain jobs, and very low mobility of labour force. Due to a lack of data on emigrants' education, it is very difficult to define if unmet demand for certain occupations is a result of migration trends. However, based on interviews we carried out, the conclusion is that the emigrated population can be divided in two groups: one consisted of highly educated population, and other one consisted of low educated population. Highly educated population leaving Montenegro is consisted mainly of doctors, professors, engineers. Those from the second group are mainly workers in construction, tourism, and hotels and restaurants. If this is taken into account, the conclusion is drawn that this part of emigrants could meet one part of demand existing in labour market. However, persons interviewed were doubtful that low qualified workers doing this type of occupation abroad would do this job at home. As a result of demand for certain occupations that is not met with the domestic supply, there are a number of seasonal workers in Montenegro that are mainly from countries in the region (Serbia, Bosnia and Herzegovina, and Macedonia). Sectors in which seasonal workers do their job are tourism, hotels and restaurants, construction, and agriculture.

Migration changes have an impact on Montenegro labour market trends, especially on their regional component. Due to outflow of active population from northern region to out of country and other regions, working activity and employment are significantly less in this part of country.

Table 1. The most important rate of population economic activity in Montenegro, by regions

	Activity rate	Inactivity rate	Employment rate	Unemployment rate
Montenegro	46.3%	53.5%	34.9%	24.9%
Southern region	48%	52%	40%	18%
Central region	49%	51%	38%	21%
Sjeverni region	41%	59%	25%	39%

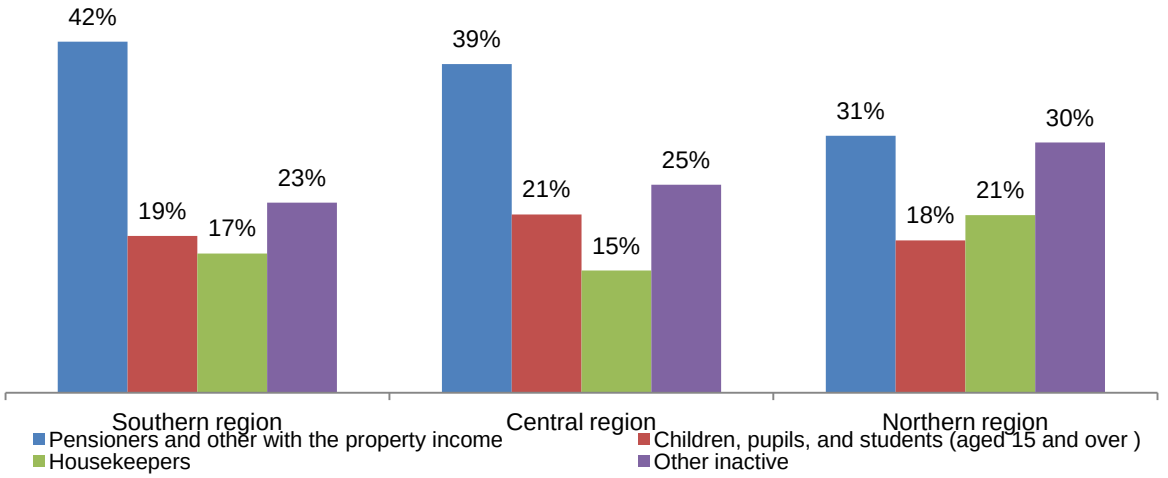
Source: 2011 Census, Statistical Office of Montenegro (active population: population 15+)

In regards with the employment, the majority of employed persons in the northern region works in service sector, the same as in other regions. However, of the total number of employed persons, there are 13.7% of those in this region working in agriculture. This share at the level of country is 6.5%; and 4% in other countries (MONSTAT, LFS, 2010). When considered the employment by sector and gender, there can be noticed a distinct difference which is characteristic for other regions too. Male persons are mainly employed in service activities (54%), while industry and agriculture is present with 30.6% and 15.4% of employed male persons, respectively. From other side, female persons are mainly employed in service sector, i.e. 79.4%, while a minor part works in industry and agriculture, i.e. 10.9% and 9.7%, respectively.

Among those performing activity in the grey economy, the majority lives in the urban part (54%), while there are 46% of population in rural part of country. The grey economy observed by regions indicates that 30.6% of the existing informal sector is present in the southern region; the central region 23.8%; and the northern region 45.6%.

When considered labour market, the main problem is unemployment, i.e. number of persons seeking a job and ready to accept the employment. However, from the other side an important share is inactive population (unemployed and no intention/wish to seek job). In regards with the inactivity rate, Montenegro has significantly higher inactivity rate, than it is the case in other countries. According to the Eurostat data, inactivity rate for EU 27 was 29% in 2010, with the highest inactivity rate in Turkey (48.1%). Similar inactivity rate as in Montenegro is in Bosnia and Herzegovina. In addition to the highest unemployment rate, the northern region also possesses the highest inactivity rate (59%). The structure of population inactivity by regions is presented by below provided chart.

Chart 2. Structure of inactive population by regions, 2011 Census



Source: Statistical Office of Montenegro

The share of pensioners in the total inactive population of Montenegro is 37%, while the lowest is the northern region, i.e. 31%; in the central region 39%; and in the southern region 42%. From the other side, an important share among inactive population in the northern region is of other inactive population, i.e. 30%, and housekeepers (housewives), i.e. 21% of inactive population of north region. The question is why, in region with unemployment characteristic, there is an important part of population (housewives, and other inactive) that are able to work, do not have an employment and they select inactivity, instead of job seeking? It is clear that the population in this region is older and less educated, because of young people outflow, than in other regions. According to the 2011 Census, an average age in the northern region was 39 years, while on national level it is 37.2 years.

However, the data on the population activity from the 2011 Census indicate that municipalities that have above average and very high percentage of population abroad, also have both higher inactivity rate, and higher unemployment rate. Housewives and other inactive population have the highest share in the total number of inactive in Rozaje (62%), Plav (60%), Ulcinj (54.7%), and Bijelo Polje (52.1%), and in the same time the lowest share of pensioners, and other with the property income. From the other side, the same municipalities have the highest unemployment rate: Rožaje (58.5%); Plav (50.4%); Andrijevica (43.7%); Berane (41.3%); and Bijelo Polje (36.6%). The exception is municipality Ulcinj, where the unemployment rate is lower than the national average, i.e. 21.9%. Remittances from abroad from the family members staying temporarily or permanently abroad make an important source of income for the population of northern region, resulting in a high inactivity rate. On the other side, National Human Development Report (UNDP

2011)[91], shows that the majority of parents (88%) considers that if their children are not able to find a job in municipality in which they live, they should seek job in another town. When observing the migration to other country for the purpose of job seeking, there are 70% of interviewed persons confirming that their children should seek a job in other country, if there is no job in their town.

Impact of migration on social exclusion

According to the National Human Development Report "Montenegro: Society for All ", the social exclusion is concentrated among certain vulnerable population groups, especially among RAE population (14.1%), and social welfare beneficiaries (11.9%). Displaced persons also possess a high value of social exclusion index, i.e. 8.3%. According to Laeken indicator for Montenegro for year 2008, population groups with the highest poverty risk are children, elderly, and women. In regards with these indicators, there are 25% of young people and 27.3% of elderly with median income lower than 60% of national median. Thus, groups especially exposed to poverty are social welfare beneficiaries, and long-term unemployed, pensioners with minimal income, persons with disabilities, RAE population, and displaced persons.

Human Development Report - HDR for 2004 shows that the household income structure (with relatives in the country or abroad) is on level of 19%. This share of income is extremely high in the northern and the southern region, 23.3% and 25.6% respectively. The data from the 2006 Report show that the household with the head born outside Montenegro had lower poverty rates (less than 4%), than those with household head born in Montenegro (11%), although several households exist in established category (8% of all households). As it can be concluded from the data presented, social benefits have an important impact on the household income, and thus the number of poor would be higher without this source of income.

Since the unemployment is the main determinant of poverty and social exclusion, it is not surprising that the northern region is facing with the highest problems of poverty.

Table 2. Poverty rate in Montenegro, and by regions

	2009	**2010**
Montenegro	6.8	6.6
North	13.2	10.3
Centre	4.0	5.9
South	4.4	2.6

Source: Statistical Office

[91] UNDP, CEED (2011), according to not yet published National Human Development Report, Podgorica

The poverty rate is the highest in the northern region, and in 2010 it was 10.3%. Rural population is facing higher poverty risk than urban population. The poverty rate in rural areas in 2010 was 11.3%, while in was 7.2%, and in other urban areas1.9%. The poverty rate in urban areas without Podgorica is only one third of average for Montenegro. Approx. 35% of the total population live in rural areas, of which there are 60.5% of poor people. The poverty is strongly connected with the status on the labour market. The poverty rate is the highest among unemployed persons, i.e. 12.1%, while among other inactive persons is 8.3%.

Another perspective on poverty can be provided through an analysis of the share of income that households spend on food. According to these data, households in the northern region spend 46% of their income on food. Households in central region and southern region spend 40.56%, and 33.7%, respectively. Accordingly, the Human Development Index (HDI)[92] is the lowest for the northern region. The HDI value for Montenegro is 0.828, while the northern region has 0.789. Andrijevica has the lowest HDI in Montenegro of 0.749. Other municipalities with a negative migration balance have HDI ranging from 0.75 to 0.8. The main differences between HDI components of the northern region and remained part of country are in the level of education and income per inhabitant. The data from NHDR 2009 indicate that the number of persons suffering from the social exclusion is higher in the north. According to the mentioned report, there are 5.9% of households and 10.2% of individuals which can be considered as socially excluded in the northern region compared with 3.5% of households, and 9.2% of individuals on national level.

Other two regions which are in better economic situation are lately facing certain problems due to rural and urban migration. In addition to spatial capacity problems, problems are also visible in labour market and in education system. For example, an increased unemployment rate is identified in large municipalities, such as Podgorica and Niksic, as well as an increased poverty risk. When it comes to the educational system, an important number of schools cannot accept all pupils. This problem will be additionally complicated by introducing new programmes in schools referring to practical work on computer for which additional space and investments are needed.

Conclusion

Main conclusions in regards with the demographic picture of Montenegro are the following:

[92] UNDP, ISSP (2009), National Human Development Report "Montenegro: Society for All", Podgorica

1. **Total population of Montenegro stagnates**, which decreases the economic force, especially in northern and north-east region. An intensive population growth of Podgorica (1/3 of the total population) and of southern region cause economic, social, and other problems;
2. **Large disparities exist in the area distribution** – there are only 28% of population living on 50% of territory of Montenegro (the northern region). According to the 2011 Census, the number of empty (uninhabited) settlements increased by 39%, while the share of settlements with less than 50 inhabitants makes 38% of the total number of settlements in Montenegro;
3. **Large part of population is economically inactive (53.5%),** what places Montenegro among countries with large percentage of inactive population. The share of inactive population in the northern region is 59%. Combined with a high unemployment rate of 39%, it causes high poverty rates;
4. **Population aging process** is increasingly important for Montenegro as a country with low birth rate. The population aging was especially intensive in periods between censuses (1991-2003, and 2003-2011). These periods had the highest increase of elderly share, then the highest decrease of young, and the most intensive increase of average and medial age, as well as aging index value.

The analysis also provided that the migration trends had significant impact on the demographic picture of Montenegro, but also on the situation in labour market and social situation in which population or individual population groups are. Still, this conclusion brings us maybe to the beginning of story, i.e. to the question "Why people migrate". The answer is: "In time of peace, before all, seeking for higher income and more quality life".

The migration of population in Montenegro is contradictory to changes and economic intentions of policy creators. We cannot speak about the development of north, even development, and not to have the population in that area. The population will exist in these areas, only if they can generate income there (what depends on themselves), and if they can easily communicate with the rest of country and world (what partly depends on the country too).

Additionally, we should especially consider that opening of Montenegro toward the EU will intensify migration trends, and thus, their impact on all perspective of our lives.

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The Economic Consequences of Demographic Trends

Abstract: *Number of inhabitants on Earth is on the constant rise and in the recent decades the growth is accelerated. In the following decades we can expect continuation of such trends while the growth will be slower and geographically misbalanced. Population is living longer so the demographic aging trend is more expressed.*

Europe and America have experienced benefits of the baby boom generation born in the period from 1946 to 1964. Following the sudden increase in newborns, causing increased spending for the child care and education, new generations of those able to work have emerged, increased productivity and contributed to the growth. Demographic dividends expired; golden generations became silver and then went to retirement. Now dividends became liabilities. The number of elderly in need for assistance, additional health and social protection has increased, while the number of the new able bodied and productive individuals which will pay for the additional costs has reduced. If the fertility rates would increase than the post baby-boom generations would face the double burden – increased number of pensioners and elderly demanding higher social and health "attention" as well as increased number of children to rise and educate. Probably the Europe will face this like situation in the decades ahead.

The main purpose of the paper is to analyze impact of demographic trends on the individuals, the economy, the private and the public finances. Due to geographic affiliation, and having in mind that the Europe as a continent is affected the most with the negative demographic trends the paper more closely analyzes consequences of these processes on the countries in the Europe and in Montenegro. Besides the analysis of the consequences, possible policies and limitations for their implementation the paper formulates policies for the decision makers.

Key words: *Demographic trends, costs of population aging, economic growth*

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Demographic outlook of the world

One out of mega-changes that humanity is facing is the rapid increase in the number of inhabitants. It took 250,000 years until the world population reached one billion of inhabitants, approximately in the year 1800. In order to reach number of two billion of inhabitants on the planet another thousand years have gone (1927), and then in only 33 years population has increased to 3 billion. Adnan Nević, who had been born in the Bosnian capital Sarajevo on October 12th 1999, had been declared as the six-billionth living person. Since then only 12 years have passed until the birth of the seven-billionth living person was celebrated in October 2011 in accordance to the official United Nations data. According to these measurements number of inhabitants on Earth has never increased faster and until 2050 it will exceed nine billions.

The population growth will be unequal and will differ among the continents and the countries. Sub-Saharan Africa and Europe in 2000 had the same number of inhabitants. Until 2050 the Africa will have three times more inhabitants than Europe. In some countries number of inhabitants has reached its maximum level and in following years will decrease. Such trends are already present in Russia and Japan. China will reach the maximum number of inhabitants of 1,4 billions in 2025 after which the population will decrease.

Despite the fact that population will increase, according to the UN population projections, the growth in the next 40 years will be lower as compared to the previous 40 years. Africa is the continent which will continue to record the highest population growth, while the Europe is the only continent which population will begin to shrink already in 2050ties.

Table 1. Demographic trends until 2050.godine – Number of inhabitants and percentage increase

	Continent	1970	2010	2050	2010/1970	2050/2010
		in '000			in %	
1	Africa	365.970	1.022.234	2.191.599	179,3	114,4
2	America	511.080	934.611	1.197.818	82,9	28,2
3	Asia	2.158.832	4.164.252	5.142.220	92,9	23,5
4	Europe	656.687	738.199	719.257	12,4	-2,6
5	Western Europe	352.720	288.257	307.084	-18,3	6,5
6	Eastern Europe	303.967	449.942	412.173	48,0	-8,4
7	Australia i Oceania	19.181	36.594	55.233	90,8	50,9

Source: World Population Prospects: The 2010Revision, United Nations

The second important demographic trend which world is facing is the population aging. Until 2050 global population will be much older. Number of inhabitants aged over 65 will double, from 8% of total population in 2010 to 16% in 2050. The so - called median age (the age at which exactly half the population is older and half younger) will rise by a full nine years in 2010-2050, to 38, an increase that is unprecedented in terms of size and speed. In rich countries, many people will have a life expectancy of 100.[93]

Demographic aging of population today is the key challenge for the most countries of the developed world. Africa is the only continent which is not facing demographic aging, primarily due to low life expectancy at birth, while demographic trends in Australia and Oceania and South America are not yet worrying. Demographic aging affects the most population of the Europe, North America while Asia is on the doorstep of the demographic aging.

Table 2. Demographic outlook of the world

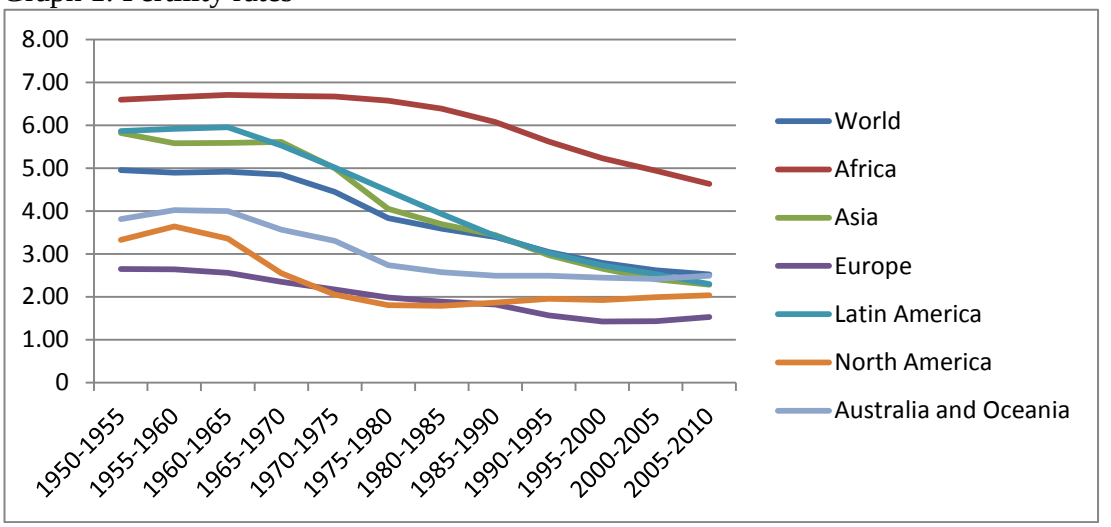
	Average age	Share in total world population	Life expectancy at birth 1970-1975	Life expectancy at birth 2010-2015	Life expectancy at birth 2045 -2050
Africa	18.8	22.5	45.9	52.6	64.8
South America	28.4	3.50	60.9	74.1	79.5
North America	37.5	7.0	71.7	79.1	83.3
Asia	31.7	57.3	57.8	70.8	77.5
Europe	41.5	8.7	70.8	76.0	81.5
Australia and Oceania	29.4	0.9	67.3	76.4	81.0
World	29.9	100	58.3	68.5	75.4

Source: World Population Prospects: The 2010 Revision. New York: United Nations, authors calculations

Higher life expectancy causes increase in the number of inhabitants, while declining fertility rates influence decrease in the share of the young population, i.e. to smaller number of newborns. Since 50ties in the last century, according to the UN data fertility rate in the world is halved i.e. decreased from 4.95 in 1950ties to 2.52 in 2010.

