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MASTER'S THESIS

Economic Efficiency of Saving Human Lives for Developing Economies:

Comparison of Ukraine and Russia

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Declaration of Authorship

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Abstract

Human capital is known to have an important contribution to economic growth; however most of the empirical studies determine human capital as number of years of schooling. In this thesis human capital is analyzed in terms of health. General demographic situation with its problems, including low life expectancy, premature mortality, negative population growth, and economic performance of Ukraine and Russia are discussed. Extra-high mortality in these countries resulted roughly in yearly losses of 5.9 billion US Dollars for Russia, and 1.5 billion US Dollars for Ukraine. Economic and political measures can prevent the countries from demographic catastrophe and economic losses.

Key words: Economic growth, Human Capital, Demography, Premature Mortality.

Abstrakt (in Czech)

Lidský kapitál, jak je známo, má významný přínos k hospodářskému růstu. Nicméně většina empirických studií, které se zabývají lidským kapitálem, jej hodnotí spíše dle gramotnosti či vzdělání obyvatelstva. V této diplomové práci je však lidský kapitál analyzován z hlediska zdravotního stavu populace. Práce se zabývá obecnou demografickou situací a jejími problémy, včetně nízké úrovně života, předčasnou úmrtností, negativním populačním růstem a výkonností ekonomiky Ukrajiny a Ruska. Velmi vysoká úmrtnost v minulých letech vedla v těchto zemích k ročním ztrátám ve výši cca 5,9 miliardy amerických dolarů pro Rusko a 1,5 miliardy pro Ukrajinu. Těmto demografickým katastrofám a hospodářským ztrátám mohou zabránit politická a ekonomická opatření.

Klíčová slova: hospodářský růst, lidský kapitál, demografie, předčasná úmrtnost

Introduction

Economic development is an increase in the standard of living of a nation's population with sustained growth from a simple, low-income economy to a modern, high-income economy (Krueger, 2009). Nation improves its well-being, social, economic and political environment, and achieves higher level of welfare. Economic development of the countries is possible due to the various factors, like historical background, traditions, effective legislative framework, level of technological progress, and, of course, productive labor force.

Economically active population, or labor force, is essential for an economy and its performance. Labor force creates production and services, and so the wealth of the country. Labor force pays taxes so to maintain needs of the country and to help to redistribute income among different social categories of the population. Labor force, economically active and healthy labor force, increase productivity and profits of the industries and of the whole economy.

The advantages of saving people from the premature death might be an additional economic surplus, additional taxes that would be used for healthcare and retirement pays, and finally saving every single life is an aim of humanity. However, there are some disadvantages of saving human lives: GDP per capita will decrease as number of people is large, health care expenses will rise as people will stay alive but not everybody will be healthy, retirement pays will increase significantly as those saved people will become retirement benefits beneficiaries later on.

More and more data indicates the two-way relationship between health of population and economic growth in the country (see Bloom, 2001; Acemoglu-Johnson, 2006; Suhurcke, 2007). Economic growth improves the quality of live, health of the population, and healthy population, by turn, improves economic growth of the country. Therefore, state and international institutions which are interested in economic development of a country have to consider seriously the investment to the health of population.

Nevertheless, there is not enough data on transition economies of Central and Eastern Europe, and of Commonwealth of Independent States (former Soviet Union countries), that face crucial

problems in health care systems, mostly connected to non-communicable diseases (such as cardiovascular diseases and neoplasm) and accidents. Economic consequences of such problems are not fully examined.

Russian Federation and Ukraine are taken as analyzed sample from developing countries. These are post-communist countries that can represent the tendencies of the rest of the countries with the same history and economic performance. Thus, the main research is based on Russia and Ukraine's data; however it can be implied to most of the transitory economics, Eastern Europe countries.

The most recent data is taken for the analysis, based on the World Health Organization, World Bank, Russia's and Ukraine's Statistics Committees information. The analyzed time period is from year 2000 till 2008.

There are important research questions that are to be discussed:

- How crucial bad health of the population for the economy of the country?

- If morbidity and mortality of economically active population would decline, what economic benefits can it bring?

- What actions are to be taken by a government to achieve desirable results, such as decreasing premature death rates?

Thus, the hypothesis of the work is that the saving human lives from premature death will cause an increase in the economic growth of the countries with developing economies.

It is obvious that bad health causes negative consequences for the country's economy. However, how big are the consequences? What real actions can a state provide so to give the possibility for better health for the citizens and, therefore, to ensure high economic growth rates.

In the first chapter, the discussion will begin with some theoretical background of economic growth theories, including human capital as a production factor for the models. There is also a literature observation will be present with some empirical results about correlation of human capital in terms of life expectancy with economic growth of the countries.

To understand the economic situation in analyzed states, in the second chapter we provide the general information about the countries, short historical background, and description of economic indicators, such as GDP, inflation, unemployment, and basic data on financial and production sectors. Taking into consideration the recent financial crisis, one should mention the negative tendencies in macroeconomic indicators since year 2008. However, we will not focus on it too much, as the most important are the general tendencies since the year 2000.

In the third chapter, the demographic situation of Ukraine and Russia will be discussed. Total population number and its constant decrease, high mortality rates and low fertility rates, short life expectancy, and main causes of mortality are to be analyzed. There are a lot of demography problems in these countries, so they will be discussed in details, with further projection of them to economic development of the countries. For instance, one third of Ukrainian is dying prematurely, before being 65 years old. Moreover, men can hardly live till their retirement age.

In the fourth chapter the policies against premature mortality in Russia and Ukraine will be discussed, pointing out the most reasonable solutions, and future development of the countries will be roughly predicted, including GDP growth rates, population growth rates, their interdependence and possible consequences of swift decrease in economically active population.

In the conclusion, we will summarize the basic macroeconomic and demographic facts about the countries, as well as the results of our analysis of population health and economic growth correlation, and comparative studies of demographic situation in Ukraine and Russia.

This research is useful in terms of good practice of writing economic and demographic surveys for the country, that can be used both on the national and international levels. This kind of surveys, or working papers, is common for Ministries of Economic Affairs, Ministries of Public Health, World Health Organization, World Bank institution and other organization, so to define the main priorities and problems of the countries and to help to solve them.

The results of this research are important for those, who develop the economic policy and health care policy, as well as for international institutions interested in economic and social development of the analyzed countries. Investment to health of economically active population is definitely one of the possible ways to achieve desired economic goals. Possibly, this paper will influence the states to invest more into health of population, as one of the driving force of economic growth.

Chapter 1
Theoretical Framework: Human Capital as a Production Factor of Economic Growth

'Government is not the generator of economic growth; working people are.'

– Phil Gramm, US politician, economic adviser

Economic Growth is a key element of economic theory and macroeconomics. It is closely associated with general equilibrium and business cycles development (Mankiw, 1992). Moreover, the process of economic growth is usually seen as extended reproduction, economic development and social progress. The evidence of accumulation of human capital and the influence of its size on economic growth is still quite contradictory. Main problems here are the difficulties with defining human capital, with a large number of theories and methodologies of analysis of human capital and economic growth, and with differences in clusters of countries the analyses are performed on.

The quality of the data and time the analysis is made of, also cause contradictions in evaluations of influence of human capital on economic growth. There are also different kinds of models used for the analyses, that consider different data and, as a result, different relationships.

Nevertheless, intuitively we can state that labor quality in the form of human capital definitely contributes to economic growth. Healthier workers are stronger physically and mentally, they are more energetic and have better entrepreneurial spirit, and therefore they are more productive. Being more productive implies development and growth. Moreover, healthy people are less likely to be absent at work due to illness, less likely to be retired prematurely, and, finally, less likely to die prematurely. This intuitive assumption is to be tested, so we are going to check how much population health influence economic growth in developing economies.