[93] Megachange, The world in 2050; Edited by Daniel Franklin with John Andrews, The Economist, 2012.

Graph 1. Fertility rates



Source: World Population Prospects: The 2010 Revision. United Nations

Demographic changes will have significant economic consequences in the coming decades. These consequences will be especially expressed in the countries which experience the highest degree of the demographic aging. On the same way as the higher share of the active population could mean the more productive economy lower costs for companies and the government, higher revenues, higher savings and investments, the population aging is causing less productive and less competitive economy, higher private and public expenditures. The demographic and economic consequences will have different intensity. Besides Japan which is for several decades faced with consequences of the old population (oldest in the world) which has continued to age, the "biggest looser" of demographic changes will be Europe.

Consequences of demographic changes in Europe

Average age of Europe's inhabitants is currently 41.5, which is by 11 years older than an average inhabitant of the world. In the decades to come European population will continue to age and by 2050 will reach average age of 49 years. According to the DG ECFIN[94] projections population of a working age in the EU countries will be reduced by 16% up to 2050, while population aged over 65 will increase by 77%. Dependency ratio (ratio of population aged over 65 and population aged between 15 and 65) will double reaching 51%. This means that in Europe on each person aged over 65 there will be two persons of a working age instead of four persons which is currently the case.

[94] European Commission Directorate General for Economic and Financial Affairs

Aging process and higher share of persons aged over 65 in total population, inevitably causes higher expenditures. The basic causes for the increases in the governments' expenditures are:

- pension system based on the intergenerational solidarity,
- health care,
- welfare, and
- long-term care.

Simultaneously, older population is also causing decrease of certain expenditures, primarily costs of education as well as welfare benefits for unemployed.

DG ECFIN in cooperation with the EU member states has prepared the projections of the future expenditures attributed to the population aging. Projections have assumed that the pensions, health, education and unemployment insurance will not be reformed. In accordance to the projections, in the first phase of the demographic transition the employment rates will increase and on that manner alleviate effects of aging. After 2018, when the baby boom generation is retired, working age population will begin to decrease. The GDP growth in EU15 will decline from average 2.2% achieved in the period up to 2010 to 1.8% in the period to 2030 and to 1.3% afterwards (projections did not take into account global financial crisis).Drop in the GDP growth will be sharper in the EU10[95] decreasing from 4.3% in the period until 2010 to 3% in the period until 2030 and to 0.9% after 2030. The sources of growth will change significantly. Employment has contributed to the growth until 2010, it will have neutral effect until 2030, while after 2030 will have adverse effect on growth.

According to projections, all these factors will cause increase in the public expenditures by 4 percentage points of GDP in the period up to 2030 in EU15 and euro zone, while the average expenditures in the EU10 will be higher by 1.5%. The lower increase in public expenditures due to aging in EU10 is primarily influenced by the pension reform in Poland and introduction of the second pillar. The highest increase in expenditures is expected in the pension system, health care and long-term care. On the other hand, due to lower inflow of the young people decrease in education expenditures as well in unemployment related expenditures due to increasing employment rates, is expected.

[95] The EU member states joined in 2004 – Poland, Slovenia, Slovakia, Czech Republic, Lithuania, Latvia, Cyprus, Malta, Estonia, Hungary.

Table 3. Overall public expenditures linked to the population aging in EU (pension, health, education and unemployment related expenditures) as % of GDP

	2004	2030	2050
Belgium	24,5	28,6	29,8
Denmark	25,7	29,1	29,4
Germany	22,7	23,3	24,3
Spain	19,5	22,9	27,8
France	26,7	28,6	29,7
Ireland	14,8	18,0	22,0
Italy	24,7	25,5	25,7
Luxemburg	18,7	24,0	26,4
Netherlands	20,4	23,9	24,8
Austria	24,6	25,2	23,9
Portugal	23,9	28,0	33,6
Finland	23,8	27,2	27,2
Sweden	25,7	25,9	26,2
UK	18,6	20,5	21,9
Cyprus	16,5	20,6	28,3
Czech Republic	18,9	20,5	25,8
Estonia	17,2	15,0	14,5
Hungary	20,6	23,5	27,6
Lithuania	15,5	15,7	16,5
Latvia	17,1	15,4	15,5
Malta	17,2	18,8	17,2
Poland	23,5	17,4	16,7
Slovakia	15,6	15,7	17,8
Slovenia	23,2	27,0	31,6

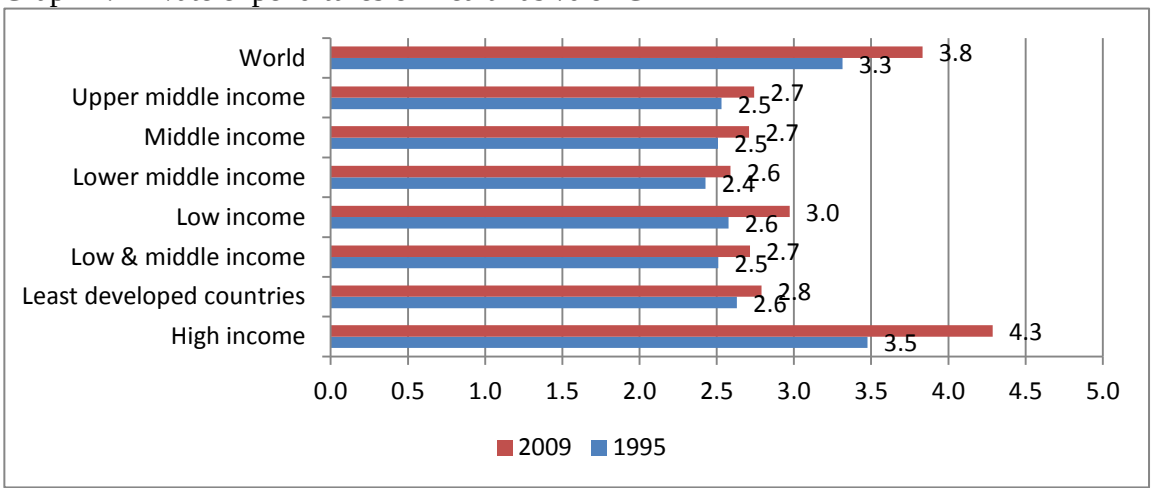
Source: DG ECFIN, 2006

General measures that the governments implement mainly relate to extension of the working periods, in improving ratio between numbers of employed and number pensioners and other welfare recipients'. The governments are more concentrated on the provision of basic benefits and social security for the most vulnerable, among which elderly. In the case that these measures would be sufficient for the control of the welfare and pension expenditures, the healthcare expenditures remain an separate issue. Average costs of the health protection and care for person aged over 65 are by three to four times higher as compared to the young person. The concrete policies of the decision makers are rare and nonsystematic, while the hope is entrusted in the technological improvements and innovations which should decrease the costs of health care.

Population aging, besides public expenditures would have significant impact on the private expenditures, primarily to the private pension schemes, private health expenditures and education expenditures.

Private pension expenditures in the period from 2000 up to 2008[96] have increased by 15% or by 0.3 percentage points of GDP. In case that similar trend is continued in the period to 2050 it is expected that the private pension expenditures would increase by 1.2 percentage points of GDP or by at least 60% as compared to the expenditures in 2008, or from 2.1% of GDP to 3.3% of GDP. However, having in mind expected reforms in the pension systems, the more significant increase in the private pension expenditures could be expected. Private expenditures on health[97] as percentage of GDP in the period from 1995 to 2009 in the world have increased from the 3.3% of GDP to 3.8% of GDP, or by 16%. The highest increase in the private health expenditures occurred in the high income countries, by 23%. If these trends in the in private health expenditures are continued private health expenditures will on average increase by 1.4 percentage points of GDP up to 2050. In the case of the high income countries, affected by the demographic aging, continuation of recorded trend would mean increase in private health expenditures by 2.3 percentage points of GDP until 2050ties and will reach spending 6.6% of GDP on average in 2050.

Graph 2: Private expenditures oh health as % of GDP



Source: World Health Organization, 2010

Private expenditures for education, according to the DG ECFIN projections will decrease, due to lower inflow of the young persons into education system. Simultaneously, having in mind that the aging, especially in the affected countries,

[96] OECD, 2010
[97] World Health Organization, 2010

causes the longer working periods of population, the need for continuous education and lifelong learning will increase. In the period from 2003 to 2008 private expenditures for education in EU have increased by 0.02 percentage points of GDP on average per year. If the similar trend is continued private education expenditures will double in 2050 or increase from 0.75% of GDP to approximately 1.5% of GDP.

Overall, observing trends in the past 15 years, especially in the high income countries, one can expect that the private expenditures which relate to aging up to 2050 will increase by 5 percentage points of GDP. If we take into account total cost of population aging in EU, both private and public, the increase in total cost of aging will range from 6.5 to 9 percentage points of GDP.

It is not clear how the countries in Europe will bear the burden of demographic changes. Even the sudden positive change in fertility rate would give results after 20 years, and meanwhile the expenditures for childcare and education would increase. Opening of borders for immigrants could mean more young and active work force but also brings significant challenges in social and political life. In some European countries accumulated wealth and income opens the space for flexibility while poorer and less developed countries do not have such choice. Demographic changes jointly with evidently longer term crisis destroy economies, public and private finances.

Challenges of the demographic changes in Montenegro

Montenegro is facing similar demographic trends as the rest of Europe. According to the MONSTAT's demographic projections, population in Montenegro will increase, while aging is evident.

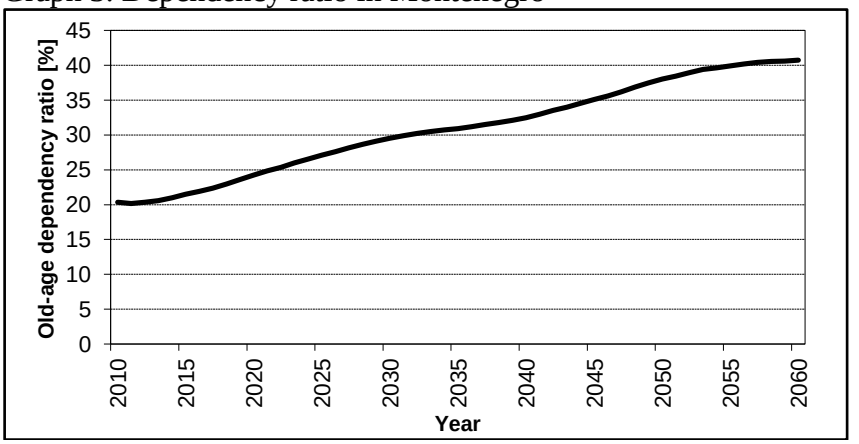
Table br. 4: Demographic projections for Montenegro

	Share of population aged over 65 in total population (average, brackets give the lowest and the highest values by the scenarios)
2005	12.5%
2020	15.0% (14.4%-15.3%)
2030	17.5% (15.9%-18.6%)
2050	21.8% (19.6%-25.2%)

Source: Demografski trendovi u Crnoj Gori od sredine 20 vijeka i perspektive do 2050.godine, MONSTAT

Share of population aged over 65 in total population will double from average 12.5% in 2005 to 21.8% in 2050. Life expectancy at birth will increase from 72.4 in 2008 to 78.4 while the dependency ratio will reach 38% starting from current 20%.

Graph 3. Dependency ratio in Montenegro



Source: Montenegro: Projections of categories related to the pension system Ekonomski fakultet u Ljubljani

Public costs of aging in Montenegro would, without structural reforms in the social protection system and education, increase by the 6 percentage points of GDP until 2050. However with the reform in the pension system, which is the highest source of expenditures, according to the projections, demographic aging will cost Montenegro similarly to EU10 average.

Table 5. 5: Estimate of the public expenditures attributed to the population aging with and without reforms

	2008	2030	2050	2008	2030	2050
	% GDP without reforms			% GDP after reforms		
Pensions	9.07	12.1	13.3	9.07	9.8	9.3
Health	4.68	6.0	6.5	4.68	5.5	6.3
Unemployment benefits	0.21	0.20	0.15	0.21	0.2	0.15
Education	4.6	4.6	4.5	4.6	4.5	4.4
Total	18.56	22.80	24.35	18.56	20.00	20.15

Sources: Montenegro: Projections of categories related to the pension system Ekonomski fakultet u Ljubljani and authors calculations base on the EU10 projections

In the case of healthcare expenditures, without reforms in the health protection system, public expenditures attributed to aging would increase by approximately 2 percentage points of GDP until 2050, while with existing reforms public health expenditures will increase by 1.6 percentage points of GDP. Population aging will influence on decrease of public expenditures for education by 0,2 percentage points of GDP. Expenditures that relate to the unemployment insurance scheme will remain the same since the EU accession process will probably influence that the amount of

unemployment benefit, currently relatively low, increase by which the positive effects of decrease in the number of recipients will be neutralized. According to rough calculations of the authors, and taking into account previous assumptions and all reforms that are completed or are ongoing, total public expenditures attributed to population aging will increase by 1.6 percentage points of GDP by 2050. In the case of no-reforms (initiated and planned) public expenditures attributed to aging would increase by the roughly 6 percentage points of GDP.

On the other hand one can assume that the private expenditures of aging in Montenegro will be similar to those of the EU and countries with the similar income level. Thus until 2050 private expenditures for pensions will increase by 1.2 percentage points of GDP, health care expenditures by 1.1 percentage points of GDP while private education expenditures will increase by 1.5 percentage points of GDP (assumption is that they will change similarly to those in EU).

Based on estimates, it is clear that the highest amount of costs will be born by the individuals directly since until 2050 expected private aging expenditures will increase by 3.8 percentage points of GDP while expected increase in public expenditures is approximately 1.6 percentage points of GDP. These public expenditures are also indirect cost to individuals through government redistribution. This also means that the implemented and planed reforms have alleviated negative impact of demographic trends on public finances but it is still present. Expected increase in efficiency should also bring benefits by reducing administrative costs, which in the social protection system make approximately 5% out of total social protection expenditures. Through additional reforms and more importantly through acceleration of economic growth the fiscal burden of demographic aging in Montenegro could become ”bearable”.

Challenges for the creators of ideas and decision makers

The future of the world and especially the Europe will heavily depend on the demographic changes and reactions of the policymakers. Pressure of the aging related expenditures is already now so high that has partly contributed to the crisis in the public finances that most of the countries in Europe are facing.

There are in general two possible choices for solving the issue of additional costs caused by negative demographic:

- implementation of policies that promote individual (personal) responsibility for old age and reducing the role of “caring” state (by returning to pre Bismarck period when the individuals were responsible for the provision of existence in the old age, which is the core of the pension reforms in a number of countries),

- continuation of existing policies which would mean higher government consumption, higher taxes and redistribution, i.e. to some new forms of socialism, if the system of public finances would overcome all financial crisis that inevitably would occur.

First choice assumes higher reliance on private initiative and personal responsibility for the old age, strengthening the role of state in providing basic functions, including social care for those who cannot secure existence. In the pension insurance system personal responsibility means that payment of basic social security contributions to the government is replaced by the individual investments and savings, either through voluntary pension funds, insurance agencies or through private investments. Longer work periods should influence the activity rates of population of a working age, i.e. participation of the productive population. Innovation, technological progress and promotion of the public private partnership should influence increase in efficiency and reduction of costs in the health system. Efficiency of the state and administration will be also important for the reduction of costs. Existing systems for registration, calculation and exercising rights from the social protection and health care suffer from obsolesce and lack of timeliness. E-government and application of new technologies should significantly decrease administrative costs and make services more efficient.

Second choice, delaying reforms means unreadiness of decision makers to face demographic aging. Continuation of existing policies in Europe would bring increase in government redistribution, lower incentives for individual responsibility, initiative and care, which ultimately would cause lower productivity and economic growth. By this base for redistribution would shrink and citizens due to government "care" would ultimately become less wealthy and less socially secured.

Reforms that are currently implemented in most of the European countries could be gradual transition towards higher individual responsibility but not the final solution. Moto of the reforms "sustainable, adequate and secure" pension system with upcoming demographic trends is not achievable. Existing pension systems, which are in the same time the highest generators of the aging cost, with demographic changes are neither adequate nor secure.

If in the future emphasis would be on the private pension schemes, private health insurance and essential return to pre-Bismarck period, demographic aging and challenges that the modern governments are facing could lead to decrease of the transaction costs in terms of the reduction of governments that redistribute funds. This would lead to lower tax burden and potential incentives for growth. Faster growth is the most efficient way for the governments to resolve social issues and challenges brought by demographic changes.

Conclusion

At one point in time, one hundred and ten years ago, in the development of society and the state as a group of institutions with the purpose to provide certain services to citizens, state (decision makers) have assumed heavy burden of provision of social security to all citizens. Benefits of such policy are utilized and now mainly the costs that have to be paid remained. These costs are so high and grow rapidly thus threatening to destroy the state itself. It is not just the economic growth and prosperity that are endangered but also ability of the state to fulfill promised and expected social rights. As it becomes certain and clear, decision makers are unwillingly pursuing unpopular reforms. However, it is not jet fully accepted that collective responsibility, popularly called generational solidarity in existing demographic outlook has exhausted its possibilities. Reforms of this system are mitigation and not solution of the problem. Time has come for individualization of responsibilities for all of those individuals that are able to create and take care for themselves, and for the government to focuses to create the most favorable conditions for development and individual "care".

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Marija Vugdelic[*]

From biodiversity to economy – there is only one *oikos*

Abstract: *Humans benefit from their natural surroundings in various ways and much of the economic activity is underpinned by biodiversity and ecosystem functions. And yet, there is an apparent paradox that they haven't been properly accounted for by economic calculations and policies, which results in their rapid degradation and loss. Data from around the world suggests that if such a trend continues, sustainable, equitable and efficient development and growth may not be possible to achieve.*

This article aims to explain biodiversity and how it translates into economic benefits by providing ecosystem services that human population uses and depends on. Demonstration of this link advocates the integration of ecological and economic knowledge and invites economists and policy-makers for an increased involvement in biodiversity conservation. Finally, the issues of biodiversity, its use and impacts on economy are discussed in Montenegrin context.

Key words: *biodiversity, ecosystem services, conservation, economic valuation, natural capital*

Introduction

Biodiversity is a relatively recently coined term that has permeated scientific and popular literature since the 1980's, and is becoming widely used in common language to describe the variety of life-forms on Earth. In its basic and most widely understood and used interpretation, it stands for the number of different species present on a particular spatial scale, such as when, for example, we count the number of species on Earth, in a particular country or in some geographic region, usually for the purposes of comparison. However, term biodiversity also describes the levels of variation and diversity below and above the species level – namely on the level of genes and ecosystems respectively.