Health is usually measured in terms of life expectancy. It has appeared in many cross-country growth regressions, and results usually showed positive correlation of life expectancy and economic growth (Bloom and Canning, 2000; Lichtenberg, 1998; Acemoglu and Johnson, 2006). However, those regressions do not clearly state cause-and-effect relation of population health and economic growth, and they did not exclude the possibility of being a proxy for other missing variables.

We also understand that human capital is a multidimensional category, so we will try to pick its main attributes. Considering growth regression models we will consider life expectancy as a representation of health of population. For comparative analysis we will use mortality and population growth rates, and for descriptive analysis – main causes of death of population.

Analyzing developing economies, such as Ukraine and Russia, it is important to point out their main features of development. There was an exogenous character of transformation of Soviet economies to market principles, and its exogeneity explained its limitedness (Osipian, 2006). External factors, such as new political parties, social struggles and national and geopolitical conflicts, lead post-soviet countries in changing their usual way of production and operation, service and management. By year 2000, it became clear that exogenous character of transformation is exhausted, and endogenous factors are to be a driven force for development. That is when priorities and ways of development are chosen based on mechanisms of country's own development and available resources.

Continuing the discussion, we would like to introduce the theoretical framework for analyzing economic growth, including human capital as a factor of production, with a further discussion of the recent research made in this area.

1.1 Theories of Economic growth

Theories of economic growth are been greatly modified with the flow of time. Increasing number of researches caused quality improvements and also a "competition" among different kind of models, recently – exogenous and endogenous growth models.

In early stages of evolution of economic theory, economists considered economic growth mostly only by increasing of national wealth. In XV-XVII centuries, according to the mercantilists' theory, an economic growth was considered as an increase in national capital in terms of gold and silver coins and positive trade balance. In XVIII century the Physiocrats argued that all economic processes in a country were self-regulated and the main industry of production was agriculture. Adam Smith (1776), as a father of modern economics, considered capital accumulation as a key aspect of capitalism and economic growth. He offered to increase productivity and capital accumulation by reducing wages of workers. Smith stressed an importance of technology and division of labor. John Stuart Mill supported an idea that total output is a function of capital, labor and land. However, Joseph Schumpeter (1911) was the one who emphasized an importance of entrepreneurship and human capital in a whole (Nelson, 1996).

Human capital was defined by Smith (1776) as skills, dexterity (physical, intellectual, psychological, etc) and judgment. A more recent definition of human capital was introduced by G. Becker (1964): 'one can invest in human capital (via education, training, medical treatment) and one's outputs depend partly on the rate of return on the human capital one owns. Human capital is a mean of production, into which additional investment yields additional output. Human capital is substitutable, but not transferable like land, labor, or fixed capital.' However, some labor economists have criticized the above approach, claiming that it tries to explain all differences in wages and salaries in terms of human capital, but those differences might be explained by personal connections with insider, gender and nativity wage differentials, discrimination in the work place, and socioeconomic status. Nowadays human capital is central to debates about welfare, education, health care and retirement.

The modern economic theories began with Ramsey (1928) and his time dependent utility function and optimization condition. He stated that in case of shortening current consumption by

increasing saving, the future consumption will rise. Consequently, if marginal utility of capital is high, then losses from current shortening of consumption will be lower than benefit from future consumption. Nevertheless, Ramsey simplified the model by considering people in an economy either to be constant in number or to have unchanged preferences over time.

Then Robert Solow designed an exogenous growth model with an equilibrium and constant growth of production, employment, capital and a constant capital-output ratio (Solow, 1960). The Solow model focuses on four variables: output (Y), capital (K), labor (L), and knowledge or the "effectiveness of labor" (A). At any time economy has some amount of capital, labor, and knowledge, and these are combined to produce output:

$$Y(t) = F(K(t); A(t)L(t)) \tag{1.1}$$

where t denotes time.

A specific example of a production function is a Cobb-Douglas function:

$$F(K, AL) = K^{\alpha}(AL)^{1-\alpha}, \ 0 < \alpha < 1. \tag{1.2}$$

which is easy to analyze and appears to be a good approximation to actual production functions (Romer, 2006).

Population growth alters the Solow growth model in the following ways (Mankiw, 2003):

1. In the steady state with population growth, capital per worker and output per worker are constant, because all of the categories are growing at rate n. Even though population growth cannot explain sustained growth in the standard of living, it helps in explaining sustained growth in total output.

2. Population growth also gives some explanation why some countries rich and some are poor. With an increase in population growth, from n_1 to n_2, the steady state level of capital per worker decreases from k_1^* to k_2^* (see Figure 1.1).

Figure 1.1 The Impact of Population Growth on Capital per Worker, Solow Growth Model
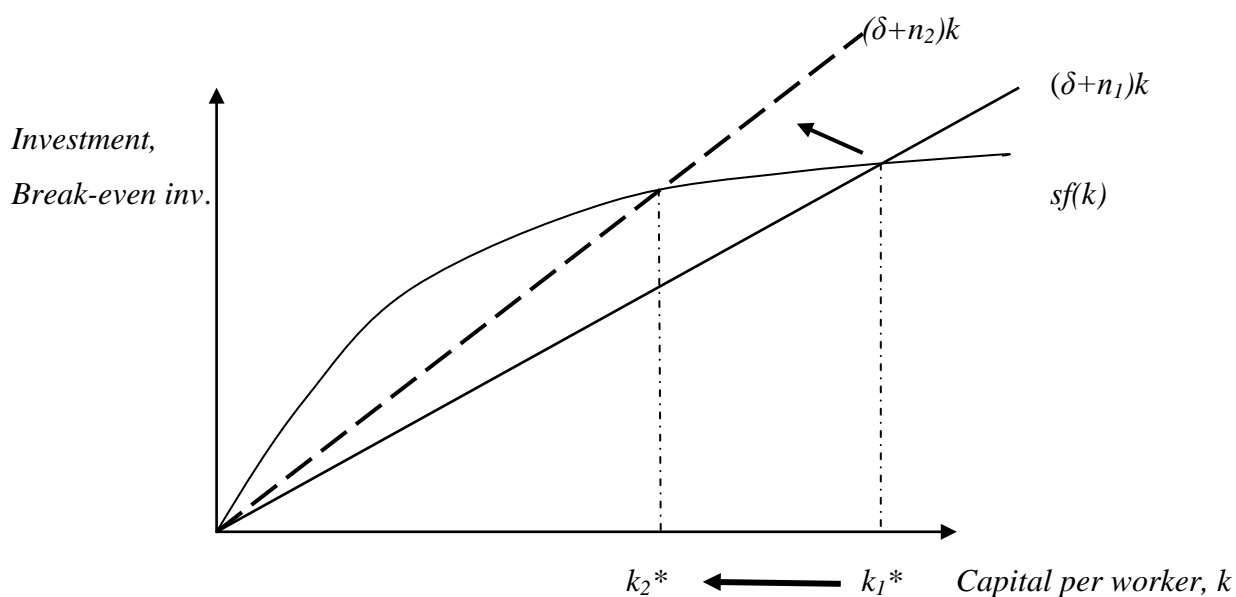
The figure above shows, that an increase in the rate of population growth from n_1 to n_2 shifts break-even investment line, $(\delta+n_1)k$, up, that results in the new steady-state value of capital, k_2*, which is lower than the one before. Thus, increase in population causes decrease in capital per worker.

The Solow model gives the following conclusions: the higher savings rates – the wealthier the country would become, and the higher growth rate of population – the poorer the country (Mankiw, 1992).

Exogenous models of growth assume exogenous factors to stimulate the growth and they ignore the possibility of self-development. Endogenous models do not pay proper attention to the structures of dynamic systems, to dominant production relations and to endogenous nature of some non-economic factors (Osipian, 2007). Despite of these disadvantages, we still prefer to use endogenous model to describe transition economies. That is the reason to consider exogenous growth model of Solow to be unable to describe a growth process of a transition economy. Moreover, endogenous growth models should be used because of the endogenous character of human capital. Human capital plays an important role in pushing economic growth. Such an endogenous nature of human capital means that human capital is produced within society and for the society in order to use it for further social production.

In endogenous growth models crucial importance is usually given to the increase of production caused by new technologies and human capital. Endogenous growth theory demonstrates that policy measures can have an impact on the long-run growth rate of an economy. For example, the models of R&D and growth developed by P. Romer (1990), Grossman and Helpman (1991), and Aghion and Howitt (1992) noted that subsidies for research and development or education increase the growth rate by increasing the incentive to innovate (Romer, 2006).

Economic growth before the transition was mainly exogenous, and thus an enormous amount of capital and labor was needed from outside to maintain the economy and stimulate its growth. The level of development of human capital was very high, but technological progress was not implemented in all spheres of the national economy. Basically, economic growth of the planned economy was stimulated because of increasing the production, not investing in the human capital. It caused the problems of diminishing returns to human capital and not developed technological progress. Moreover, besides ineffective usage of new technology, there was also ineffective allocation of productive forces.

Hence, the problems were accumulating even before the process of transformation of the economies. When the process of transition was started, new problems appeared. There were significant outflows of physical capital, human capital (known as brain drain), a significant level of corruption and an undeveloped legal framework and infrastructure. Negative economic expectations, downward economic development and unstable social position stimulated emigration and brain drain (Dayton-Johnson, 1999).

In the situation described above the main way of stimulating economic growth was to attract investment from abroad. It could either substitute human capital, or stimulate the performance and the staying of human capital in the country. Nevertheless, the flow of investment was too low to satisfy these functions. Thus, it is important to find other factors that could stimulate economic growth besides capital accumulation. One of the main factors discussed above is the accumulation of human capital.

Growth models that include human capital is an extended Solow growth model. Production function that include human capital which was proposed by Mankiw (1992):

$$Y = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta}, \ 0 < \alpha < 1, \ 0 < \beta < 1, \ \alpha+\beta<1 \tag{1.3}$$

where Y – output, K – physical capital, H – human capital, L – labor; A – technological parameter, which grows at constant rate φ.

It is useful to use in terms of considering the human capital together with main production factors, such as capital and labor.

Growth model was formulated as:

$$y_{it} = a_0 + a_1 D_1 + a_2 D_j + a_3 \ln S_{it} + a_4 \ln(n_{it}+\alpha+\delta+\gamma) + a_5 \ln X_{it} + a_6 \ln h_{it} + \varepsilon_{it} \tag{1.4}$$

where y_{it} –output in per capita form, S_k – savings in total GDP, %; n_{it} - growth rate of population; α – technological progress, exogenous parameter; δ – depreciation of a human capital; γ – depreciation of a physical capital; X_{it} – level of income per capita in the beginning of each period; h_{it} - human capital, measured in years of schooling and number of doctors per 1000 people; D_t - coefficient for a particular country, particular period of time.

Another approach was offered in NBER Working Paper 8587 by David Bloom (2001), which considered the following production function:

$$Y = AK^\alpha L^\beta e^{\varphi_1 s + \varphi_2 exp + \varphi_3 h} \tag{1.5}$$

where Y is output or gross domestic product (GDP), A represents total factor productivity (TFP), K – physical capital (in terms of investment), L – labor force, and human capital consists of three components: s – average years of schooling, exp – average work experience of work force in years, h – health (in terms of life expectancy).

Taking logs of the aggregate production function, an equation for the log output of country i at time t is derived:

$$y_{it} = a_{it} + \alpha k_{it} + \beta l_{it} + \varphi_1 s_{it} + \varphi_2 exp_{it} + \varphi_3 h_{it} \tag{1.6}$$

where y_{it}, k_{it} and l_{it} are the logs of Y, K and L, respectively. a_{it} – the level of TFP in country i at time t, is not observed and appears as an error term when the equation is estimated.

These models are important for epirical investigation of the influence of human capital on economic growth of the countries.

We would also like to add a few more words about transition economies. What factors to take into account and what important steps are for achieving economic growth in transition or developing economies? Economists had different views of the main steps in economic reforms in transition economies. One of them was Blanchard (1997) who proposed to pay attention and regulate following points:

- macroeconomic stabilization,
- price and market liberalization,
- liberalization of currency exchanges and foreign trade,
- privatization of state enterprises,
- forming of competitive market,
- running government programs for stable macroeconomic environment, legal framework and property rights.

Moreover, Blanchard argued that output would definitely fall during a transition and there will be no rise in new sectors in the national economy until new incentives for production have been found. To examine the nature of economic growth and the role of human capital in post-transformation economies the following factors should be considered: amount and structure of foreign investment, outflow of capital, value and maintenance of foreign debt; level of socialization of the economy; level of economic and social development, including development of the labor market and the stock market; the level of human capital in the national economy, the rate of economic growth and macroeconomic dynamics, the correlation between human capital and economic growth, and possibilities and opportunities for transition from exogenous to endogenous form of economic growth.

Therefore, we see that there are quite a lot theoretical approaches for investigating and explanation of economic growth. Nevertheless, our main interest is still the influence of human capital on countries' development. In the next section we describe some empirical evidence from all over the world that touches this problem.

1.2 Empirical Evidence on Health and Economic Growth Dependence

Health performance and economic performance are interlinked: wealthier countries have healthier populations (Frenk, 2004). However, what is the cause-and-effect relation, and what are the most important factors of human health that are causing the economic growth, it is still studied well enough.

Economic growth requires not only healthy individuals but also education, well functioning markets, good governance and institutional arrangements that encourage technological advancement. The other way to link health with economic growth is to recognize a simple fact that healthiness of people increases with the increase in personal income. It is empirically found that the income elasticity for the health and nutrition-related products are positive and more than one (WHO, 2000). As levels of personal income rise, a relatively higher share is spent on consumption of health care products and products enhancing and sustaining better nutrition. At the same time, a person who is healthy devotes quality energy for work and thereby can earn a living. Therefore, one can conclude that poverty or inadequate income levels contributes to the persistence of ill-health as the person concerned is not able to finance his treatment. This in turn contributes to greater loss of working hours, culminating in a decline in the growth of GDP of the entire economy. "The fact that ill-health reinforces poverty is less understood than the view that poverty causes ill-health" (Shariff, 1999).

Significant research in this area is made by National Bureau of Economic Research (NBER), World Bank, Organisation for Economic Co-operation and Development (OECD) and World Health Organization (WHO).

NBER Working Paper 8587 "The Effect of Health on Economic Growth: Theory and Evidence" shows an interesting result: they calculated that a one year improvement in a population's life expectancy contributes to a 4 percent increase in output. (Bloom, 2001). For the estimation they used panel data for 1960-1990. Besides main inputs as physical capital and labor, they included human capital in the three dimensions of years of education, work experience, and health in terms of life expectancy.

NBER Working Paper 12269 "Disease and Development: The Effect of Life Expectancy in Economic Growth" also investigated the effect of life expectancy at birth – as a general measure of the health of the population – on economic growth. The conducted research measured the relationship for 59 countries, including rich, poor and middle income countries; analyzed period was 1960-2000. The outcome of the regressions was the following: 1% increase in life expectancy was related to an approximately 1.3-1.8% increase in population, but there was not statistically significant effect on total GDP. More importantly, relative growth rates for GDP per capita (and GDP per working age population) show some decline in countries experiencing large increases in life expectancy (Acemoglu-Johnson, 2006).