Genetic diversity represents a variation in genetic make-up between species, as well as between individuals of the same species, as it can produce variation in any of the individual traits and features, such as size, growth rate, reproductive success, ability

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to tolerate temperature extremes, to resist diseases or catch pray. Genetic diversity is a product of evolutionary history and adaptations to particular environmental pressures (naturally or artificially induced), and it is usually spatially heterogeneous, so that populations of the same species can have very different genetic composition, which can ultimately lead to them splitting into new species. Such genetic diversity and differentiation within the same species is best exemplified by various breeds and races of domesticated plants and animals.

Finally, species engage in a whole suite of ecological interactions with each other and their environment, creating ecosystems, and the spatial diversity of such interactions presents the third level of biodiversity. A natural forest is an ecosystem with lots of interacting species, more complex than a desert, but a landscape all covered with one type of forest has less ecosystem diversity than the same-sized landscape that is a mosaic of such forest, grasslands and freshwater ecosystems.

In nature, however, those three levels of biodiversity create one continuum, and cannot be easily separated. Genes make up individuals and determine their behaviours and life-history traits. Those will be translated into population dynamics through reproductive rates, mortality, dispersal and migration, and the genetic divergence between populations can lead to creation of new species. Species dynamics is further translated into community and ecosystem dynamics through ecological interactions between populations and species (such are predation, competition, mutualism, parasitism), so when we try to assess biodiversity at a particular scale, all those components should be taken into consideration.

The importance of biodiversity - ecosystem services

As biological species, humans have always been a part of their natural environment and have used and depended on biodiversity in various ways. We have used and continue to use biodiversity directly, as nature-provided goods, such as food (fruits and seeds, fish and game animals), timber, fuelwood, fibre and medicines (an extensive review given by Chivian & Bernestein 2008). But moreover, we derive many indirect benefits from species and their interactions, most of which we are not even aware of, or take for granted, such is the oxygen in the air that we breathe, clean water, climate regulation, protection against floods and droughts etc (review in EASAC 2009). All those direct and indirect benefits that we derive from biodiversity are now collectively termed ecosystem services. Since those services are multifold and complex, the Millennium Ecosystem Assessment review (2005) has provided a now widely-used classification of ecosystem services for the ease of observation and research approach, and they are given in Figure 1.

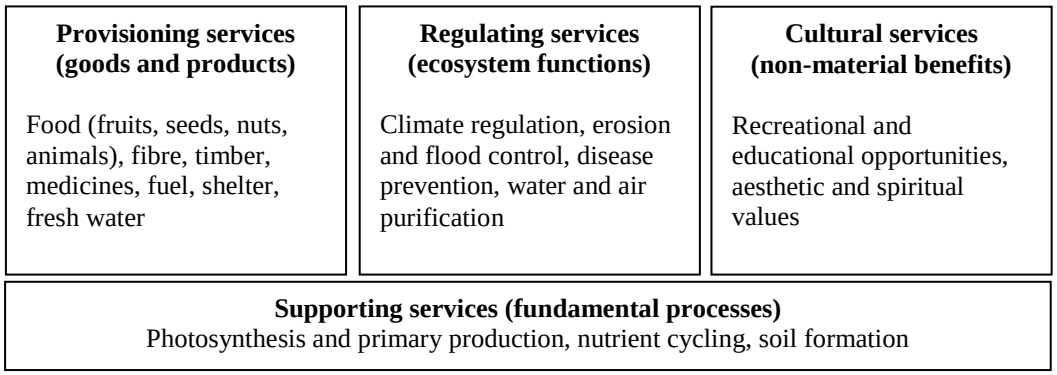

Figure 1 – Classification of ecosystem services based on the Millennium Ecosystem Assessment (2005)

As we can see, apart from being direct or indirect, ecosystem services can also vary in spatial (local, regional, global) and temporal (short-term, long-term) scales of relevance. As an illustration, we can observe a natural forest – it is a complex system of interacting organisms – trees, microbes in the soil, herbaceous plants, invertebrates that decompose decaying matter, higher animals that act as predators etc. It can provide local human populations with food (forest fruits, mushrooms, seeds), fibre, medicinal plants, as well as shelter and recreational opportunities. It may also support industrial activities such as timber production. Further, its system of tree roots binding soils prevents erosion, and together with animal burrows helps retain and filter freshwater and replenish aquifers, the benefits of which can be felt in communities downstream from this forest as well as in sectors such as hydropower, water supply or irrigated agriculture. This same forest also regulates microclimate through heath absorption and transpiration that affects precipitation, produces oxygen as well as stores CO_2 contributing to carbon as well as nutrient cycles. A more general illustration of those links is provided in Figure 2.

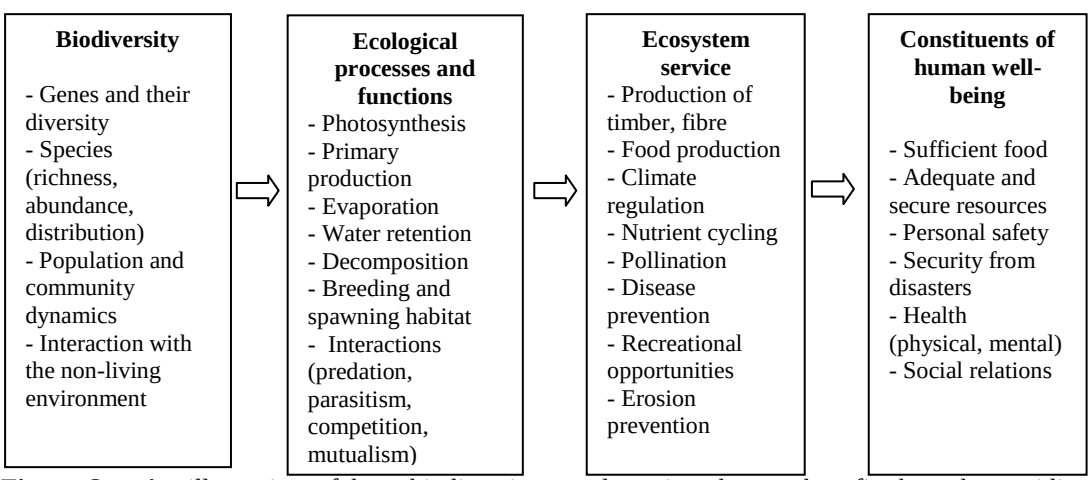

Figure 2 – An illustration of how biodiversity translates into human benefit through providing ecosystem services.

There are still theoretical arguments and practical problems in deciphering how biodiversity translates into ecosystem services and thus anthropocentric benefits (Schwartz *et al.* 1999). With provisioning services, the link is more obvious – the number and size of fish populations can be relatively accurately assessed and translated into food and economic income from fisheries. But with supporting or regulating services, the links between biodiversity elements and services the system provides are less obvious, and are more dependent on functional roles and interactions that can be hard to decipher (for example – the role of trophic webs, i.e. predator-prey interactions, in controlling the populations of species that are agricultural pests). However, studies are clear that complex natural ecosystems with diversity of species, populations and their interactions will be more resilient and better able to generate services than degraded or uniform systems consisting of only a few species, such are for example plantation forests or heavily modified agricultural landscapes (EASAC 2009). This additionally stresses the importance of preserving local populations and community and ecosystem interactions for maintaining the services we benefit from.

The loss of nature capital – causes and consequences

Species and population extinctions are natural processes that can happen because of intrinsic and extrinsic factors, and paleontological and historic records provide plenty of evidence of species that once existed but do not anymore (Ridley 1996). However, the scale of the species loss that is happening in the recent past as a consequence of human activities highly exceeds natural background extinction rates, even by a thousandfold according to some estimates (Frankham *et al.* 2002). Apart from species disappearance from the face of the Earth, even more worrying are the local extinctions of populations and disappearance of genes conferring local adaptations, and the consequent loss of ecological interactions which can cause further species/population losses on ecosystem scales, and overall decrease in ecosystem resilience to new perturbations (Begon *et al.* 1996).

The negative costs of biodiversity loss are becoming increasingly apparent, as consequences are starting to emerge in the form of the loss of valuable goods and services we derive from it and on which our welfare and development depend. Although, as noted above, there is still a lack of clear understanding how biodiversity translates into some of the ecosystem services, there is no doubt that dependence exists, and with the rapid loss of biodiversity, we face a decline and degradation of valuable services it provides. Indeed, Millennium Ecosystem Assessment (2005) has estimated that 60% of ecosystem services have been degraded due to the loss of biodiversity. Another study focusing on the European Union (Kettunen & ten Brink 2006) has collated concrete examples demonstrating the loss of ecosystem services as a direct consequence of biodiversity loss, outlining

the associated economic costs and social losses. Among the more interesting examples in that study is the one from Sweden, where the high level of eutrophication of coastal waters and consequent disruption of the ecosystem has led to a decrease of fish spawning rates reflected in the decrease of catch and losses of €6-8 mill/year for local fisheries, as well as the loss of recreational opportunities along the coast.

The main causes of those losses include habitat destruction (because of land use-changes such as conversion of forests and wetlands into agricultural or urban lands), overexploitation (for instance in commercial fisheries and hunting), pollution (discharge of organic and inorganic substances from agriculture or industry into the environment), invasive species (deliberately or accidentally introduced to new habitats by humans, where they disrupt local ecological interactions) and climate change that has become one of the main global environmental issues (Begon *et al.* 1996). Those drivers are a direct consequence of the rapid increase in the human population size, its demands and consumption rates, and associated social, economic and technological changes (Millennium Ecosystem Assessment 2005).

There is hardly anyone on Earth who is not, at least to a degree, aware of the links between humans and biodiversity and our dependence on ecosystem services. And yet, the conservation efforts and all the awareness raising campaigns carried out so far have provided rather limited results, so that we still witness loss of biodiversity and associated services, as the Swedish example above clearly illustrates. Although the drivers of this loss have been noted above, and efforts undertaken to reduce or mitigate them, the problem persists because its roots go deeper than that and are embedded in the traditional way that natural capital is viewed and valued. Connections in nature are complex, dynamic, non-linear, and it can be hard to predict consequences of certain human actions. For instance, a loss of some biodiversity element can result in a failure of ecosystem service far from the location where it has been lost (e.g. removal of a forest will affect water regime far downstream from that location), or much later in time (observed, for instance, after introduction of non-native species that in time become invasive and eliminate other species). Moreover, ecosystems can withstand perturbations and then crash rapidly (e.g. fish populations can withstand steady increase in fisheries until one point and then crash abruptly). Because of all that, it is hard to measure, monitor and report on natural capital in a way that can give reasonable predictions, so values of biodiversity and costs associated with its degradation and loss are rarely properly accounted through economic indicators and markets, nor reflected in policy-making processes or decisions of businesses and citizens (TEEB 2009).

Another level of complication in this story comes from the ‘public good’ nature of those services, meaning that both the benefits of biodiversity conservation and the

costs of biodiversity loss tend to go beyond the individual or group who initiates the action and be disproportionately distributed through the society, which makes them hard to regulate. This means it is almost inevitable that biodiversity will be under-provided by the market, as there are weak incentives for individuals to engage in conservation activities (either due to the fact that those who degrade biodiversity do not themselves face costs and losses from their actions, or because others will also benefit and so beneficiaries hope that others will pay the costs for "free-riding" behaviour). Biodiversity benefits and costs tend to be felt as externalities - as positive or negative consequences of an economic activity that is experienced by unrelated third parties, that are not reflected in the price of the goods or services being produced and for which no compensation is paid or received (TEEB 2009).

Therefore, despite the common consensus and increased awareness about the importance of biodiversity, its loss and consequent degradation of ecosystem services still persists, even on large scales. Because of all this, new approaches and attitudes towards biodiversity and its use and management are urgently needed.

Towards integration

While conservationists traditionally argue for biodiversity protection based on ethical considerations and because of its intrinsic values that are independent of human needs, the last few decades have seen the development of new approaches based on economic paradigms. These are providing ways to value biodiversity through ecosystem services, which are based on anthropocentric values and directly or indirectly linked to human development and wellbeing, by assigning monetary values and designing new markets and incentives for those goods and services (Heal 2000, Kettunen *et al.* 2009). A study by Costanza *et al.* (1997), estimated that the average value of 17 selected ecosystem services is $33 trillion, which is much higher than the global gross national product that at the time was $18 trillion. Even if treated with much caution, this estimate was useful for drawing attention to the importance of ecosystem services to economy as well as for demonstrating their irreplacibility.

Although there have been ethical arguments on assigning monetary values to nature, as well as theoretical and practical concerns about those valuation techniques, given the scale of human activities and consequences to ecosystem services they incur, there is a dire need to revise traditional management and decision-making practices in order to incorporate the value of those services (TEEB 2009). While economic forces and factors undoubtedly provide the main causes of biodiversity and ecosystem loss, economics also offers a suite of tools to assist in their conservation and sustainable use.

Ecology and economy have for far too long been perceived as opposing disciplines, two completely discreet or mutually exclusive human endeavours that have little in common. And yet, the Greek word *oikos*, or home, is in the root of both ecology ("the study of the household") and economy ("the management of the household"), and it indicates that in essence they are interested in the same thing – the relations between species, including humans, and their surrounding (i.e. the natural capital) and related interactions on which they depend. Despite that, those two disciplines have been treating the same subject matter in completely different and even opposing ways, with no initiatives to integrate theory and practical methods into one approach. Recent initiatives do take that path, because it has been recognised that human activities cannot be separated from the environment and that economy ultimately depends on the stock of materials and flow of services provided by nature. Therefore, economy needs ecological knowledge of underlying principles that govern functioning of ecosystems from which benefits are derived, so it can revise its theory and practical methods to incorporate information about nature capital. At the same time, it is unreasonable to continue conducting ecological work, especially in the context of conservation, if the needs of our society are not addressed.

Therefore, the role of economy in biodiversity conservation is becoming increasingly important, even unavoidable. In this new approach, the first step is the economic valuation of biodiversity and services it provides. The role of economists is then to work on designing and creating markets for ecosystem services that traditionally did not exist, like the carbon storage, watershed protection etc, so that the externalities referred to above can be "internalised" in people's economic behaviour, and their values can be actualised and then traded. The result of such an approach, as it has been demonstrated by a growing body of examples throughout the world, is that this creates new incentives for biodiversity protection, even in the stakeholder groups that have traditionally been opposed to conservation, such are landowners, private business and industry (Daily *et al.* 2000, UNDP-UNEP PEI 2008, WCBSD 2011). The goal is to make it more economically worthwhile or attractive for people to conserve biodiversity in the course of their economic activity than to degrade it. In such a way, short-term private and long-term public interests can be accommodated at the same time.

Montenegrin context

The ecological research studies of Montenegrin biodiversity demonstrate that our country has very high diversity indices, especially for some organism groups as well as diverse ecosystems, which make Montenegro an important biodiversity hotspot at regional, European, and even global scales (Ministry of Spatial Planning and Environment 2010). The causes of such diversity include our geographic position in the Mediterranean, which itself is one of global biodiversity hotspots (Conservation

International, web source), as well as in the South of Europe, where species took refuge during ice ages (Hewitt, 1999), diversity of climatic and geologic/paedologic factors (Radojičić, 1996) and long history of human-nature interactions.

We have used this biodiversity and continue to rely on it, so the services it provides significantly contribute to our society's functioning and economic development. A considerable proportion of Montenegrin population (38%) lives in rural areas (Ministry of Agriculture, Forestry and Water Resources, 2006) where they still directly depend on biodiversity and ecosystem services for their livelihoods (timber extraction for fuel, use of upland pastures for cattle grazing, collection of forest fruits and mushrooms etc). Moreover, Montenegro has adopted three main developmental directions that most closely rely on the supply of ecosystem services, namely; agriculture, tourism and energy sector, and this link will be briefly explored in subsequent paragraphs.

Agriculture

Agriculture, forestry and hunting comprise 11% of the national GDP (Ministry of Health, 2009). More than 60% of Montenegrin agriculture production comes from cattle breeding, primarily sheep. Sheep are raised in a traditional manner, by free-ranging flocks that graze on upland pasture ecosystems, which comprise 62% of total agricultural area (Ministry of Agriculture, Forestry and Water Resources, 2006), and thus provide an invaluable service to our agricultural sector. Further, 39% of Montenegrin agricultural export consists of alcoholic products, predominantly wine and brandy derived from growing autochthonous grape sorts like vranac. Other sorts of agricultural plants and animal breeds specific to Montenegro, like onions from Crmnica, buša cows, pramenka sheep etc, may not have high production rates, but they are well adapted to local environmental conditions and thus extremely suitable for organic production as they don't require additional nutrient inputs or special care efforts (Marković *et al.* 2007). Finally, an important segment of the food production sector are fisheries, which depend directly on the natural fish stocks in marine and freshwater ecosystems, contributing substantially to local economies (especially in the Skadar Lake region) as well as complementing the tourism sector.

Tourism

Tourism has been an important economic sector in Montenegro even during the times of Yugoslavia, but in the recent years it has become the main developmental orientation. Montenegro owes its status as a good quality tourism destination to still highly preserved nature. In this respect, the presence of natural and semi-natural landscapes still inhabited by wildlife is a service that provides a basis for development of various nature-oriented forms of tourism. Protected areas, in particular, whose mandate is to preserve designated natural habitats, play an

important role in this respect. Another associated ecosystem service that our tourism heavily relies on is the provision of drinking water – the most illustrative examples include springs in Skadar Lake and Crno Lake, both located within protected areas (National Parks Skadar Lake and Durmitor, respectively) where related ecosystems ensure the steady supply of good quality drinking water for tourists in main destinations along the coast and in the town of Žabljak.

Energy

The third main economy of Montenegro is the energy sector, where the large section of current energy production and majority of envisaged developmental plans are based on the hydro-potential, which has been estimated to be among the highest in the world (Ministry for Economic Development 2007). And yet, the quantity of water, the reliance on its constant supply and prevention of sedimentation due to erosion, depends heavily on the watershed protection provided by the forest and other upland ecosystems, which is particularly important in the limestone landscape which makes up most of our country. Finally, much of heat energy consumption, especially in rural areas of Montenegro, still comes directly from forests, and will probably continue to do so considering social, economic and demographic trends and projections.