WHO, on behalf of behalf of the European Observatory on Health Systems and Policies, published a paper "Economic consequences of non-communicable diseases and injuries in the Russian Federation", which found out that the static economic benefit (i.e. valuing a life year gained by one gross domestic product (GDP) per capita) of gradually bringing the Russian Federation's adult non-communicable disease and injury mortality rates down to the most recent rates for European Union (EU) Member States (those belonging to the EU prior to May 2004) by 2025 is estimated to be between 3.6% and 4.8% of the 2002 Russian GDP (Suhrcke, 2007).

World Bank Working Paper 51829 "An Avoidable Tragedy: Combating Ukraine's Health Crisis – Lessons from Europe" reports that about half of deaths before the age of 75 in Ukraine could be avoided through behavior change and adequate prevention and treatment. In particular, 94 percent of mortality caused by three major risk factors: tobacco smoking, alcohol consumption and breach of road safety -- could have been avoided with adequate prevention. Furthermore, 25 percent of pre-mature deaths in Ukraine in 2004 could have been avoided with effective health care treatment. Early treatment at the primary care level could have avoided 80 percent of deaths among working age males and about 30 percent among working age females. This of course would result in higher productivity and benefits for the country.

WHO's report of the Commission on Macroeconomic and Health "Macroeconomics and Health: Investing in Health for Economic Development" (2001) based on least-developed countries, low- income and lower-middle-income countries and calculated on data from year 2000, with further projections to 2007 and 2015. They found out, that economic program on improving the

health of the population for low-income countries would yield economic benefits vastly greater than its costs. Eight million lives saved from infectious diseases and nutritional deficiencies would translate into a far larger number of *years* of life saved for those affected, as well as a higher quality of life. They estimated that approximately 330 million of disability-adjusted life years (the increased years of life and the reduced years of living with disabilities) would be saved for each 8 million deaths prevented. Assuming, conservatively, that each disability-adjusted life year saved gives an economic benefit of 1 year's per capita income of a projected $563 in 2015, the direct economic benefit of saving 330 million disability-adjusted life years would be $186 billion per year, and plausibly several times that.

Thus, analysis of the literature shows that it is not always possible to link health in terms of life expectancy to growth of GDP for low-income and middle-income countries, however in most of the cases working studies report the need of improving the health of the population for further development of the economies and the quality of life in particular.

To conduct our own analysis of developing economies of Ukraine and Russia, we would like first to begin with macroeconomic data description, then to continue with demographic data, and then to combine both of them and to check whether we can find reasonable dependence between health of the population and economic growth, and whether it is reasonable for a state to prevent all of that premature mortality.

Chapter 2
Comparison of Macroeconomic Indicators of Russia and Ukraine

Comparison of economic performance is usually made in terms of comparison of economic indicators, such as GDP, GDP growth rate, unemployment, inflation, etc. (Mankiw, 2003). The countries all over the world are different in terms of living conditions, natural resources, institutional development, number of population, social norms and others, thus it is important to choose some indicators which could be used as a general comparison value for analysis of the countries' performance.

To analyze the dependence of economic growth and demography issues in the countries of interest – Russian Federation and Ukraine – we would like first to discuss the general conditions of these countries, such as their historical background and general facts about the countries, and then to describe deeply the economic situation in there. Macroeconomic indicators, such as Gross Domestic Product (GDP), inflation, unemployment, and general facts about financial and production sectors, will be analyzed.

Having this economic overview, it will be easier to understand the demographic problems and their correlation with economic development of these countries.

2.1 Short Historical Background of Russia and Ukraine

Russia is a county in northern Eurasia, semi-presidential democratic republic, comprising of 83 democratic subjects. Russia shares borders with 16 countries, and it is the largest country in the world (17 thousand sq. km.) with population of 142 mln people – 9th place in the world. GDP

per capita is \$16 thousand, and human development index HDI is 0.81 – 71st place in the world (World Bank, 2010).

Ukraine is a country in Eastern Europe, which shares a border with Russia and 6 other European countries. It is also a semi-presidential republic, composed of 24 provinces and one autonomous republic Crimea. Total area is 0.6 thousand sq. km, with population of 46 million people – 27th place, total GDP per capita is \$7 thousand, and HDI is 0.78 – 76th place in the world (World Bank, 2010).

Russian and Ukrainian macroeconomic indicators have been characterized as of high volatility since the collapse of the Soviet Union and establishment of the independent states of Russian Federation and Ukraine. There were numerous attempts to decrease this volatility using various macroeconomic policies. As a result, only a few policies, implemented by the State, had a positive influence on the county's economy, others failed due to various reasons.

It is quite obvious that there are certain historical reasons for such a situation. It is hard to overestimate the strength and severity of the economic depression which the countries of the former Soviet Union (Ukraine and Russia included) faced in the beginning of 90th. In nearly all of the former Soviet Union states, the Stalinist command economy has given way to some hybrid form of a regulated market environment. Market forces increasingly dominate economic life of the states, yet the new business and financial sectors, dominated by small oligarchies of the Soviet period holdovers and new capitalist elite, have been unable to create the conditions for a general economic revival (Rutland, 1997).

Attempts to fight the volatility of the Russian macro economy were quite common at that time and were changing constantly. The first one to start was the Prime Minister Yegor Gaidar. His "shock therapy" resulted in hyperinflation, a sharp decline in domestic output, the wiping out of the people's savings and a sharp decrease in the living standards. The following and more cautious reform policies pursued by Viktor Chernomyrdin's government permitted a moderating of these extreme consequences, and contributed to a stabilization of the economic transformation. There were some notable macro-level economic achievements, including brining inflation under control, privatizing most industries, making the currency convertible and developing a generally liberal foreign trade system. Yet even granting the moderation of the

economic reform course, as of 1994-96, most Russian were still reeling from the country's economic transformation, and were skeptical about the prospects for any near-term improvement (Jones, 98).

As of mid-1996, four and a half years after the launching of Russia's post-Soviet economic reform, it was still hard to make any trustable forecasts regarding the further development of the country. The Russian economy has passed through a long and wrenching depression. Official Russian economic statistics indicate that from 1990 to the end of 1995, Russian GDP declined by roughly 50%, far greater than the decline that the United States experienced during the Great Depression (World Bank).

However, alternative estimates by Western analysts described a much less severe decline, taking into account the upward bias of Soviet-era economic data and the downward bias of post-Soviet data. E.g. IMF estimates much of the decline in production has occurred in the military-industrial complex and other heavy industries that benefited most from the economic priorities of Soviet planners but have much less robust demand in a free market (IMF, 2009).

Other major sectors such as agriculture, energy, and light industry also suffered from the transition. To enable these sectors to function in a market system, inefficient enterprises had to be closed and workers laid off, with resulting declines in output and consumption.

Nevertheless, after 10 years of independence, the sates had started to show positive economic growth, developing not only in a production, but also in a service sector, and changes for the better occurred.

2.2 Comparison of Macroeconomic Indicators of Ukraine and Russia

2.2.1 Gross Domestic Product

In the recent decades Russian and Ukrainian economies has been showing positive trends in the most of the spheres. After the crisis caused by the collapse of the Soviet Union, Russian economy slowly began its recovery until the financial crisis in 1998, the reasons for which were the "shock therapy" of the State. After recovering from the crisis, Russian Federation was showing one of the most promising growth rates of the GDP and production in the post Soviet space.

As it is shown in Figure 2.1, Russian economy has experienced a positive trend since 1999, which has naturally been reflected on its GDP, the growth of which has varied between 6-9%. In the absolute numbers Russian GDP grew from 196 bln USD in 1999 to 1608 bln. USD in 2008 – which is almost 8 times for only 9 years (Roskomstat, 2009). The main determinants of the GDP growth are oil price, real exchange rates and investments. It has been calculated that a 10% permanent increase in the prices of oil cause the GDP level to increase by 2.2% and a appreciation in the real exchange rate leads to 2,4% decrease in the long run level of GDP (Juoko, 2003).

Figure 2.1: Russian GDP, 2000-2009, bln USD
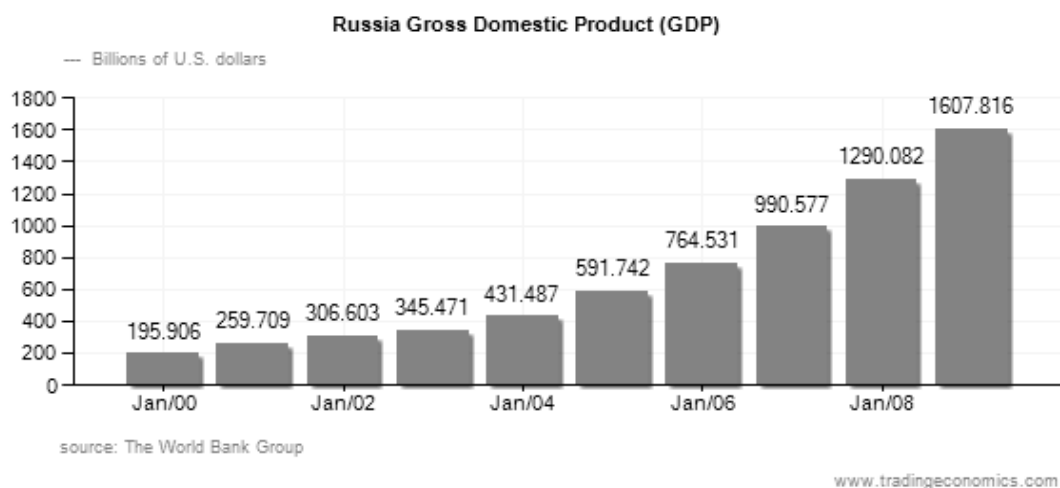
Before 2008 Russian economic structure has been characterized by the small share of services in the GDP. Due to the legacy of centrally planned economy the importance of industry, especially heavy industry, has been high. These factors might explain the downward trend in the share of

services between 1998 and 2000. Since 2000 the share of the service sector in the GDP composition has increased, constituting 60,1% of GDP in the accumulative September 2003 figures. Although this development will probably was curbed by increased energy prices, since energy sector has accounted for about half of all industrial investments (Komulainen, 2003). Even though services account for more than a half of the GDP, in international comparison the figure is still not so high. For example, in most of the European Union countries before the crisis the share of services accounted for approximately 70% or more of the GDP. Nonetheless, Russia seems to have converged to the industrialized countries in this respect during the new millennium.

However, due to worsening global environment-contracting global demand, falling commodity prices (including the oil prices) and tightening of credit has accelerated Russia's economic downturn in the period of 2008-2009. The estimated contraction in the real GDP in the first quarter of 2009 was 9.8%, compared to the 8.7% growth during the same period in 2008 (Figure 2.2) (Roskomstat, 2009).

Figure 2.2: Russia GDP Growth Rate 2006-2009, %
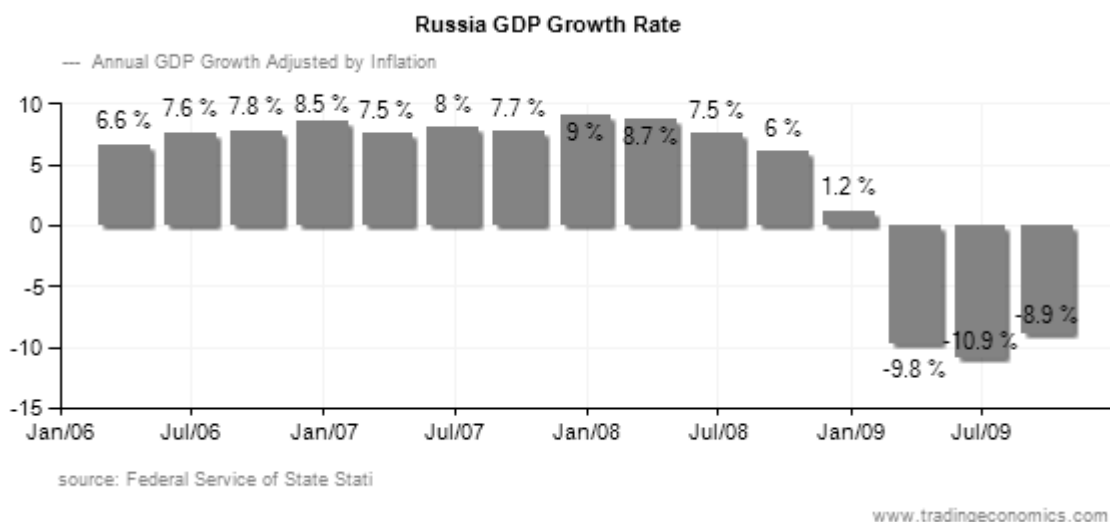
The industries, that were the most influenced by the crisis are the heavy industry, the extraction industry and banking and finance sector. Another crucial aspect of the downturn in the economy is the sharp decrease in the oil price on the World markets. The price dropped from almost 86.99 USD per the barrel in January 2008 to 35.40 USD per barrel in January 2009. This decline in price was major factor of decline in GDP of the State fro the period 2008-2009.

As to Ukraine, its post-soviet hyperinflation did not allow the Ukrainian economy to develop, until the new currency Hryvna was introduced in 1996. Already from 1999 a stable growth of the economy had begun. The GDP growth in Ukraine was very prominent and optimistic. In absolute values, it has grown from 31.26 billion USD in 2000 to 180.36 billion USD in 2008 (Figure 2.3).

Figure 2.3: Ukraine GDP, 2000-2008, bln USD

Source: http://web.worldbank.org
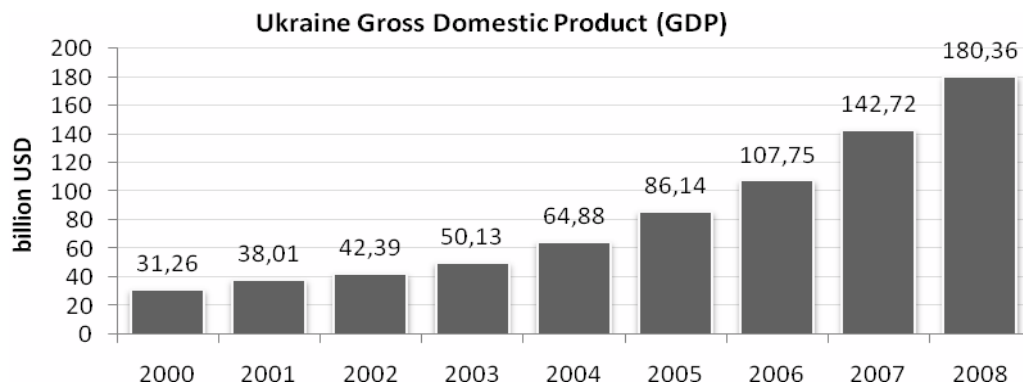
However, growth rates of Ukrainian GDP were very volatile: 5.9% in 2000, 12.1% in 2004 and only 2.7% in 2005 (Figure 2.4). Moreover, with beginning of the global financial turmoil, satiation has worsened, and GDP growth rates started to fall considerably quickly. World Bank experts think there is 14 percent contraction of GDP in Ukraine in 2009.