Unfortunately, the level of environmental degradation in Montenegro has been on an increase in the recent years. Outdated industrial facilities, increase of urbanisation and pressure on forests and aquatic systems (both freshwater and marine), illegal hunting and fishing, disturbance of natural habitats and other harmful activities have all been observed and are taking a toll on our biodiversity (Ministry for Spatial Planning and Environmental Protection 2007, 2010). Reasons are many - low public awareness, conflicts between users, plans and legal rules, lack of sufficient human capacities for nature protection (Vojinović 2011). But, as argued above, the root cause of continued nature degradation in Montenegro lies in the fact that environmental issues are not integrated in developmental policies and a decision-making process and that coordination between developmental plans and activities of different sectors is lacking. Unfortunately, this short-sightedness may mean that the very policies and plans that are designed to stimulate and maintain economic growth and development may in fact be undermining it.

In Montenegro, biodiversity conservation is mainly achieved through protected areas, and there have been recent requirements to increase the surface of land under protection in the face of EU integrations (Ministry for Spatial Planning and Environmental Protection 2007). Unfortunately, because questions of biodiversity conservation are not integrated into policies and economic decisions, protected areas continue to be managed poorly and perceived as a non-viable form of land-use that hinders development.

A study carried out last year has for the first time tried to estimate the benefits of ecosystem services for the economy of Montenegro (UNDP, 2011). Through applying standard economic valuation techniques, the study shows that protected areas contribute to our economy with €62mil/year. Although this study is restricted in scope (it is focused on five protected areas) and based on limited data and extrapolations from other countries (which it clearly states), the undisputed conclusions is that a significant contribution does exist and that protected areas, indeed, provide a flow of economically valuable goods and services and are a stock of productive capital that it is not captured through standard economic methods. However, the study also demonstrated that despite providing economic benefits, there is significant public under-investment in protected areas (and thus biodiversity protection in general), which are not being managed to their full economic potential. So, if we continue to manage biodiversity in the same unsustainable manner, we will face substantial economic losses on the long-term basis. This is especially true if we consider other ecosystems not included in this study because they are not protected (like coastal ecosystems and forests for example), but the continued degradation and poor management of which can incur significant economic and social losses.

Final message

It has been increasingly obvious that biodiversity provides many direct and indirect benefits and that its loss through unsustainable use can incur long-term costs on most sectors of economy and hamper further development. In other words, biodiversity protection is not a luxury that cannot be afforded, but a necessity that we cannot afford not to invest in, and that profitability and environmental protection and thus sustainability are not mutually exclusive, but can go hand in hand.

With its main economic sectors based on natural goods and services, Montenegro cannot afford to allow continued loss of biodiversity and degradation of ecosystems. With its orientation towards an ecological state and ambitions towards EU accession and competitive economy, Montenegro has to start to genuinely address the issues of biodiversity and ecosystem services protection, and allow them to permeate all of our political, economic and social policies and decisions. Economists should play an important role in that respect, by striving to understand ecological knowledge in order to work on valuation and innovation of new markets for those goods and services we obtain from nature. This can create incentives for biodiversity protection, especially to private businesses, that could not have been achieved by ecologists/environmentalists alone, and can also bring Montenegrin economy new products and a new edge that can boost its competitiveness on the regional and global markets.

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The costs caused by the ageing of population and the impact on the competitiveness of the economy

Abstract: *This paper analyzes demographic changes, and assesses the impact of such changes on different social costs. Different projections regarding numerous countries' population, as well as data from Censuses show that negative demographic trends that already exist, will continue in the future. Similar situation is expected in case of Montenegro. This particularly refers to the considerable decrease of young population and increase of the share of elderly in total population. The impact of these trends could significantly affect the total social welfare costs, as well as, the overall competitiveness of the "ageing countries" economy. The changed age structure will put public finances in very unfavourable position due to the increased social welfare costs. Existing rules and increasing pension and health care costs are expected to lead to fiscal pressures and burden and to pose challenges for economic growth. Therefore, the aging of the population in Montenegro will be a critical public policy issue in the years ahead. The goal is to analyze the economic aspect of aging, with a special emphasis on government spending due to ageing.*

Key words: *ageing, fertility, costs, fiscal burden, pensions, health care, economic growth*

Introduction

Different levels of economic growth in some countries stipulate a different demographic dynamics and development of societies. Economic and demographic development are interrelated, although the development of one of them does not always indicate the simultaneous development of another. One of the most dominant demographic processes that characterizes modern society is the ageing of population.

Population ageing has negative implications for further economic and demographic development. On the one hand, the ageing of the population adversely affects both the total movement, and the structure of the population, and on the other hand, population ageing affects the reduction of the active population and increases expenses such as health costs and pensions.

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The ageing of population in developed countries of Western Europe began in the 18th century due to the long-term decline in fertility. After 1960's, beside the low fertility, increasingly important role has continued reduction in mortality rates, as a consequence of the development of medicine and better living conditions, which affects the longer lifetime.

The projections of the United Nations show that there will be more than 9 billion people at the world. However, despite the growing population, these projections also show that one quarter of the world's population will be older than 65 years.[98] Population ageing will be particularly pronounced in the developed and rich countries, but also in countries with high, even in those with lower incomes. Ageing is more caused by low fertility rates, than it is affected by longer life expectancy. By 2050, the world will get over one billion of working age population, and over 1.25 billion people who are over 60 years of age, while, on the other hand, the number of young people will remain at the same level.[99]

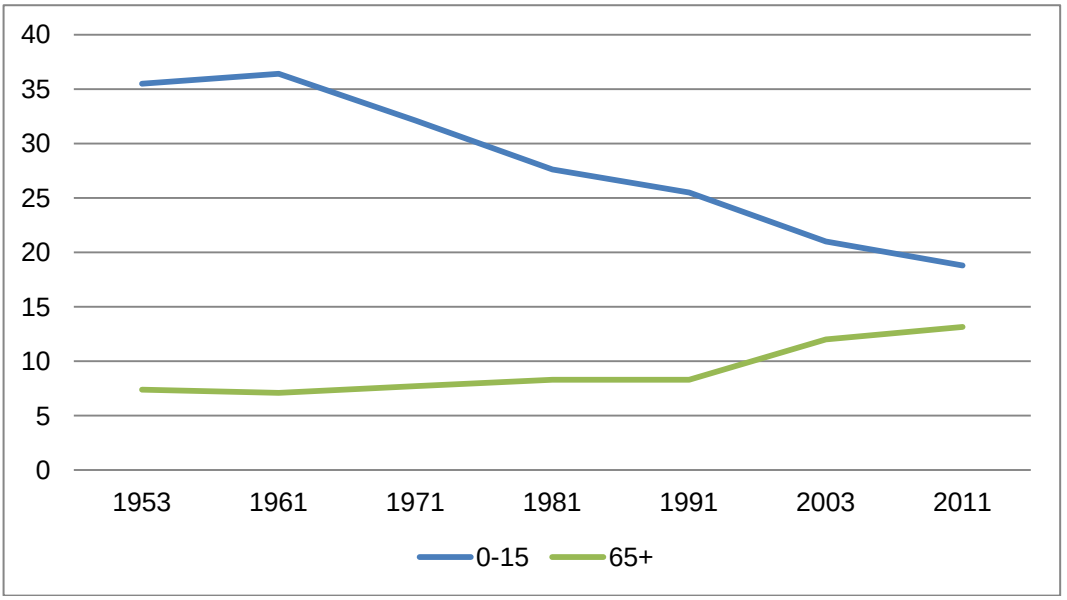
Due to such negative demographic trends, the governments of many countries will be faced with further financial difficulties. Similar situation is in Montenegro, because in the previous two decades there are constant negative demographic trends (low fertility rates, aging population) and numerous economic problems (high unemployment, the presence of gray economy, etc).

1. Demographic trends in Montenegro

Population aging is a problem that Montenegro has faced over the last two decades. Participation of elderly in the population has increased significantly over previous years. The number of people who are older than 65 years amounted 50,603 in 1991, while this number amounted 85,535 in 2011, with an average annual growth rate of 2.66%. On the other hand, the participation of young people (under 15 years of age) recorded the average annual decline of 1.53% (from 155,458 in 1991 to 116,453 in 2011). This is a consequence of low fertility rates during observed period.

Graph 1: The ageing of Montenegrin population – share of age groups in total population

[98] World Population Aging 1950-2050, United Nations, Department of Economic and Social Affairs, Population Division, 2009, pp.5-25.
[99] Ibid.



Source: Censuses 1953, 1961, 1971, 1981, 1991, 2003, 2011, MONSTAT

Similar trends will continue in the future, and the age structure will be further modified. According to demographic projections, the participation of the population older than 65 years will increase from 19.57% to 24.26% until 2050, depending on the scenario.[100] The results from Census 2011 indicate that pessimistic scenario is most likely, which assumes low fertility rates, expected mortality rates and expected changes in migration.

Table 1: Age structure of Montenegrin population until 2050

Pessimistic scenario				
Age group	**2020**	**2030**	**2040**	**2050**
0-14	105,927	96,317	85,423	78,768
15-64	435,798	438,346	440,492	420,303
65+	97,300	120,004	134,899	159,870
Total	639,025	654,667	660,814	658,941
Share in total population				
0-14	16.58%	14.71%	12.93%	11.96%
15-64	68.20%	66.96%	66.66%	63.78%

[100] Three scenarios of demographic projections are based on different assumptions about fertility trends in Montenegro in the period to 2050. Pessimistic scenario assumes low fertility rate, the basic scenario assumes medium-fertility rate, while the optimistic scenario assumes high fertility. For all three versions (pessimistic, optimistic and basic) there are same assumptions about the expected changes in mortality rates and migration. These projections are based on demographic projections conducted by MONSTAT in 2008.

65+	15.22%	18.33%	20.41%	24.26%
Basic scenario				
Age group	**2020**	**2030**	**2040**	**2050**
0-14	117,993	125,917	127,925	130,273
15-64	435,798	444,100	462,853	469,192
65+	97,300	120,004	134,899	159,870
Total	651,090	690,021	725,676	759,334
Share in total population				
0-14	18.13%	18.25%	17.63%	17.16%
15-64	66.93%	64.36%	63.78%	61.79%
65+	14.94%	17.39%	18.59%	21.05%
Optimistic scenario				
Age group	**2020**	**2030**	**2040**	**2050**
0-14	124,319	141,574	151,358	161,286
15-64	435,798	447,197	474,910	495,879
65+	97,300	120,004	134,899	159,870
Total	657,417	708,775	761,167	817,035
Share in total population				
0-14	18.91%	19.97%	19.89%	19.74%
15-64	66.29%	63.09%	62.39%	60.69%
65+	14.80%	16.94%	17.72%	19.57%

Source: MONSTAT, authors' calculations

The number of persons older than 65 years will almost double by 2050, and it will increase from 81,535 in 2011 to 159,870 in 2050, with an average annual growth of 2000 persons in this age group. This means that at the end of the projection period every fourth (pessimistic scenario), or every fifth Montenegrin citizen (optimistic scenario) will be older than 65, while today every eighth citizen of Montenegro is older than 65 years. If fertility rates which register decreasing trend remain law in Montenegro, and if the life expectancy increases during the projected period , the number of people older than 80 years will be almost four times higher. In that case, every fourteenth citizen will belong to this age group in 2050. On the other hand, low fertility rates will lead to very intense reduction in the age group 0-15, from 116,453 persons in 2011 to 78,768 persons at year end projection period, i.e. from 18.78% to 11.96%, as a share of total population. As a result of such changes in the age structure, population aging index will increase from 70 to over 200 in 2050. Slightly more favorable situation is according the basic and the optimistic scenarios, but it is clear that aging of the Montenegrin population will continue, which will undoubtedly affect the existing pension system in Montenegro.

2. The effects of aging on the costs of pension system

Projections of the basic pension system indicators show that the number of retirees will increase significantly due the aging population, while the number of insured persons who pay contributions for pension insurance will decrease or stay at the same level, depending on the scenario. The share of pensioners in the population will increase from the current 16% to the level of 21-25% by 2050. The growing dependency ratio[101] will represent a huge problem, not only for Montenegro but for all countries in the region and in many countries throughout Europe and the world that are faced with the problem of aging population. It becomes increasingly difficult to maintain a stable pension systems based on intergenerational solidarity (PAYG systems), and consequently the overall social protection systems in these countries. The projected old-age dependency ratio varies, depending on the considered scenario, but in any case, it will register the growth from the current 18.8% to over 30% by 2050.

Such changes in the structure of certain population groups, caused by an aging population will be reflected in increased total costs of pension systems. Deficit of the pension system based on intergenerational solidarity is a permanent problem due to population ageing, i.e. due to inadequate ratio between those who pay funds for pensions and those who use those funds. An additional problem is the fact that the state is generally proved to be a bad investor (especially in the former socialist economies). Specifically, during the years when the state pension funds recorded a surpluses, the state has not hesitated to spend them without planning. These two arguments are also related to Montenegro. Currently, the pension system expenditures amount to 12% of GDP. However, contributions for pension insurance paid by the insurers are not sufficient to cover these expenses since the funds collected through paid contributions amount less than 70% of total expenditures of the pension system. In order to provide pensions in the total amount, the Ministry of Finance covers the deficit from the state budget through the transfers to the state pension fund (PIO Fund) which is main institution in charge of the regular payment of pensions. Having in mind that this deficit will exist in the future (in a greater amount as% of GDP), and that the government would face numerous other obligations such as meeting the foreign debt, etc, then it is clear that the transfers for pensions due to population ageing will pose a huge burden on the state budget.

Projected expenditures for gross pensions will increase according each scenario, but that increase will be the most visible and problematic according pessimistic scenario.

[101] The old age dependency ratio is the ratio of the number of elderly people aged 65 and over, compared to the number of people of working age 15-64 years old.

Table 2: Total expenditures of PIO fund according different scenarios during 2010-2050 (million EUR)

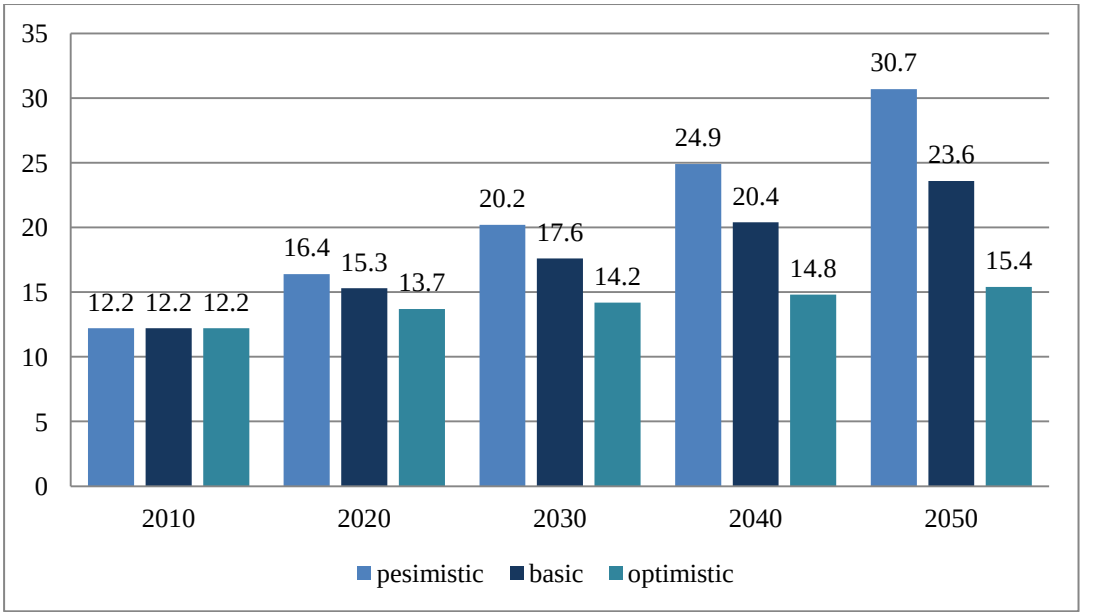
Year	Pesimistic	Basic	Optimistic
2010	365.55	365.55	365.55
2020	570.97	559.92	554.68
2030	815.08	786.44	772.82
2040	1168.57	1109.68	1082.32
2050	1671.05	1562.19	1513.31

Source: PIO Fund, authors' calculations

Total expenditures of the pension system will exceed 1.5 billion euros at the end of the projection period according to the all scenarios, which will be a significant cost for the country, bearing in mind increasing of total amount of transfers from the state budget. On the other hand, through the projected period, contributions will be lower than projected expenditures of the pension system and will continuously decrease as a percentage of expenditures (from 72% from 2010.), which is a direct consequence of the aging population. In each variant, the pension system will be faced with a larger deficit (total revenues of the Fund PIO will be less than its expenditures).

Financial sustainability of pension systems will be questionable because of the growing Fund costs and presence of deficit. That deficit of the pension system as a percentage of GDP determines its financial sustainability. The most unfavourable situation is the pessimistic variant. According to it expenditures of the pension system will reach even 30% of GDP at the end of the projection period, while today they are about 12% of GDP. Somewhat more favourable situation is basic and optimistic scenarios, by which the expenditures of the Fund PIO in 2050 will reach 23.56% of GDP, or 15.46% of GDP, respectively.

Graph 2: Expenditures of pension system as % of BDP during the period 2010-2050



Source: PIO Fund, Ministry of Finance, personal calculations

Expenditures will grow as a percentage of GDP, even in the most suitable. On the other hand, growth of revenues will not follow the intensity of growth of expenditures, which shows that increase deficit of the pension system in the future.

The growth of deficit as a percent of GDP is more important than growth in absolute amount, which will undoubtedly affect its financial viability. According to projections, the deficit will be the most significant in the pessimistic variant and will grow from the current 4.33% of GDP to 21.05% of GDP at the end of the projection period. At the optimistic variant, deficit of the pension system would be kept at approximately the same level during the projected period. However, given the almost impossible situation to achieve high fertility rate in Montenegro in the future, it is hardly possible that deficit will remain at that level. Even, by basic variant, which implies a higher fertility rate than the present, the deficit of the pension system will increase significantly and in 2050 will amount over 13% of GDP. This points the enormous problems of financial viability of pension systems in the future. The un-sustainability of the system will primarily be caused by negative demographic trends, i.e. aging of the Montenegrin population.

3. The effects of aging population to health costs

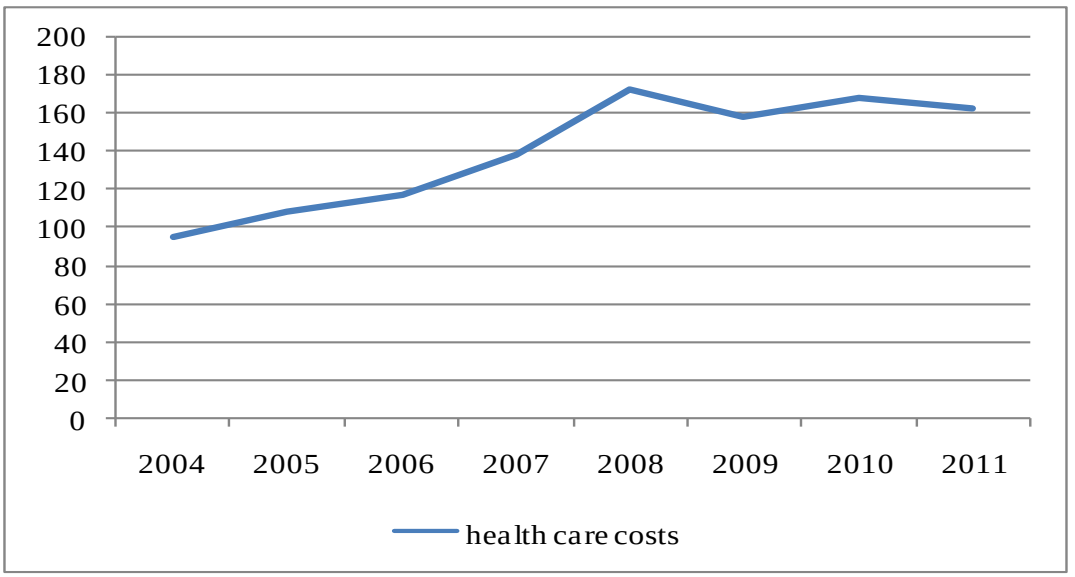
The age structure of the population affects the population epidemiology, disease and needs. Aging affects the growth of chronic diseases that directly affect the quality of life and increased health care costs, as well as growing demand for emergency

services and hospital services and for constant care in old age. Also, long-term care[102] of elderly people is becoming costly as it reduces the family care, and it can involve big losses due opportunity cost of young people who have to spend time caring for the elderly, rather than the time spent in productive work. Older people have much greater demands for health care and it is expected that health care costs will increase as the population is getting older, particularly where health care costs already exceed available resources. The amount of increasing costs depends on that does longer life expectancy means more years of health or illness and addiction.

In all countries of the world needs in public health are increasing more than ever before, because of the demographic situation, epidemiological pressure, rapid development of medical technologies for diagnosis and treatment, rising drug prices, especially innovative and biological, true assessment of quality of work and greater awareness of the population. Costs of treatment and prevention are growing faster than the economic basis of society. It is therefore necessary to develop adequate systems of funding that will provide access to adequate health care.

Due to the aging population in recent years, in all countries is present a large pressure on the health funds. Total health-care costs in 2011 in Montenegro amounted to €162.3 million, or about 5% of GDP. In comparison to 2010 due to the impact of the economic crisis the same were reduced by 3.7%. However, health care costs are in the period since 2004 increased. In 2011 costs of health-care in comparison to 2004 were higher by about 70%.

Graph 3: Total health care costs (in millions €)



Source: Health Fund of Montenegro

[102] Long-term care is consisted by wide range of medical, social and residential (housing) aspect

It is expected further deterioration of the demographic situation by reducing the number of children and the increasing life expectancy. According to the population projections population over the age of 65 years will increase, as well as their increased participation in the total population, health care costs will, similar as the costs of pensions, grow in the future in Montenegro. The older population is not active, but there is an increased need for health services, which will inevitably lead to higher health care costs. In developed countries, their participation in 2050 will be 27%, while 14% will be at underdeveloped and developing countries[103].

Use of health care services will be increased by aging of population, but the increase in health care costs can not only be related to the aging of population. Health care costs are influenced by other factors, too. Costs depend of the health status of the elderly and their needs for services. New research shows that in countries with high income older people have good health. Better health status of older people in developed countries are related to higher economic growth, and therefore higher spending for health, size and quality of service and technological innovation related to medical equipment and medicines. However, depending on the state of health, older people have a greater need for health services. It is therefore essential orientation towards patient approach in the domestic environment and at the primary level, where the efficient organization of the various services allows greater access.

Spending for the long term care i.e. for needs for preventive measures, screening programs, permanent cure, control of chronic diseases and use of relevant technologies will increase healthcare costs. However, timely beginning of these activities will further reduce overall costs. Higher costs of long term care will improve the general health status of the people and reduce the cost of clinical care. Most countries, including Montenegro, are not fully ready to absorb the impact of long term care costs, as opposed to clinical care. Demand for long-term care is inevitable due the people live longer and they are less able to perform their daily activities. Negative effects may be more if you do not introduce adequate programs to obtain adequate health care, as there may increase the public spending because of the use of expensive hospital care services that would otherwise be unable to provide much cheaper, or would could lead to decrease in the production, because the family members had to sacrifice a large part of their working time to care elderly.

4. Active aging

However, the aging of population are changing their consumption of goods and services in the long term, so that can be an opportunity for the development of new

[103] Janković Dragica, Zdravstveno osiguranje kao faktor troškova zdravstvene zaštite, Škola biznisa, No. 4/2011, 2011, pp. 77

services and new business ideas[104]. In Europe are recognized the opportunities for development of tourism adapted to various age groups, allowing the strengthening of economic activity and generate growth. Older tourists are specific market niche and they have the time and money (generated during working life) and may be particularly important for the consumption at the end of the regular tourist season.
Active aging creates challenges and opportunities for the companies, given that companies must be prepared to reduce the workforce by 30 million when the "baby boom" generation retire. However, according to studies[105], up to 68% of the companies has not yet adapted to the structure of the human resources such as situation, as well as their business. Although there will be a chance for the business based on 60% growth in the number of consumers aged over 55 years, only a third of the companies took this into account in planning their range of products and services. In EU, through a variety of programs[106] promotes retention of older workers in the labour market, while in the same time creates new business opportunities for the youth and trainings, in order to provide a neutral approach
Demographic changes have an impact on pension and labour market models. In EU is expected that expenditures for pensions could rise from 10% of GDP to 15% of GDP. Also, it is expected shortage of skilled labour force and lower activity rates, which would be caused by retirement of next generation of skilled workers.
Encouraging of older workers to work longer does not mean taking away jobs from young people, because EU countries that have the highest employment rates of older workers also have the highest employment rates among young people.
It is necessary to improve conditions at the labour market, taxes and incentives to retain older and trained workers on the labour market.

Conclusion

The official data indicates that share of elderly in the total population increased with the high possibility that similar trends will be in the future. This will affect the overall performance of the labour market, given that the share of working age in the total population decreased. On the other hand, increased dependence will cause the needs for additional state spending. This demographic change implies a significant increase in the number of users different programs and rights (the right to a pension, health care programs, etc.), which will result in higher pension system deficit and higher costs of health and social welfare and the impact on economic growth

[104] According to the some projections, structural changes will effects loss of two millions of work places in primary sector, while service sector will generate 6 million new work places in this decade.
[105] CSR Europe survey
[106] Program Tesco - 'Regeneration Partnership', Program - Carrefour - 'Passeport Sénior'; program Rewe Group - 'Fit for longer at the workplace', itd.

Apart from the aging effects on public expenditure, especially in the long term, it affects the forms of consumption and production of goods and services. Therefore, aging can be a challenge for new businesses and realization of new ideas

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CIVILIZATION AND TERRORISM: Links and Future?

Abstract: *Barbarianism derives from differences and lack of tolerance of people within civilization. Until civilization occurred people have functioned within „archaic societies" (Morin) i.e. small communities that were nomads and engaged in economy of collection. Appearance of "historical societies" (Morin) led to increase of organized groups existence and higher differentiation among them. As Benjamin notices history of societies is history of wars and it seems that hunger exactly had been driver of barbarianism. Additional problem became lack of integration within historical comparing to the archaic society.*
Nation-state and purity of ethnicity and religion as the core European factors of barbarism, totalitarianism and terrorism; economic and historical contexts as well as inclusion of civilian elements into nonconventional warfare remain outlines of contemporary terrorism. Even dough nowadays, economic dimension of terrorism and organized crime mesh can be added.
The key question is which form of global governance can adequately respond to 21st century's challenges? Whether the new humanism of Europe will be possible and whether Concert of the World will be created? Does it look possible that the very same can be launched by non-state actors and perhaps educational institutions?

Key words*: civilization, barbarism, terrorism, crime, finance, global governance*

Introduction

History of the world and history of the civilizations can be observed and interpreted in various manners. Some can seem *less serious* such is history of the world seen through various drinks.[107] On the other hand there are those that resemble *more serious* such is history of the world through the history of wars.[108] Observation that history of civilizations is actually history of fight against hunger interconnects aforementioned potential histories and gives precise determinant of appearances and

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[107] However, observation of civilizations through "trivial" mechanisms requires great (lack of)knowledge and ability of out-of-the-box thinking. In the same time it is being forgotten that majority of grand historic drinks occurred and had been used at least from two reasons: (i) as food, (ii) as exchange mean and sometimes as both.
[108] Potential problem with such approach is related to the fact that history of civilizations begun prior to beginning of the warfare. Under the warfare are considered organized clashes of larger parties.

processes drivers.[109] Beside that it connects historical processes, hunger and fights against it will connect also future processes and changes.

Precisely, hunger and need of fighting it is a common denominator of economy, population and terrorism. Hunger is perceived as driver of economic activities but also driver for their improvement.[110] Hunger addresses population while terrorism is being observed as economic related appearance. More precisely even if it does not have economic causes, terrorism has economic roots. For existence and execution of terrorist acts essential are money, ideology, individuals and population. Following that can terrorism activities evolution be expected?[111]
If we analyze past in this manner, does it mean that similar pattern can be applied on future as well? If future can be observed like that, than it seems that pattern lies in creation of efficient economic solutions but also global response to challenges. It does not mean that it will influence terrorism vanishing but can decrease incentives for its birth and development. Consequentially, it means decrease of negative effects to population and growth.

History of European civilizations' barbarianism

What is the difference between civilization and barbarianism? In what context civilization occurs? Whether civilization's basis profile can determine and shape its future? Who were barbarians? And for whom they were barbarians? Can civilization be *barbarian?* Is there a link between barbarianism and terrorism?

Edgar Morin considers civilization and barbarianism as two parallel processes. In that context he relies on Walter Benjamin and Gaston Boutul. Benjamin considers that *there are no features of civilization which are not simultaneously barbarian acts* while Boutul considers that *history of great societies is history of uninterrupted wars.* It seems like *at least* Boutul is right. And it seems that line of uninterrupted wars begins with civilization. And what the civilization is?

Within *archaic societies* characterized by small interlinked and integrated number of individuals, *economy of collection* and permanent nomad life exist dependence on *nature.* Is lack of openness of those societies disabling them to *meet the Barbarians?* Historical moment of transition to *agriculture economy* will not change only the shape of dominant production but also relations in the society including dependence. Concentration of *former* nomads around water sources or other strategic locations determines the beginning of *man's dependence from people*. It determines beginning

[109] Veselin Vukotic (2011) - personal notes from the subject *History of Ideas* at the first year of PhD studies "International Economy".
[110] Hunger considered as material and intellectual idea and need.
[111] Terrorism is seen here as the new warfare form.

of creation of *historic societies*. Precisely, dependence on other people (Vukotic, 2011) is the first element of civilization. Agriculture will create first ever surpluses of food and differentiation in the context of property will occur also for the first time. That will lead to wish for power and wish for hunger elimination. Quite often method of aforementioned was conquering and even more often, barbarian ones. Aforementioned will create the second civilizations' element.

However, it seems quite important in what context comes to the creation of *historic societies*. In what context people had born, grown and behaved? Even if it is not the oldest, it seems that European - Hellenic based - civilization *had given* the most to the world. Frankly, those contributions had not been always positive. On the contrary, there were some certainly barbaric. Despite to the Old East elements within it, Hellenic civilization has been quite autonomously shaped. Moreover, in one part differed significantly from prior ones. It seems that one of the core characteristics of Hellenic culture was domination of myths, conspiracies, murders, overturns and specificity.

Nevertheless, the question is what the *myths* are? Besides they are truly specific type of stories they are doubtless also *the nucleus of the culture*. Jung considered that myths are necessary as they *reveal* our society and our psychology confusion i.e. "monsters of the myth are monsters of the mind". Even if we need them, it is questionable whether the reveal or even strengthen confusion of our societies. Jung further believes that myths tell the truths about the human psychology. And that is particularly related to the omnipotent impulses and behaviours that are hard to control (rather collective than individual). And if Jung is right again, whether dark and violent myth is introduction into dark and violent psychology of the culture, of the civilization? Precisely, is European culture the culture of blood and conquering, culture of dark and violent psychology? Is *that* a part of European values? If yes, can it be neglected?

Hellenic mythology and story about Olympus is story about conspiracies and murders, about Chaos, Nix, Geia and Uranus, Ereb, Cronus and others. Moreover, the myth of Europe's kidnapping as starts the saga about (European), specificity and its chosen destiny (as Zeus has chosen Europe) bit also kidnapping and violence. Romans had assimilated Hellenic culture (since then is a dilemma who has really been defeated in those cultures clash) and further spread each their segment. Besides them, Celtic, German, Nordic, Finnish and Slav mythology had also been determined by dualities clash. Post-them Roman and Arthurian mythology introduces another dimension into this *game* - monotheistic religions. Precisely monotheism and its (none)related intolerance will develop the idea of the *pure nation* as the key segment of the first nation-state concept (the 15^{th} century one). Perhaps exactly that will shape *European invention in Barbarianism* as Morin

formulates it. Having that in mind, Greeks did not left only Olympics, philosophy and Eureka to us but also the dark psychology of Europe.

Nevertheless, who the *Barbarians* are? Analyzing history and changes of *historic societies* can be pointed that they are "those others", "not-us", different, "not Hellenic" and etc. Usually the line of diversification was difference of that civilization in the context of for example all "non-Romans" whether it was the language or any other kind of misunderstanding. Does it mean that each lack of understanding leads to definition of Barbarian? Has 15th century Europe created intolerance concept by introduction of nation-state and domination of ethnicity and religion pureness?

Has intolerance of differences (of Hellenic and then European) as well as post-intolerance of one than another monotheistic religion led to century-later-totalitarianisms? Did Hitler consider Slavs, Jews and Roma's as barbarians? Does it mean - even if they are such - that pursuit of different is allowed? Are there similar examples within Europe and at the Balkans? Is it unusual that Europe has created all totalitarianisms of the global world? Can it be said that European conquering and colonization have been driven by others' barbarianism? At the end, who really conducted barbarian acts?

Observing the birth of European civilization it seems that there is a barbarianism birth context as well. Violence, specificity and extravagance will become elements of European civilization "building" founded on the respective Hellenic elements. Greeks also gave us reverse of European civilization alongside philosophy, physics, Eureka and other important contributions.
Throughout the time Europe will go beyond Hellenic heritage. In the 15th century Europeans have innovated concept of barbarianism. Creating the idea of nation-state based of purity of the blood i.e. purity of ethnicity and monotheistic religion (Morin) barbarians got new dimensions. European invention - nation-state - will simultaneously destroy numerous civilizations which they conquered and colonized always in the "El Dorado" spirit.[112] Nevertheless, that spirit is nothing but *spirit of hunger and unlimited need for power*. The very same spirit will rule throughout Europe in the following centuries.

The beginning of the 20th century has been determined by another European innovation - totalitarianism i.e. *state owned by political party*. Perhaps the most important in the historic context of the three European's totalitarianisms birth (Fascism, Nazism and Communism) are not ideas rather historic framework and core

[112] Myth about El Dorado: the legend about golden city of Inca's which had been told by Pizarro's conquistadors became the matrix and synonym for tremendous earning possibilities. In the same time, the term is being used to mark almost all greed fevers.

moment. Observing all three of them can be concluded that they occur in the time of economic crisis and within governing system (regardless whether we talk about German elections, kings' mandate for government forming in Italy or Russian October revolution) based on belief in specificity and pureness. After that Europe will create first terrorist organizations of the new age. It also seems as another European invention. They also occur on the idea of fighting for the different causes using even civilian targets and means.

Whether Morin is right when he equalizes civilization and barbarianism? If civilization is dependence from *other people* and barbarianism *the difference* (to something, to someone) does it mean that they occur simultaneously in time? *Archaic (barbarian) societies* are small and integrated while *historic (civilized) societies* are large, non-integrated, deviant and comprehended by vast majority of different - myths determined - groups. *It seems that **interaction** with other small organized barbarian groups starts civilization. On the other hand, it also seems that interaction of **large number of different** organized groups creates barbarianism.*
Can this be compared with Hoking and creative and destructive interference of particles. How than can they be ever separated and isolated?

Finally, it seems that core problem is the *idea of difference* i.e. lack of acceptance that anyone can and should be different. However, *the idea of specificity* gets its full notion only in the crisis times i.e. it needs contexts in which will be "meaningful". Those are almost always turning points in society's and civilization's history and they are mainly economic by nature (hunger).

Evolution of dichotomy

What makes connection among civilization, barbarianism, economy and terrorism? Is there a correlation?

Hofman basically divides terrorism on nationalistic and religiously motivated. It seems that the idea of pureness can be recognized here. Moreover, direct connection with European invention is also being recognized. This is even dough ideological terrorism is European invention. Finally, it may be observed that all four terms are based on *relations*, on *interference*.

Even dough terrorism is not directly related with bad economic conditions - it cannot be connected only to the countries with the low life quality - it definitely has economic dimension. Firstly, terrorism requires finances and that makes its economic dimension indisputable. And this may be the key ration within respective notions pair mainly because of double produced damage. Secondly, terrorism's goals are mainly civilian i.e. economic targets including individual lives. Each one of them

has own economic value. Besides dimension of counter terrorism fight economic value is also not neglectable. Observed together prices of terrorism and prices of counter terrorism also represent important ration in respective pair's context.

However, it is quite important in which economic, political and civic context terrorism is being created.