Figure 2.4: Ukraine GDP Growth Rate, 2000-2009, %
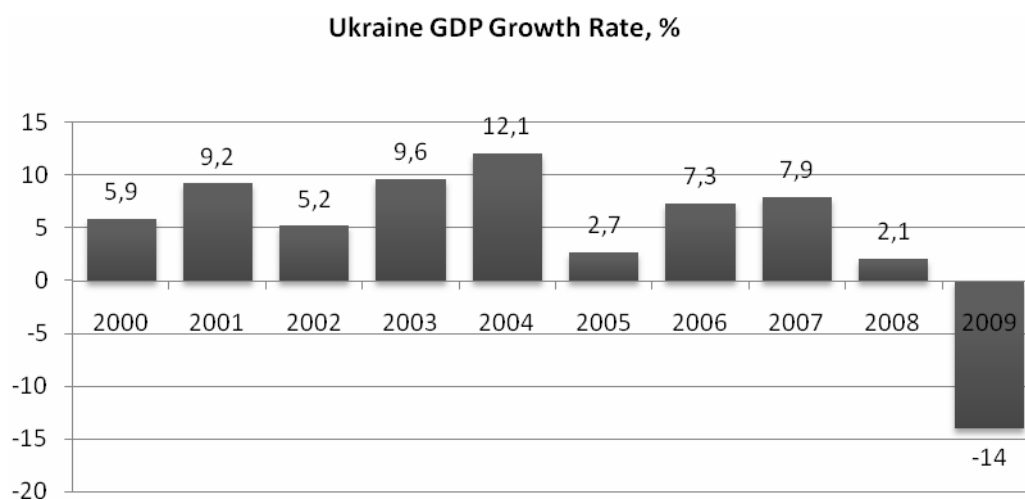
Source: self-made based on World Bank data

The decrease in 2002 was the consequence of the Ukrainian open economy character and of the low modernization level of the market. The increase in the industrial production made up 7% in 2002 (comparing to 14.2% in 2001).In the second half of 2002 the situation on the external market improved. Ukrainian exporters were privileged on the world markets due to the hryvna devaluation and the deflation of 0.6%. According to the ministry of Ukraine it was the consequence of the decline in prices for food production by 2, 3%.

The presidential elections took place in Ukraine on December 2004.The elections were held in the complicated circumstances. Falsification and forgery accusations were put over these elections. It was an opposition of the premier Viktor Janukovych and the resistance leader Viktor Juschenko, the latter had won the elections in the end. This period was called the Orange Revolution in the history of Ukraine. During the whole 2005 Ukraine experienced shocks in several sectors, such as oil, meat, and sugar production, and political and reprivatization shocks. This led to slowdown of the economy with GDP growth rate equal to 2.7%. The increase of the external demand on the markets led to the foreign investments inflow and the GDP grew by 7%. The GDP growth was relatively high in 2007 and was equal to 7,9%. The biggest part of the growth was due to the constructing, trade and processing industry.

The 2008 recession resulted in an export decline and decrease of the domestic demand. There was weak demand for steel, so the main industry of Ukraine suffered very significantly. The GDP decline was 14 percent in 2009.

Therefore, there has been a positive tendency in the growth rates of GDP of both countries before the crisis of 2008, but negative growths in Ukraine in Russia in 2009 due to the decline in prices for oil and gas, and lowering demand on the world market.

2.2.2 Inflation

The inflation level was quite volatile and high during the pre crisis period, although the annual level of inflation significantly decreased in 2007 compared to the mid 1991, when this number totaled 245%.

Figure 2.5: Russia Inflation Rate, 2000-2008, %
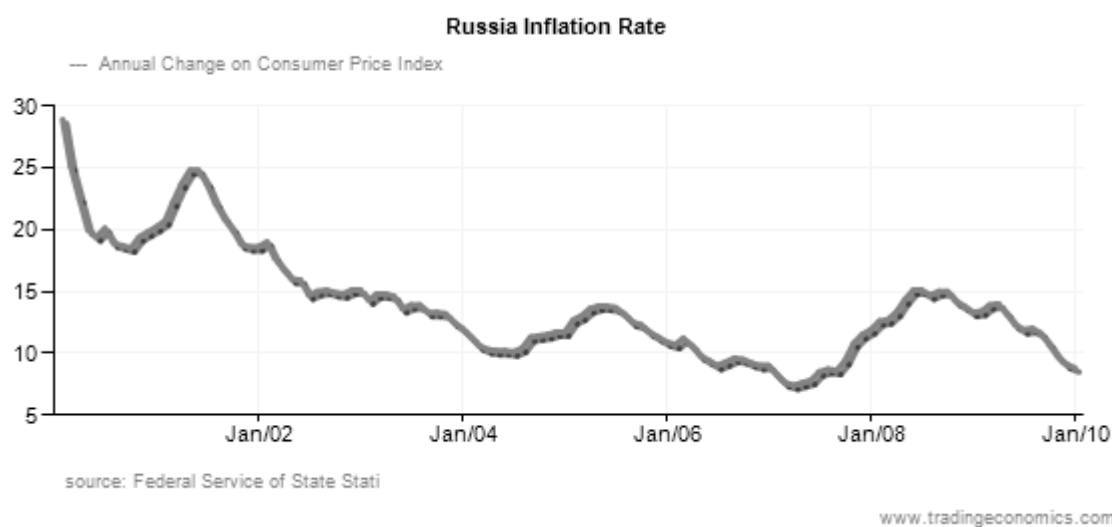
Figure 2.5 shows that for the period of analyses the level of inflation in the Russian Federation was decreasing gradually from 27% for the end of 1999 to as low as 9.3% for the year 2007. During the years 2006-2007 the inflation level remained largely under control due to low increase in food prices. The latest before crisis estimates show that for the first 10 month of 2007 the CPI inflation reached 9.3 percent which is well above the government initial target of 8 percent (Russian Economic Report, 2007).

During the crisis in 2008 inflation jumped up to 15%, and in 2009 it is slowly decreasing to the level of 9%. Inflation increase for the period of analyses was rather high but still not as dramatic as during previous crisis in 90th. There was a sharp increase in the inflation rate in 2008, but the overall projection stays within acceptable frontiers. At some point increase in inflation could be explained by the seasonal adjustment and natural increase in prices of certain consumer products.

In Ukraine, during the period of economic growth (2000-2007) inflation was also very volatile, as Ukrainian GDP growth rates (see Figure 2.6 below). Inflation rate was changing from 5,12 to almost 30%, with the highest inflation in 2008, during the world economic crisis.

Figure 2.6: Ukraine Inflation (Consumer Price Index), 2000-2009, %

During the analyzing period the growth of the consumption demand has stopped. This growth lasted for four-five years. However, so called "Ukrainian paradox" has appeared. In spite of the significant decline, the prices did not fall as in other European countries. Instead of the expected deflation, the inflation had happened. Increase of prices and simultaneous fall of the consumption demand has been undermining the Ukrainian economy since 2007. In 2009 the inflation of 14% was influenced not only by the economic factors but also by psychological factors. The bank system crisis and the atmosphere of the total distrust stimulated the price increase on the production. The inflation was caused also by the swift abridgement of the deposit portfolio of Ukrainian banks.

The stoppage of a bank crediting caused the end of economic growth as well. The prices of longtime usage goods, such as real estate and cars, decreased. Nevertheless, it didn't influence the inflation indexes as it is computed from the consumption bundle containing 12 of the services and goods. Prices for alcohol, cigarettes and drugs rose in 2009. The reason was the growth of the excise duty for cigarettes and alcohol. The inflation in Ukraine is caused mainly by emission of Hryvnas (UkrStat, 2009).

In general, inflation in Russia and Ukraine were quite volatile during the analyzed period, with the highest inflation in 2008 over the recent 8 years.

2.2.3 Unemployment

Increase in the level of GDP and production, decrease in the level of inflation, all this had a positive influence on the demand for labor in the principal economic sectors and a declining working-age population have all contributed to produce a significant and lasting reduction in unemployment. As it could be seen from the Figure 2.7, the level of unemployment in Russian Federation is very volatile during the period of analyses but has a strong tendency to decrease. The average unemployment fell to 4.6 million people (6.8% of the economically active population) in the year 2007, compared to an average of 9.4 million people (12.5% of the economically active population) in 1999 and 5.3 million people (7.6% of the economically active population) registered during the corresponding period of 2006.

Figure 2.7: The level of unemployment in Russian Federation, 2000-2009, %
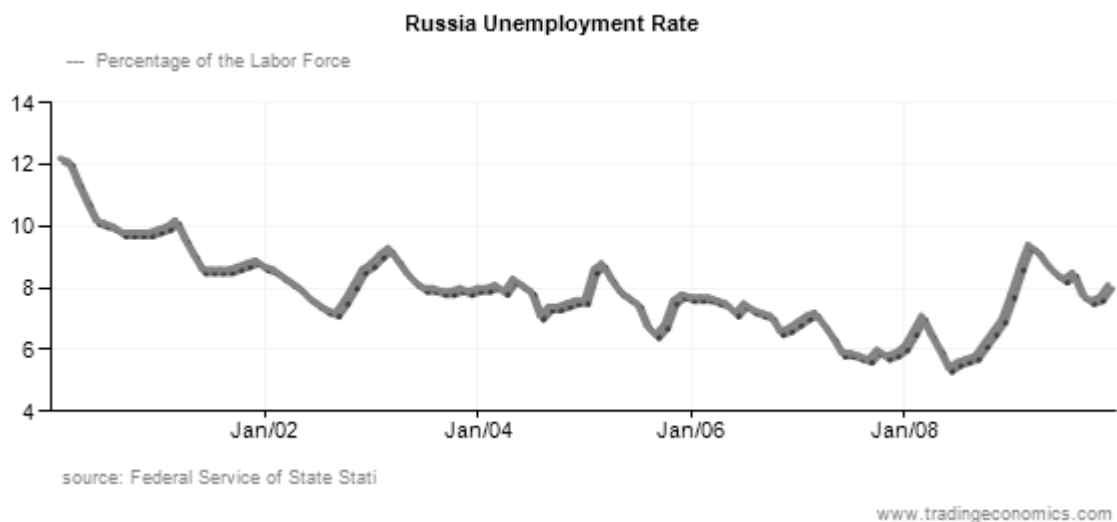
Period of analyses could also be characterized by increase in the real wages of the population, increase in the living standards and decrease of the number of people behind the poverty line. Taking into account the fact that Russian economy is commodity defined, due to the inflow of

payments from the commodity and oil sector during the past decade, poverty and unemployment declined steadily and the middle class continued to expand. Nevertheless, during the crisis period, the unemployment rate started to grow and reached its highest level in February 2009, when the rate of unemployment was 9.4%.

The unemployment level in Ukraine was continuously decreasing from the year 2000 when it was equal to 11.6%, down to 6,4% in 2008 (Figure 2.8). However, during the crisis unemployment has significantly increased, and official value was 9,5% in 2009. Moreover, experts think this rate is even higher because of unofficial hidden unemployment.

Figure 2.8: The level of unemployment in Ukraine, 2000-2009, %

Source: http://www.ukrstat.gov.ua/

Significant unemployment was caused by crisis in many sectors, especially metallurgy and industry. In December 2008 286.8 thousand people were officially unemployed. That is the highest indicator for the last 17 years. In the state employment office the number of officially unemployed is growing faster than the number of occupied vacancies.

The situation worsened also because of the gas conflict between Ukraine and Russia. Gas stopped transferring in Ukraine and the enterprises stopped the production because of the fuel deficit. The unemployment in Ukraine is growing in two forms: open and hidden. Until now the hidden unemployment have exceeded, which means forced administrative vacation, reduced

working day and reduced wage for workers. The employers are still keeping off the open mass unemployment, because they do not want the situation of deficit in the labor force to occur. The most important issue for them is the minimization of costs anyway.

The Ukrainian Trade Unions do not fulfill its main function which is to protect workers and fight job-loosing problem. The employers take different measures of breaking the Ukrainian labor law. In many companies people either do not receive their wages, or there wages have been reduced significantly. In case of the total interruption of the production the employers prefer to send the workers on the non-paid vacation than to dismiss them, as it would cost them a large amount of money. To make the open form of the unemployment dominate over the hidden the state control over the employers has to fulfill the Labor Law.

Therefore, the situation with unemployment during the crisis worsened, especially in Ukraine. Russian Unemployment rates are still under control.

2.2.4 Financial and Production sector

Russia and Ukraine did not inherit a sound banking system when the USSR collapsed. Their banking sectors mostly consisted of financial companies, or financial departments of big financial groups. Before the 1998 financial crisis there were 2600 banks registered on the territory of Russia. However the majority of them were small, single branch banks established by enterprises or cooperative units. The reason for such a big number of banks was a low minimum capital requirement and the imperfection in the legislation system. During the August 1998 about 50 percent of small banks collapsed and in the beginning of 1999 the numbers of banks were of 1380 which is still considered to be quite high (Jones, 1999).

After recovery from the financial crisis in 1998, banking system of Russian federation was developing quite successfully, showing only the positive trends. In the dawn of the ongoing financial turmoil total assets of the banking system of Russian Federation were 6.8% higher than in July 1998, banking capital increased 14.7% above its 1998 level and was equivalent to 5.1 % of the GDP, as opposed to 4.6% in 1998. The banks are much larger net creditors of the real

sector than they were: their net claims on the nonfinancial private sector at the end of the first quarter stood at 7.6 percent of GDP, up from 4.4 percent in January 1998. They also remain net creditors of the state, albeit to a greatly reduced extent: 3.2 percent of GDP compared with 6.7 percent during the pre-crisis boom in government debt (Central Bank of Russia, 2009).

If we have a look at the amount of net foreign assets of the banking system of Russian Federation, we can state that their amount for the period of analyses increased from 693 984 mln. rubls in 1999 to 9 652 496 mln. rubls in the end of 2007 (Central Bank of Russia, 2009). In 2005, there were about 51 credit institutions in the banking sector in Russia that were controlled by the foreign capital, whereas the number was 42 in 2003. This was the evidence on increase in the level of trust to the banking system from the foreign investors.

As to the evolution of the number of banks during the period of analyses, it has decreased from 1322 in 2000 to 1280 in 2007 (CBR, 2009). The reason for such a decrease is the increase in competition of the market; as a result increase in the market concentration. Although on our point of view such a big amount of banks is not appropriate even for Russia.

Most large Russian banks that survived the devaluation and banking crisis of August 1998 appear to have returned to profitability. Top-tier Russian banks could offer clients a broader range of products than just cash management services, but only a fearless few have begun to engage in market-driven deposit taking and corporate and consumer lending. Less than 40 percent of Russian banks' loan portfolios consisted of credits extended for a year or more. Bank lending remained tied to the structures of Russia's financial-industrial groups, with intragroup credits accounting for an estimated 43 percent of total credit, and the government or leading domestic companies continue to run the largest banks.