Four basic relations seem possible. *First,* European innovation in barbarianism - as Morin claims - has been creation of nation-state and religious intolerance (for example prior Roman Empire had been religiously tolerant up to certain extent). In the same time, that was civilization change significantly different comparing to the previous forms such were city-states and empires. Numerous totalitarian regimes as well as two world wars rose on that idea. In the almost same time, at the down of French revolution first terrorist - *with the aim of changing conditions by violence* - movements had been created. Therefore, the root of terrorism is in Europe. That frankly was quite different terrorism than it is today in the context of actions goals. *Second,* terrorism as barbarianism means intolerance towards different. It is less important whether it is about class, religion, nation, ideology, crime or something else. Motive has always been difference and lack of integration. It means that terrorism is always directed towards "us" *the different ones*. *Third,* barbarianism and terrorism do not spare even non active ones in the "combat". Quite opposite from conventional warfare terrorism is being directed to the civilians (and fear production) and civilian means. Examples are numerous from Genghis Khan, Third Reich, conquering of Doclea in 1183, conquering of Montenegro in 1918 till bombing attacks of IRA, ETA, Al-Qaeda and other numerous terrorist groups but also soldier's acts in Afghanistan over the innocent population. That is the exact difference to the revolutionary terrorism's roots in Europe. Fourth, religious and nationalistic terrorism represent dominant forms of 21st century's terrorism (Hofman). Didn't the almost all forms of barbarianism rise on the idea of nation and *pure religion*? Finally, *manifestation of terrorism and barbarianism are not ideas and ideologies rather acts* as event the most shine idea is being observed through *acts.*

However, there is another - typical European - dimension of the problem and indirect connection of barbarianism and terrorism. The causes and in particular the acts of terrorist "achievements" have been quite neglected. They have been covered by silence and usually put into various contexts. It seems that mainstream forgets that in particular context almost each act can be *justified.* Nevertheless, there are unchangeable borders of good and bad and according to that what has to be judged regardless the origin of the actor. And Europe like it forgives and that forgets itself. And even if that form of forgiveness - due to partial Christian heritage of Europe - can be understand it definitely remains unclear why Europe forgets? Why is does not

talk about psychology myth inherited from Old East and in particular Hellenic civilization? Why it does not talk about dark part of European values pair? Why it does not talk about unplanned consequences of revolution? Why it does not speak about European terrorism of 20th century? Forgetting and lack of analysis are quite secure path to the *repetition of the scenario*.

Additional connection between economy and terrorism can be identified in the framework of the *root and context* not necessarily *cause*. Simultaneously, this relation is being non separable from connection with civilization and barbarianism. Numerous authors (Kruger and Maleckova 2003, Berrebi 2003, Abadi 2003, Kruger and Laitin 2007, Dreher and Gasenber 2007 and etc.) do not identify economic causes of terrorism. Quite opposite view is Derin-Gure's (2009) where relation of these two notions has been identified.

Nevertheless, the authors that have concluded that there is no relation between terrorism and economy mainly dealt with the economically caused terrorism. Precisely, whether terrorism occurs faster and simpler in undeveloped countries? The neglecting issue has been another pair of terrorism-economy ration which is making profits for the terrorism financing. Other issue that has been overseen is exclusive observation of nation-states and its parts as conditions for occurrence of economically caused terrorism. Nevertheless, hunger motivates individuals. Therefore, it is not possible to claim that *hungry individual* in economically developed system will not be potential terrorist. Of course, this is due to the fall under hunger-ideology pair's pressure. The key question is about what kind of terrorism do we talk about? Where it has been caused and what is its' goal?

Further, in order to make difference from early papers, Pinar-Gure makes difference between domestic, international and separatist terrorism. Pinar-Gure considers that domestic terrorism do not occur particularly in poor countries. However, concludes that it decreases in them as countries grew economically. In addition, considers that international terrorism affects richer countries more. This is at least due to the two causes. In prosperous countries psychological effects and economic expenditures of terrorist acts are significantly higher. And despite of the core belief the value of grey economy i.e. black market is significantly higher in them as well. Assuming that - despite the unknown methodology - grey economy value in the US is 8% it means that absolute value of that *economic sector* is USD 1,2 billion in 2011.

Observing additional relation, Pinar-Gure considers lack of civil liberties as the cause of terrorism occurrence. In other word, it occurs in systems with such values. It seems that Morin is also right about the present. Lack of civil liberties also means lack of acceptance of differences and basic individual's rights. From there to the

totalitarian system (even dough majority of them are already like that) and modern age barbarianism is a *tiny insignificant* step.

Tracing Morin again Pinar-Gure considers that severe incidents are also present in the cases of common border between *country-of-origin* and *country-of-goal* and in particular in the cases of former colonial relations. And here is one of the core relations of history and evolution of civilization of barbarism with economy. Parts of the former colonies apparently still observe former colonists as conquerors. And besides that due to the tribal mythology they are seeking paths of revenge.

In Pinar-Gure's research is quite indicative that relation between ethnic fragmentation and terrorism has been spotted. Pinar-Gure considers that in ethnic diversity situations which has not been followed by fragmentation of individuals there is no terrorist action of domestic inhabitants. However, remains unclear what is the condition of economy and civil liberties in such systems. Intuitively it can be assumed that those systems cultivates tolerance regardless the level of civil liberties development.[113] On the contrary, ethnic fragmentation inspires and stimulates existence of terrorist activities.

It seems that assembly of relations has evolved and that now comprehends intolerance, civilians as its aims, economic context, political-civil context as well as economic and ideological hunger.

Problem(s) of Today?

In recent past differentiation of terrorist and criminal organization was quite solid and stable. Terrorist groups have had politics, ideology, ethnic and/or religious intolerance as its motive. Terrorism has been perceived as *form of political violence and creation of psychological fear directed towards civilians and economic aims.* On the other side, criminal groups have had *profit* as its motive. Nevertheless, nowadays those groups have fusion themselves into so called criminal-terrorist groups (Liang 2011). It is indicative - according to Liang - that more and more terrorist groups are being involved in criminal activities while criminal groups become engaged in different forms of political violence. It seems that *justification* for terrorist groups the core price of their involvement as they must find funding sources for its activities. The most common manner for achieving that is through drug trafficking. Due to that this form of activities is being identified as Narcoterrorism, narcoguerilla and narcofundamentalism (Felbab-Braun, 2005; Liang 2011). The crucial question is what it the motive for criminal groups to become

[113] In the cases of either domestic or international terrorism the research shows origin from the modest civic liberties systems. It seems that precisely civic liberties must be significantly developed in order to influence the causes of terrorism.

involved in forms of political violence. And again it may be considered that it is all about needs for hunger and power and in particular the ways of achieving that power.

Liang is stating not so recent examples of connection of or transfer from terrorism into organized crime. In 1980 FARC (Revolutionary Armed Forces of Columbia) began with drug trafficking in order to finance own terrorism activities. Not so long after that criminal activities became even more important as in turnover as in volume context for FARC (Liang).[114] Second Columbian example is relation of Medellin narco cartel with 19th April Movement which dates from 1985. Quite similar has been behavior of Mexican cartels even since 1980. Cartels such are Huares and Los Zetas have been declared as terrorist movements due to application of terrorist techniques. Consequential, U.S. put seven Columbian cartels on the list of foreign terrorist organizations in 2011. At the beginning of the nineties Sicilian Cosa Nostra has started series of bomb attack starting at the Uffizi Museum in Florence (Makarenko, 2004) as retaliation for their leaders arresting. It will pursuit the same tactics fighting Italian policy and prosecution and with perhaps the most *famous* attack of judge Falcone (and also judge Borsalino).[115] Exactly the Italian example shows how terrorist acts and manners of behavior can be applied in the world of crime in order to achieve significant political power. Something similar has been repeated at the Balkans. Second large Italian criminal organization Camora from Naples has relations with Al-Qaeda (Liang, 2004). It is being considered (Chepesiuk, 2010) that their members have been transported into Europe through the network of Camora. The key terrorist organization of today - Al-Qaeda - is a network of decentralized terrorist "cells", franchises and associates doing criminal activities (Liang, 2004). At least three Al-Qaeda's *organizations*: Al-Qaeda in Iraq (AQI), Al-Qaeda in Islam Magreb (AQIM) and Al-Shabab are dealing with globally dispersed criminal activities. Those activities comprehends drugs, trafficking, kidnapping, smuggling, *blood diamonds* turnover as well as taxation of Somali pirate's and then direct involvement into piracy (Al-Shabab - "the sea jihad": Childress, 2010).

The key factors for the existence of respective relations - according to Liang - are globalization, Internet and communications revolution, the end of the Cold War and global war against terrorism. Liang "blames" globalization because of freedom of doing business and freedom of movement that cause that crime and terrorism can be done anywhere. Internet is blamed due to *lack of control*, dissemination of messages

[114] FARC and ELN (National Liberation Army) control 40% of Columbian territory and are active participants in billions worth turnover of narcotics (Liang, 2004). It is being estimated that annual revenue of FARC is USD 400 million.

[115] Giovanni Falcone (1939–1992) and Paolo Borsalino (1940-1992) were Italian i.e. Sicilian judges and the most important figures of anti-mafia campaign and prosecutions in Sicily.

and fundraising and activists raising. She blames the end of Cold War because of *disappearance* of state-sponsored terrorism and need of finding new funding sources through crime. At the end, the core *global counter terrorism war* (including Bush's Patriot Act) influenced financing of terrorist groups and their even more intensive cooperation with the crime. Here Liang is quite close to Loretta Napoleoni's stand view and her critics' of globalization. Nevertheless, even globalization factors have negative elements it seems that Benjamin said unbeatable truth that *there is no element of civilization which is not in the same time barbarian act.*

Respective factor analysis should not force conclusion that aforementioned flux of crime and terrorism would not exist if there is no globalization. As well as it was or it is its *ideal* opponent nation-state (that had been the source once upon a time). Simple, in the era of changes and creation of new paradigms surface births *mythological* guided individual's acts. It seems that precisely the fight against them will have to be at the level of strategic alliances of individuals, states, regions, systems, non-state actors and supranational institutions which are supposed to strengthen.

This especially states for *future conventional form* of war - virtual space. Specificity is being derived at least due to the facts that it has not been created or controlled by states. Today the cyber space represents *place* on which criminal activities happen. They comprehend identity thefts, video piracy, credit card frauds, social insurance frauds, so called "fishing" (regardless they are false conference invitation with false web site or false hotel reservations) etc. cyber space is being used also for dissemination of ideas about targets, execution techniques, bomb creation techniques, propaganda, recruitment as well as trade of all illegal goods and services.

Challenge(s) of the Future?

The key challenges of the future are the ways of response to current problems regarding intersection of organized crime and terrorism as well as their evolution in the cyber space.

It seems that cyber space will be even more significant in the approaching time. *Problem* with the cyber space is that it cannot be controlled either by state or any other dominant military force. Exactly due to dispersion but also decrease of nation-state power come or will come to the higher (mal)usage of the cyber space as for economic espionage, virtual war, cyber crime and cyber terrorism. The current division on state and non-state actors is losing its meaning due to the existing tendency that all aforementioned activities can also be undertaken by non-state actors. Their *anonymity* and distance can be obstacles in defense attempts. Future

cyber sophistication of international terrorism and crime - as in expert knowledge as in financial frauds- is what is expected to be the next definite challenge.

It is also important to emphasize that dangers to the society have never been higher at least in developed countries. Availability and penetration of Internet make citizens quite vulnerable as in context of frauds, identity thefts, card frauds as in ideological influences on younger population and creation of new *ready* followers of terrorism and organized crime. In the same time, the same citizens are against limitation of individual freedoms. It seems that exactly that ratio pair *counter terrorism vs. personal freedom protection* will be in centre of all upcoming processes.

Just as the development of previous civilizations technological progress lead it to the dangers of barbarianism. Internet and power of communication and *erased* borders are essential but definitely not the only dangers. Even dough they can be complementary to the other dangers such are proliferation of WMD (weapons of mass destruction), Internet, biological and chemical viruses, energy and food safety issues but also many currently unknown problems of the future.

Worries must enhance also the issue of *origin* of today the most active terrorist groups.[116] Mainly it is about nation-states that: (i) have significant influence of tribal-mythological factors, (ii) have unsolved ideological-religious-tribal conflicts, (iii) have significant growth of population in world terms, (iv) belong to the assembly of so called *failed states* in which exist minimal degree of political and economic freedoms - if exists at all -, (v) have quite poor economic conditions and (v) are extremely *fruitful* for planting and trade of narcotics due to territory, ethnic and economic conditions. Even dough Afghanistan is *par excellence* example of aforementioned elements as well as the biggest world opium produces and third population growth rate (3.85% annually by UN) there is quite similar states.

The important problem is population growth and especially *location* of population's growth. It is worrying that among five top populations growing states are those that have significant problems and whose population can be extremely *usable* for future terrorist activities.[117] Precisely in that context it must be observed potential solution for that state's part of global theatre. It definitely demands joint action of global stakeholders.

It is obvious that counter terrorism and organized crime is too large individual problem even for the most powerful states in the world. Happenings of 9/11 and start of *global counter terrorism war* are sufficient confirmation of that. Additional

[116] Not necessarily ethnic as origin of dealing with such activities.
[117] Liberia, Burundi, Afghanistan, West Sahara and East Timor with annual population growth rate of 4.5; 3.9; 3.85; 3.72 and 3.5; respectively according to the UN.

confirmation is in what Liang identifies as factors of that flux's creation mainly in globalization. If the thesis of globalizations *contribution* for that is being accepted than searching for answers on how to use the same for counter terrorism fight has to follow. What would be the suitable global infrastructure for adequate response to those challenges? Whether Morin is right when he considers that Europe may create new humanism and new renaissance and *export* them to the global stage (Ohmae)? It seems that idea behind the European Union (EU) can be idea for the certain part of the world. Regionalization can be significant weapon for counter terrorism especially in Asia but also in South America.

But is regional approach sufficient? EUISS and NIC consider that global management - identified as *collective management of common problems at the international level* - is in the crisis.[118] The key reason is that previous local conflicts have *simply been transferred* on the global stage. It seems that driver for conflict transfer is so far unseen *interdependence* of global stage actors. Financial and then sovereign debt crisis confirm that without any doubt. In addition interdependence is being intensified by growth of developing countries (mainly BRIC's but potentially CIVETS).[119] Growth of their power and involvement into world economy can cause also transfer of their own local problems into the global level.

Quite important aspects are also the problems that are produced by policies of *sovereign* nation-states. Stated problems are quite often making global problems solutions quite difficult. In the same time they start losing their power i.e. the same is dispersed on more *power owners*. This is exactly why it seems that supranational structure of global management (not global governance) should be the new 21st century's infrastructure.

The key challenge is how to create new supranational infrastructure of power and global governance? Which actors will be dealing with the global problems and whether the EU and China will prioritize current and potential internal problems?

EUISS and NIC give overview of four potential scenarios: (i) status quo - none crisis will be big enough and the systems will solve it ad hoc; (ii) fragmentation - regional powers will try to isolate own problems; (iii) making the 19th century idea of *Concert of Europe* alive and common solving of problems with new infrastructure and new power balance: U.S. will share the power, China and India will increase

[118] European Union Institute for Security Studies, US National Intelligence Council (2010): *Global Governance 2025: At a Critical Juncture*, s.13.

[119] BRIC: Brazil, Russia, India and China. CIVETS (estimation of the new fast growing economies done by The Economist): Columbia, Indonesia, Vietnam, Egypt, Turkey and South Africa. Regardless the accuracy of estimation respective countries do have significant volume of unsolved problems.

financial contribution in joint projects while the EU will take more global role that until now; (iv) prevailing of the conflicts - internal conflicts in Asia and Middle East and clash of U.S. and China.[120]

Instead of Conclusion

Whether due to the *origin* or *ideology* EUISS and NIC believe that - even less probable in the near future - third scenario best in the long term. Revival of *Concert of Europe* i.e. of potential future *Concert of World* is - at least it seems to be - on the path of Morin's thinking's.[121] Morin considers that Europe will become (or even remain) the laboratory and creator of new humanisms and renaissance ideas and that in the future it will *export* it own culture (not the barbarianism).

However, it is not question can Europe do it rather *how* is it achievable? It seems that significant contribution will be given (or they already have some) also the so called *non state actors* i.e. that they can be either element of cooperation or clash deepening. Currently non state actors as elements of clash do have advantage as they comprehend criminal and terrorist group and tend to conquering and political power strengthening. However, the potential *solution of the problem* is inclusion of politically powerful non state actors that are positive product of globalization and that already have economic and political power. As positive non state actors transnational or supranational non-governmental and inter-governmental organizations, multinational companies, different business organizations, interest groups and etc can be identified. Even if they have been considered as positive non state actors which can have positive influence on changes and cooperation, churches and various religious organizations do have long history of intolerance and therefore can be deeply problematic actors. However, their power of *governing* the people can be taken seriously into account and should be directed towards desirable direction. Even dough civil society is being emphasized as positive form of non state actors it is forgotten to differentiate especially *universities*. It seems that exactly this can be on Morin's path as exactly the educated people of *encyclopedic spirit* created and developed ideas of European humanism and renaissance.[122] And maybe there can be traced second European i.e. global humanism and renaissance within *Laboratory Europe* (Morin). The key idea of new global humanism should be oriented towards the development of ideas of freedom, tolerance and thinking about barbarianism and

[120] Frankly, authors have the smallest belief in the fourth scenario but they do not exclude it.

[121] Concert Europe (also known as Congress system) represented form of power balance in Europe between 1814/5 and 1914 (hundred year period). Austria, Prussia, Russia, United Kingdom and France (involved later) had been involved into this system.

[122] Morin,2006.

terrorism. It is possible that might the *right direction* for freedom of individual(s) through *creative interference of particles*.

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Milica Dakovic*

Demography and Energy

Abstract: *Is there any correlation between demographic changes and energy intensity? What influences energy demand? Are changes in the number of population affected by the change in demand for energy? How demand for energy affects the economic growth and living standards? Demand for energy is represented by the amount of energy produced. How rise in income and GDP affect energy consumption? Why there are controversy related to definition of relation between demography and energy? How to define main causes and influences?*

Key words: *demography, population, energy, energy intensity*

1. Introduction

Demand for energy is measured by the amount of produced energy. What causes energy demand? Is there a link between demographic changes and energy use? Do changes in number of population cause changes in demand for energy? How energy demand affects economic growth and life standard? How increase of income and GDP influence energy consumption? Why there are opposite views in terms of relation between demography and energy? What is common for both issues? Where's a cause-and-effect relationship?

In addition to the general definition that energy in XXI century is becoming a limited resource and that we should seek for some alternative ways of energy production, energy use is not just determined by scarcity of resources. There are also some other issues that have direct impact on quantities of produced and consumed energy on the global level. One of them is demography. These seemingly different issues have strong connections and causality which is present in economically developed and developing countries as well.

Demographic changes are defined through changes in number of population and population habits, changes in income and GDP which has direct impact on energy use and demand. A relationship between these two issues can be presented by energy intensity which represents a link between demography and energy. Following text will try to provide answer on a key question – Is change in energy intensity a key characteristic of developed or developing economy?

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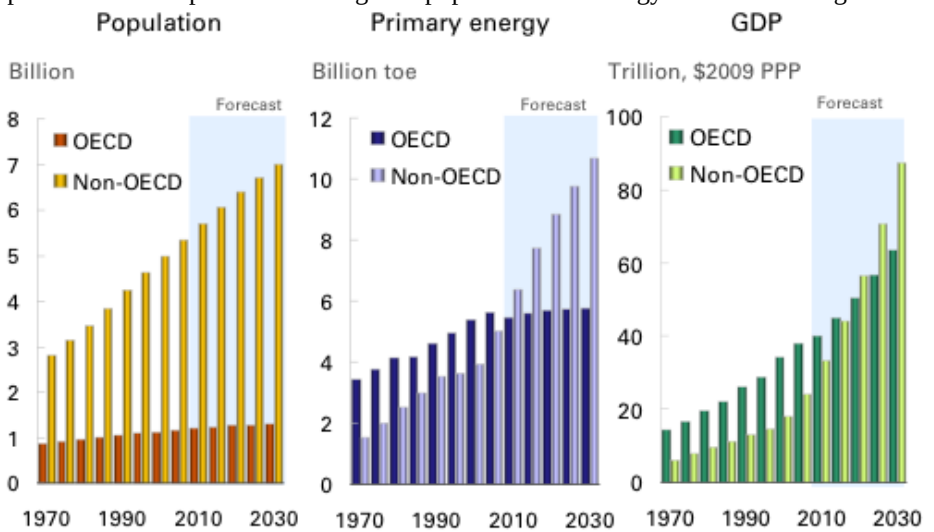
2. Demographics and energy on a global scale

Demographic trends and fluctuations in the number of world population as well as fluctuations in global income are recognized as two key factors that affect energy demand on the global level. According to statistics since 1900 global population nearly quadrupled, real income increased 25 times while primary energy consumption increased 22.5 times in observed period.

Moreover during the last twenty years world population increased by 1.6 billion people while projections indicate that in next twenty years global population will increase for 1.4 billion people. On the other hand, in the last twenty years global income increased 87% while in the next twenty years it is going to increase for 100%. All presented statistics are showing that there will be an increase of population with high income on the global level which will consequently cause negative effects on demand for energy. Namely, the forecasts indicate that we can expect increase in demand for energy which indicates the need for higher energy production and consumption in the future.

Graph 1: Relationship between changes in population and energy demand on the global level



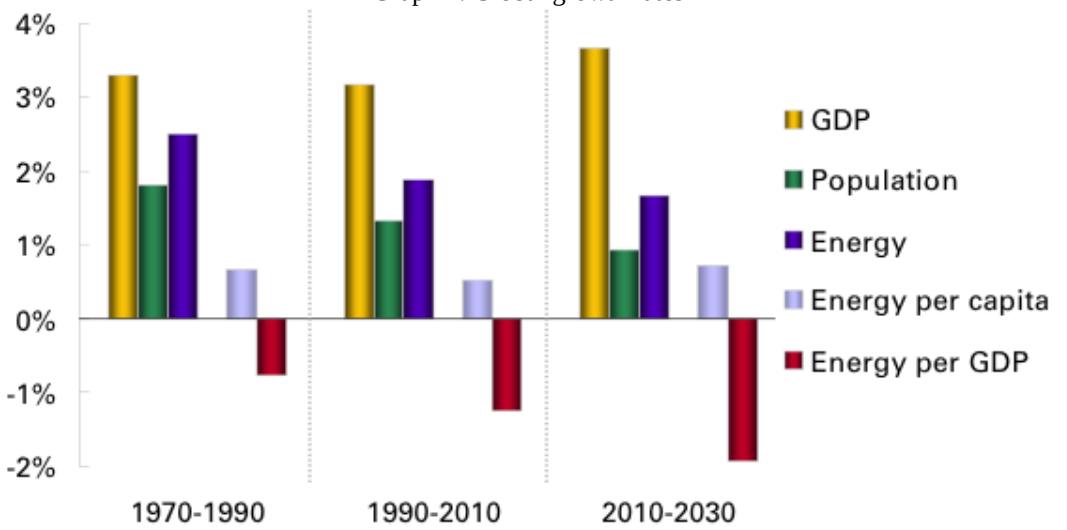
Source: Energy Outlook 2030

Expected trends in the energy sector are showing that the global economy will continue to develop on the basis of post-industrialization, urbanization and its orientation towards new technologies. These trends will be followed by:

- The increase in energy consumption on the global level;
- The increase of energy usage, production and consumption;
- A diversification of energy resources;

- An increase in green energy demand (renewable energy.

Graph 2: Global growth rates



Source: Energy Outlook 2030

Even though projections of population growth on the global level are showing an increase in energy consumption it's worth mentioning that a global paradigm towards energy is changing towards the fact that energy is becoming a limited resource and that existing resources should be replaced with alternative ways of energy production. According to that renewable energy sources are recognized as key alternative ways in energy production followed by other ways of 'green energy' which are going to compensate decreasing trends and limitations of current energy resources.

3. Demographics and energy – where's the link?

In order to define a link between a size of population and increase in demand for energy it is important to point out a key link between two issues. The first link can be defined in the level of economic development which can be presented by macroeconomic indicators like the general income or GDP per capita. In general, higher GDP means greater energy consumption per capita. According to that it is important to compare developing economies with highly developed ones.

Namely, average GDP and energy consumption per capita in developed countries represents just 1/7 or 1/8 those achieved in developed economies (Darmsadter, 2004). If we take into consideration that number of developing economies represent one third of the total number of countries in the world it can be concluded that

absolute energy consumption is on relatively high level and represents one third of total global energy consumption.

Even though there's a correlation between achieved income and produced and consumed energy, energy consumption is different in each country and is depending on key specifics of each economy, climate, energy resources, policies and strategies related to it. This means that changes in income per capita do not necessarily need to be proportional to energy consumption per capita.

Changes in energy consumption are based on three different factors: number of population, GDP per capita and energy consumption per GDP unit.

Energy = Population + GDP per capita + Energy consumption per GDP unit

Historically, in nineties economic growth is measured by increased number of population as a key indicator of energy consumption in economically developed or developing countries. On the other hand, during the last ten years there were some changes in defining a link between demographic changes on one side and energy consumption on the other side. A paradigm slightly changed on the way that increasing demand for energy will be defined as a consequence of increase of income per capita rather than increase in number of population.

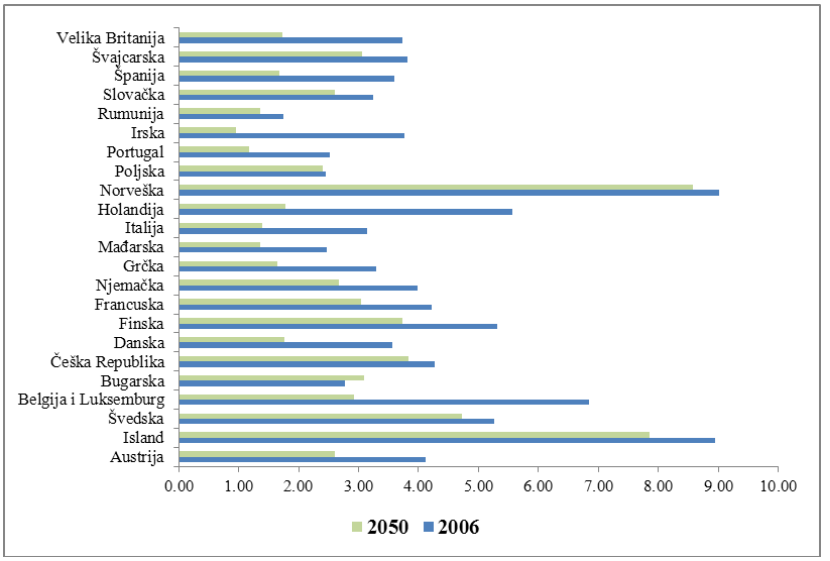
UN projections are showing that world population is going to increase from 6 billion in 2000 to 9.3 billion people till 2050 which represents 0.8% growth rate and shows a decrease if we compare it with growth rates in period 1950-2000 which were on the level 1.7% (United Nations, 2000). If we take into consideration that GDP on the global level will increase on 2.5% growth rate till 2050 this means that paradigm shift in energy together with raising awareness of scarcity of energy resources will cause 1.3% growth rates in energy consumption (Darmsadter, 2004).

4. Energy intensity

A relationship between demographic changes and need for energy can be presented by the indicator of 'energy intensity' which represents a percentage share of energy consumption in GDP. Additionally, it represents an indicator which measures energy efficiency in one economy. This indicator is changing depending on level of economic development and is the highest in those countries which are passing or still in the process of industrialization.

Increases in energy efficiency are causing decreasing of energy intensity indicator together with increasing competitiveness and liberalization of global energy market.

Graph 3: Energy intensity per capita in Europe in Energetska intenzivnost po glavi stanovnika u Evropi, 2006 and projections for 2050



Source: Chefurka, 2007.
Note: Values defined with 'TOE' (tone oil equivalent)

Countries which are achieving higher GDP per capita have a tendency to save or increase its level of energy intensity on the way to save it from potential negative effects caused by fall in energy stocks.

On the other hand, countries with relatively lower GDP per capita have a tendency to increase a need for production of additional quantities of energy even though it will not have an influence on GDP. On that way countries with lower GDP per capita are becoming more vulnerable if they face with fall in energy stocks in the future.

Table 1: Twenty richest and poorest countries based on a GDP

20 richest countries				20 poorest countries			
2006 (GDP)		2050 (projections GDP)		2006 (GDP)		2050 (projections GDP)	
Norway	$46.435	Norway	$58.929	Belarus	$8.551	Peru	$3.012
Ireland	$44.073	Ireland	$58.102	Columbia	$8.432	India	$2.074
USA	$43.607	USA	$39.022	Turkmenistan	$8.400	Malaysia	$2.009
Iceland	$37.682	Iceland	$36.460	China	$8.094	Thailand	$1.997
Hong Kong	$36.971	Hong Kong	$35.921	Ukraine	$7.868	Ecuador	$1.704
Denmark	$36.636	Denmark	$35.576	Algeria	$7.508	Kuwait	$1.646
Canada	$35.269	Canada	$34.103	Azerbaijan	$7.373	Venezuela	$1.644
Austria	$34.610	Austria	$33.920	Venezuela	$7.165	Turkmenistan	$1.587
Finland	$33.923	Finland	$29.591	Peru	$6.502	Philippine	$1.558
Switzerland	$33.618	Switzerland	$27.371	Middle East	$5.871	Algeria	$1.296
Japan	$33.069	Japan	$26.193	Central and Southern America	$5.185	Central and Southern America	$1.292
Australia	$33.069	Australia	$24.641	Philippines	$4.940	Iran	$1.196
Sweden	$32.289	Sweden	$24.324	Ecuador	$4.458	Saudi Arabia	$1.102
Germany	$31.917	Germany	$23.940	Egypt	$4.164	Indonesia	$1.027
Netherlands	$31.873	Netherlands	$23.480	Indonesia	$4.040	Uzbekistan	$832
United Kingdom	$31.743	United Kingdom	$22.046	India	$3.678	Egypt	$799
Belgium and Luxembourg	$31.741	Belgium and Luxembourg	$21.998	Pakistan	$2.656	Middle East	$759
Singapore	$30.696	Singapore	$21.708	Bangladesh	$2.239	Pakistan	$659
France	$30.353	France	$20.843	Uzbekistan	$2.005	Africa	$473
Italy	$30,224	Italy	$19,288	Africa	$1.889	Bangladesh	$228

Source: Chefurka, 2007.

GDP projections for twenty poorest countries till 2050 are showing that their GDP is going to further decrease for 75% while the average income will decrease from 13.5$ per day on 3.28$ till 2050. If we analyze population in those countries and knowing that low income is a key characteristic it is showing that over 2 billion people will have 1$ or less than 1$ income per day in 2050 comparing with 1 billion people today (Chefurka, 2007).

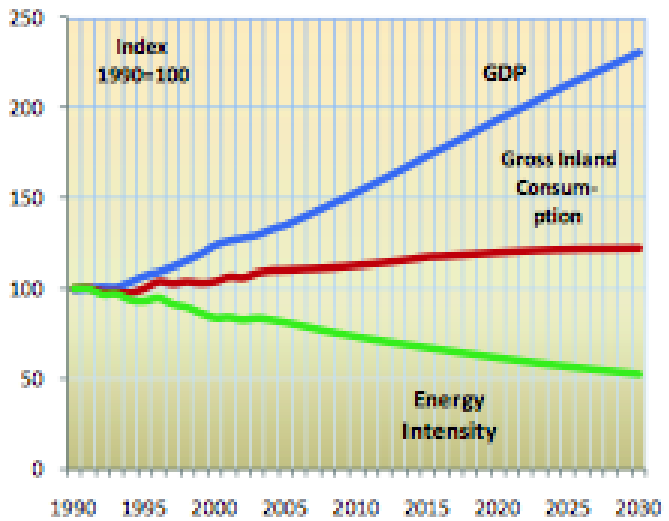
There are three factors recognized as the most important in defining economies as 'rich' or 'poor' in the future. One of them is defined through the resources. The other factor is related to demographic changes while the third factor is defined by the level of energy intensity.

Developed economies are simultaneously achieving all three effects: high level of GDP per capita, stability or slight decrease in number of population as well as a constant increase of energy intensity. This position allows to developed countries even a decrease in energy efficiency which will not have a negative influence on GDP. On the other hand, developing countries are facing with three interconnected risks.

Those economies are only relying on energy based on fossil fuels and are lacking alternative ways in energy production. Moreover, developing economies are facing with demographic changes, increases in number of population followed y high fertility rates. Key and most important risk is related to the level of energy intensity which represents additional barrier for their future economic prosperity.

There are some opposing views about energy intensity on the global level. Some of them are more oriented towards greater energy intensity, while some are not. Those projections are showing that energy consumption annual growth rates will be lower than economic growth rates which implies that if decrease in energy intensity happens it will cause changes in energy paradigm on the global level.

Graph 4: Energy intensity in Europe



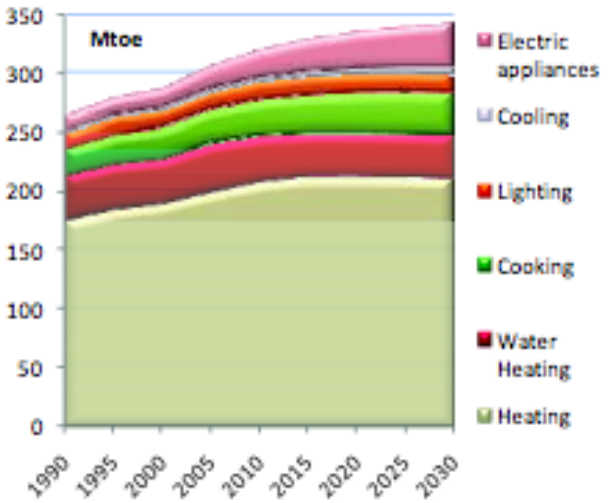
Source: Eurostat, 2012.

5. Demography and energy in Europe

Projections related to the number of population in EU27 till 2020 are showing relative stability in its growth and will reach 496.4 million people. On the other hand, projections related to new EU member countries are showing that those countries are facing with slight decline in population (7.2% between 2005 and 2030). In the context of defining demographic and energy demand movements it is important to emphasize that the household size and the number of household members are key factors that are determining energy demand. On the basis of UN projections average household in EU27 in 2005 had 2.4 household members, while the same indicator in 2030 will count 2.1 household members.

Key reasons for such decline are related to expected life duration combined with population growth rates and changes in economic and social aspects of life. However, even though it can be expected decrease in number of household members on the other side it can be expected increase in number of households in EU27 and it derives as a consequence of direct impact of energy intensity in Europe. Namely, increase in number of households in Europe will cause increase in energy demand within the population.

Graph 5: Energy consumption in households in EU



Source: European Commission, 2008

However, economic theories are showing that increased purchasing power is a key driver for higher energy consumption rates in households, by changing their consumption habits. On the other hand, purchasing power is a key factor that is changing household consumption habits in EU27 on the way that they rely more in energy efficiency and new technologies. Improvements in energy efficiency are introducing new standards which have an impact on the energy consumption of the households in EU27. Changes in the field of energy efficient solutions are visible while demand for energy is determined by the increase in the number of households in EU27 (European Commission, 2008).

Instead of conclusion

Demographic changes as well as changes in the realized income are determining the demand for energy in the future, on the global level. One of the key characteristics of demographic changes are related to increase in number of population in less developed economies as well as increase of income in developed countries. Moreover, Europe is facing with stagnation in the number of its population and increase in number of households.

Those trends are showing an increase in energy demand which is present through high energy intensity rates. On the other hand, fluctuations in number of population do not determine energy intensity. Energy intensity is more influenced by income per capita. In order to decrease a level of energy intensity, energy efficiency is recognized as a key factor that can decrease burdens on existing resources by changing the energy paradigm and introducing alternative ways of energy production.

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Change in Population and Sustainable Development

Abstract: *The main topic of this paper is the consideration of the necessity of exercising the so-called sustainable development, a new concept that has emerged in recent years in response to the challenges that cause many negative aspects of development of the existing type. Achieving sustainable development requires some fundamental changes. An important dimension of each development is the "human factor". Translated into the language of demographics it is population. The population is therefore important, or decisive factor for the development. Hence, demographic trends are imposed as a necessity in all studies that claim to reveal trends and regularities in the development.*

Key words: *demography, population, sustainable development, economic growth, resource*

Introduction

The human population grew slowly during the greater part of humanity. Only in the last 200 years, the population began to grow rapidly. After centuries of gradual growth the global population reached one billion people in 1800. One and a half century later it reached a figure of 2.5 billion people. Due to rapid population growth after the World War II, the population is doubled to 5 billion for less than 40 years. The population of the planet Earth amounted 6.55 billion in mid 2006. It is evident that each year the population increases by 76 million. In October 2011 UN[123] acknowledged little Danica Camacho born in the Philippines, as a baby with which the population of the Earth reached seven billion. Increased number of people requires provision of more energy, homes, food and employment, and creates more waste and pollution. How existing resources can be used more efficiently and take advantage of meeting the needs of not only the present inhabitants of the planet, but also those who come?

1. Theories of population growth

1. 1. Malthus model of population growth

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[123] http://www.un.org/en

In his famous book "An Essay on the Principle of Population"[124] published 1798th The Thomas Malthus (1766-1834), English economist, first investigated the important issues of population growth. His postulate was that people under certain circumstances can be reproduced by the enormous growth rates. The only which can limit it are the limited available resources, especially land. If less people live on certain territory, their well-being is higher. When the population begins to increase, the amount of available land is reduced per person, therefore people are getting poorer. The resulting poverty will, in turn, limit population growth, and if the people still wants to live in prosperity, they will have to achieve their income in constant proportion to population size.

According to Malthus, productivity growth is a factor that can make people richer, but more important it is a "moral restraint", which is the only way for people to prevent excessive childbearing and improve living standards.

The question is whether Malthus was right? Many people are rightly concerned that Malthus may have to be right on a global scale, and that the planet will not be able to feed nine billion people. Lester Brown, former head of the Institute of the Earth in Washington, argued that food shortages could lead to the collapse of global civilization. However, not all scientists share his opinion. Some of them think that our biggest problem is not only in population, but in the use of the Earth's resources. "Many people are wrong when they say that the problems are only in population," says Joel Coen. "It's not even the dominant factor. In order to stop global warming, we will have to move from fossil fuels to alternative energy sources, regardless of the size of the population."[125]

In other words, the number of people is important, but more important is how we treat planet's resources. It is even more significant in the U.S. and Western Europe. Scientists appeal to reduce the use of meat and driving automobiles. If we reduce eating meat and using our cars, we save our forests and air from pollution. It's far more important question of how to consume food and energy, instead of how many children we have.

1.2. The demographic transition

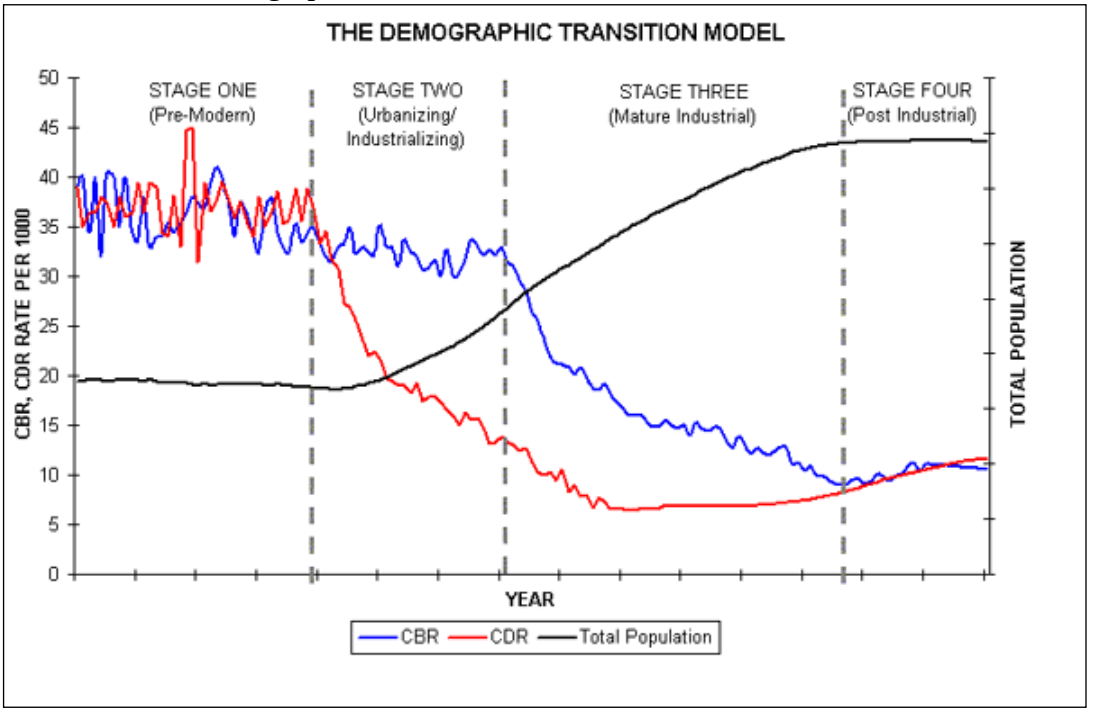
In contrast to Malthusian pessimistic projection and his followers in terms of future trends in ensuring enough food for the fast-growing population in the world, the

[124] Malthus, Thomas R. (1798), *An Essey on the Principle outitf population, as It Affects the future Improvement of Society with Remarks on the Speculations of Mr. Godwin*, M. Condorcet and other writhers. London: Printed for J. Johnson in St. Paul´s Church-Yard

[125] Cohen, Joel (1996), *How Many People Can the Earth Support?* New York: W. W. Norton. 532 pp, paperback

Theory of Demographic Transition apperared in the 1920s. The "Demographic Transition" is a model that describes population change over time. It is based on an interpretation that begun in 1929 by the American demographer Warren Thompson, who observed changes, or transitions, in birth and death rates in industrialized societies over the past two hundred years. "Model" means that it is an idealized, composite picture of population change in these countries. The model is a generalization that applies to these countries as a group and may not accurately describe all individual cases.

There are four stages of transition. They will be described first in terms of a typical fully developed country today, such as The United States or Canada, the countries of Europe, or similar societies elsewhere (e.g. Japan, Australia etc.).
Picture 1: The Demographic Transition[126]



Source: http://epp.eurostat.ec.europa.eu/

- In stage one (pre-industrial society), death rates and birth rates are high and roughly in balance. All human populations are believed to have had this balance until the late 18th century, when this balance ended in Western Europe. In fact, growth rates were less than 0.05% at least since the Agricultural Revolution over 10,000 years ago. Birth and death rates both

[126]CBR: The Crude Birth Rate represents births in a given year for every 1000 persons.
CDR: The Crude Death Rate represents deaths in a given year per 1000 people.

tend to be very high in this stage. Because both rates are approximately in balance, population growth is typically very slow in stage one.

- In stage two (early industrial society), the death rates drop rapidly due to improvements in food supply and sanitation, which increase life spans and reduce disease. The improvements specific to food supply typically include selective breeding and crop rotation and farming techniques. Other improvements generally include access to technology, basic healthcare, and education. For example, numerous improvements in public health reduce mortality, especially childhood mortality. Prior to the mid-20th century, these improvements in public health were primarily in the areas of food handling, water supply, sewage, and personal hygiene. Interestingly, one of the variables often cited, is the increase in female literacy combined with public health education programs which emerged in the late 19th and early 20th centuries. In Europe, the death rate decline started in the late 18th century in Northwestern Europe and spread to the south and east over approximately the next 100 years. Without a corresponding fall in birth rates this produces an imbalance, and the countries in this stage experience a large increase in population.
- In stage three (late industrial society) birth rates fall due to access to contraception, increases in wages, urbanization, a reduction in subsistence agriculture, an increase in the status and education of women, a reduction in the value of children's work, an increase in parental investment in the education of children and other social changes. The birth rate decline in developed countries started in the late 19th century in Northern Europe. While improvements in contraception do play a role in birth rate decline, it should be noted that contraceptives were not generally available or widely used in the 19th century and as a result likely did not play a significant role in the decline. It is important to note that birth rate decline is caused also by a transition in values; not just because of the availability of contraceptives.
- During stage four (post-industrial society) there are both low birth rates and low death rates. Birth rates may drop below replacement level as has happened in countries like Germany, Italy, and Japan, leading to a shrinking population, which represents a threat to many industries that rely on population growth. It creates an economic burden on the shrinking working population. Death rates may remain consistently low or increase slightly due to increases in lifestyle diseases due to low exercise levels and high obesity and an aging population in developed countries.

As with all models, this is an idealized picture of population change in these countries. The model is a generalization that applies to these countries as a group and may not accurately describe all individual cases. The extent to which it applies to less-developed societies today remains to be seen. Many countries such as China,

Brazil and Thailand have passed through the Demographic Transition Model (DTM) very quickly due to fast social and economic change. Some countries, particularly African countries, appear to be stalled in the second stage due to stagnant development and the effect of AIDS.

Criticism of the theory of demographic transition largely relies on the fact that the theory grew from the experience of Western countries and is applied to the rest of the world, and thus, a society that is very different from those in Western Europe. The fact that is indisputable is that there are still demographic changes in developing countries which take place much faster than at the time when they went through the changes of today's developed countries. Therefore, it raises the question of adequacy of this theory in explaining changes in the population of the world in space and time.

2. Population and economic growth

Population growth does not happen at a random rate worldwide. The centers of population are becoming denser. Number of people living in cities for the past forty years has doubled. Sixteen cities numbered more than a million inhabitants in 1990.[127] In 2000, the three hundred and twenty-six cities numbered more than a million, and fourteen cities over ten million people. Population increase at higher rates occurs in less developed countries. According to the United Nations, countries that are among the top ten, ranked by population and compared with the projected population 2050th year are as follows:

Table 1: The ten most populated countries in the world

Country	Population, 2005 (in millions)	The annual growth rate, %	Projected population, 2050 (in millions)
China	1 304	0,6	1 437
India	1 104	1,4	1 628
USA	296	0,6	420
Indonesia	222	1,4	308
Brazil	184	1,0	260
Pakistan	162	2,0	295
Bangladesh	144	2,1	231
Russia	143	0,4	119
Nigeria	132	2,4	258
Japan	127	0,0	101

Source: http://www.un.org/en

[127] Gretchen C. Daily, Anne H. Ehrlich and Paul R. Ehrlich, „Optimum Human Population Size“

Many major global economic, social and environmental problems resulting from increasing human population pressure on limited natural resources. Rapidly increasing population, especially in the last two centuries, this pressure has escalated dramatically. This distortion is the result of three mega trends: (1) growth in population and urbanization, (2) the growth of industrial output and other related outputs and (3) increasing demand for material well-being.
Countries differ in the number of population and growth rates. Countries can have a slow rate of population growth and large population in terms of resources, and conversely, rapid population growth and a small population relative to resources.[128]
Between income per capita and population growth rate is a strong negative correlation. But while there is a negative correlation statistically easy to spot, it is difficult to explain in life and understand. For example, in some countries, rapid population growth is the main reason for their poverty, poverty in other countries encourages rapid population growth in third countries the both occurs. There are countries where population growth and per capita income are in mutual relation, and there are countries where a totally different factors influence the growth of population and income per capita. Problems concerning the relationships between population and economic growth are very comprehensive and complex.

3. Population and Sustainable Development

Sustainable development means that the Earth's natural resources must not be used faster than the planet can renew. It means "treat the Earth as we really intend to stay on it."
The population and population density, but also the uses of resources are not equally distributed across the globe. Industrial countries use more natural resources from less developed countries. More generally, the wealthiest one billion people consume eighty percent of the world's resources, leaving the other five billion people to share the remaining twenty percent. Sustainable development is crucial for the poorest countries in the world.

Is the growing population is good or bad thing for the country as a whole? If the state has an abundance of resources, state leaders will support it. The high supply of labor encourages the rapid economic growth and helps to better utilization of unused resources and new technologies. However, this period of rapid economic growth and population growth probably contains factors and self-restraint.

[128] Japan and Kenya are two typical examples. In the period since 1960. and 2000. The Japanese population is growing at an annual rate of only 0.8%, but the population density in 2000 was one of the largest in the world: 131 people per km ². In the same period the Kenyan population grew at a rate of 3.3%, while the population density in 2000 was 20 people per km ².

One such factor is the improvement of social conditions that are usually accompanied by economic growth. This development, which is not automatical, often in itself, requires a tough battle for social and economic reforms. Finally, the state still has to make social changes that are characteristic of developed countries, including the laws on child labor, unemployment benefits, social security system, private pension plans, ensure greater educational opportunities.
In such an altered environment, there is a change of the attitude of people towards family size. Smaller families became more favourable - large families become economic burdens rather than benefits, and how the family reduces the opportunities arise, particularly for women. Very often fertility rates[129] decline rapidly, because of all these reasons. Time is entering a phase of declining birth rates and lower rates of net population growth. (stage III). During the period of birth rates decline, populations can double or triple. However, only when the birth rate continues to decline, the state will finally enter the final phase of stabilized population with low birth rates and mortality (stage IV).

Throughout the history of Europe, this process has been "relatively painless". Despite the difficulties that were present in the initial phase, population growth, economic growth and overall social progress went hand in hand. Maltusisan vision can not happen - in fact; larger populations are generally led to better living conditions.
Does this picture agree with the current realities of global population? The first two phases of demographic transition theory is definitely applicable to developing countries in the second half of the twentieth century. Mortality rates have fallen faster than birth rates, fertility rates and population growth reached a historical maximum in the period between 1950 and1975. Since then, strong evidence suggests that most countries entered the third phase, with decline of overall growth rates. But the present experience of developing countries like Montenegro and the countries of the region are in many ways different from the experience of Europe.

- Every decade, developing countries add population that is equal to the entire population of Europe and Russia.
- During periods of its expansion, Europe and the U.S. have soaked stocks of natural resources from the rest of the world. Currently, developed countries disproportionately draw global absorptive capacity of the environment.

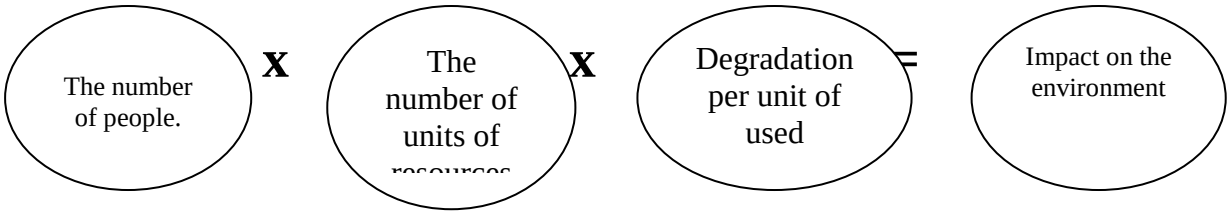
[129] Fertility is effectively births within the group of women in childbirth. The general fertility rate (f) indicates the number of live births per 1,000 women of fertile period. Calculated as the ratio of live births in one year and the number of fertile women ($V_{f,15-49}$).

$$f = \frac{N}{V_{f,15-49}} \cdot 1000$$

- There is considerable uncertainty about the role of declining fertility. Factors contributing to the decline in fertility may exist in some countries and in others not. Predictions about population stabilization strongly relies on the rapidly declining feritlity, which may or may not happen.
- Rapid economic growth that accompanied the population growth in Europe emerged in some developing countries, while in others not. Where there was a strong economics, growth, its use is not spilled on the poor, leading to increased inequality and a higher absolute number of extremely poor people.

Social, economic or environmental factors are intertwined with the demographics. The influence of population growth is not confined to developing countries.
Each social and demographic development should be based on the concept of sustainable development. The concept of sustainable development is already established and accepted in modern development of Montenegro. Sustainable development implies a harmonious combination of economic and social factors in strict compliance with preservation (protection) of nature and natural resources. In other words, sustainable development means balancing economic news, social and environmental factors in order to foster social progress, social prosperity.

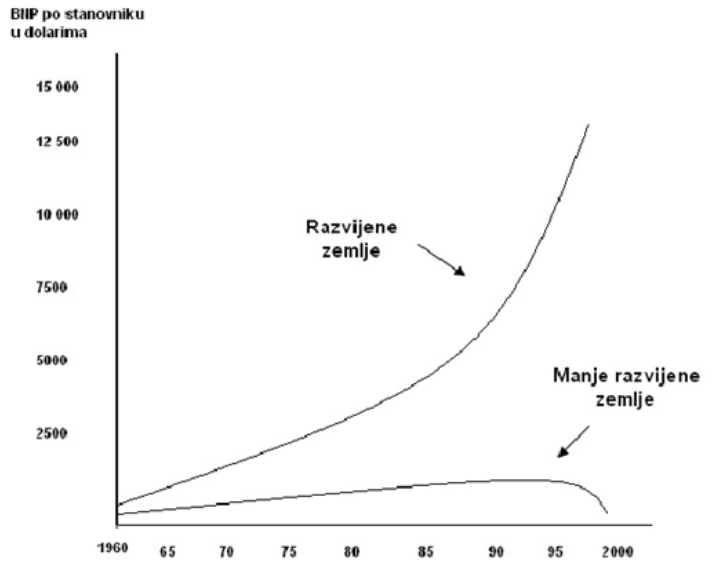
Populations that exceed their environment are forced to suffering and dying. Degradation and pollution of the environment in a given area depends on three factors: the number of people, the average number of units of resources used by each person, and the amount of degradation (pollution) caused by the use of unit of resources. Model of the impact of these factors on the environment is shown in this example:



These factors affect the two types of the overloading of the available resources and the environment: population and consumption overload. Population overload occurs when there are more people than food, water and other resources which give the minimum of existence. Consumer overload is characteristic of industrialized countries. It is used by a small number of people with high intensity, so it leads to a rapid depletion of resources, high pollution and environmental degradation. The environmental is impacted by the growing increase in the gap in development between developed and developing countries. Developed countries account for 22% of the total world population, have 80% of global economic wealth of minerals and energy, and produce most of the pollution and waste. If the world continues with this pace of development, many resources will disappear, and the nature will become

polluted. The development must be aligned with the development of eco-sphere, and the world is connected as an integrated whole.

Graph 1. The discrepancy in the growth of GDP per capita between developed and developing countries



Source: http://www.oecd.org/

In other words, it is necessary to determine the development of supporting industry and thereby ensure timely discovering and paralyzing possible conflicts in the development, and the conflicts athe interbranch level, and conflicts between socio-economic development, on the one hand and environment on the other. The four pillars of development: agriculture (organic), energy, industrial production and tourism. All development projects should be based on these priorities.
Population policy based on that issue here is nothing but the direction of demographic trends towards pre-defined goals of social development. It should ensure that demographic developments enhance socio-economic developments and vice versa.

Conclusion:

The planet Earth can not continue to provide support to demographic explosion. We need to limit population growth so that the world does not bring people who will have little chance to have a minimally decent life. In addition, we must recognize that poverty is a major factor which encourages hiperpopulation. Therefore, it appears that future generations have a strong claim to our use of various resources that are essential for their wellbeing. Clean air and water, a stable atmosphere and

climate, fertile agricultural land, clean and available energy - all that is in obvious ways related to the central interests of the people of the future. But, what about other, less essential resources? Do future generations have the right to undeveloped coastline, wilderness areas, wetlands and the foundations of the mountains? Do we owe to future generations to protect animal and plant species? Is protection of these resources equal to the treatment of these resources from charity than acting out of duty? Do future generations have a right to such resources? We understand that the future generations are able to enjoy these resources, such as we enjoy. But, again, maybe they could not.

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