The effects of the crisis will change the Russian banking sector, already triggering the consolidation of the banking system and start revealing the systematic problems. In time when liquidity shortages did trigger the Global financial turmoil, the main issue on the way to credit growth becomes the solvency problems, arising from the declining capacity of borrowers to repay bank loans. Banks risk breaching regulatory capital requirements if, as expected, the downturn brings an upsurge in non-performing loans.

Such capital shortages can force deleveraging as banks shrink their balance sheets to meet capital adequacy requirements. Banks may also be unwilling to lend as credit risks on new lending rise in an environment of negative real GDP growth both domestically and abroad. The challenge is to maintain capital adequacy and prevent a sharp curtailing of lending flows financing new activities, while minimizing moral hazard and the cost to taxpayers (OECD, 2009).

Despite somewhat improved liquidity conditions in April and May 2009, credit markets in Russia are expected to remain tight and nonperforming loans will increase towards the year end (likely over 10% on average). The current level of non-performing loans at many large banks has already reached 8 percent or higher, which may aggravate the still continuing confidence crisis. Given upcoming debt payments, some banks may require urgent recapitalization (Russian Economic Report, World Bank, 2009).

Another more general consequence is that some banks and corporations may have to revisit their business models. Banks who relied excessively on external borrowing as a mode of funding will need to revisit their business model and, as in other countries, move towards more traditional banking business and funding model relying on more stable and diversified deposit/client base. Also, given the ongoing, massive margin calls to private corporations on loans collateralized by volatile equity shares, corporate borrowing strategies as a business model should also be revisited (World Bank, 2009).

Figure 2.9: Russia Balance of Trade, 2000-2009, bln USD

source: Central Bank of Russia

www.tradingeconomics.com
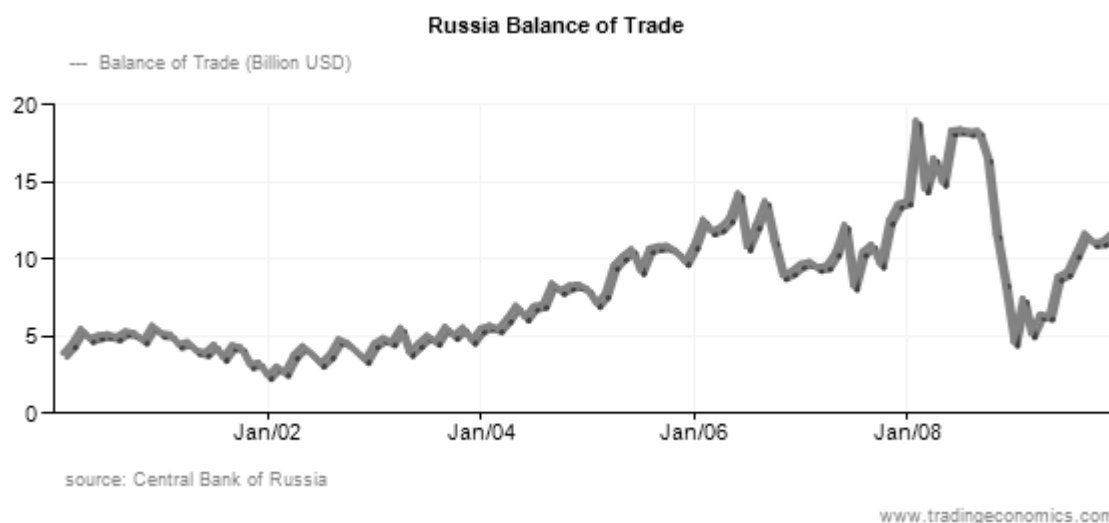
Oil and gas dominate Russian exports, so Russia remains highly dependent upon the price of energy. The majority of Russia's exports are made up by raw materials and fertilizers. Russia imports mostly vehicles, machinery and equipment, plastics, medicines, iron and steel, consumer goods, meat, fruits and semi finished metal products. Its main trading partners are: European Union (Germany, Italy, France), China and Ukraine. As it is shown on the graph above, the economic turmoil of 2008 resulted in a significant decrease of exports value, which declined Russia's balance of trade to the level of the year 2004.

Regarding Ukraine, there have been significant problems with financial sector and other industries. Shortening of exports and decrease of foreign capital inflows occurred in many developing countries, including Ukraine, as the crisis had started. Ukrainian economy is open and not well diversified; the export makes up 50% of the whole state's GDP. It consists mainly of goods with low value added, such as metallurgy and chemical production. Therefore, the incomes from the exports are highly depended on the world market prices. The goods with high value added as machinery and transport make up only 15% of the whole Ukrainian exports (Figure 2.10). Ukraine is exporting its materials and products mainly to Russia, Turkey, Italy, Poland, Belorussia and Germany.

Figure 2.10: Ukraine Exports/Imports, 2000-2009, mln. USD

Source: http://www.bank.gov.ua/
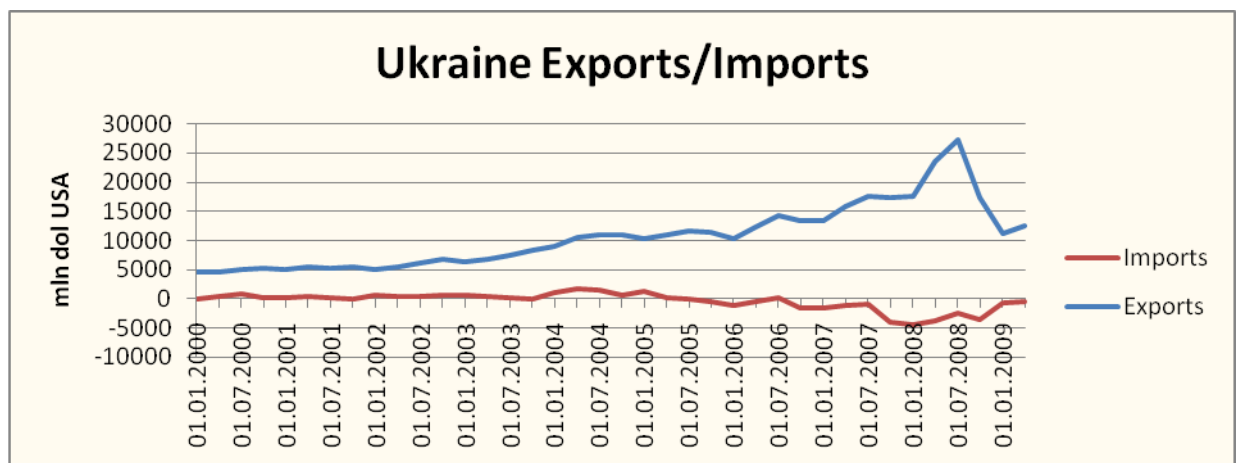
The graph above shows, that from 2003 the export had a positive growth, in absolute numbers it was growing from 10.000 mln USD in 2005 up to 28.000 mln USD in 2008. In 2008 the growth

rate of Ukrainian export was about 38%. That was the consequence of the fast development and strong economies of Ukraine's trade partners. However, the world financial turmoil resulted in declining the prices for raw materials and good, and lowered the demand, so already in the beginning of 2009 export has dropped significantly, to the level of the year 2006.

We should also mention that mainly natural resources were exported, but consumption and investment in the state were ensured by imported goods. Moreover, Ukraine is dependent on oil and gas, so it is importing the energy resources from abroad, mainly from Russia. The increase of import started from 2006 and was sharply growing till 2007. Growth rate of import in 2008 was as high as 40%.

The result of the mentioned above facts was negative current account balance in Ukraine. In 2008 current account deficit made up 7% of the GDP. The crisis of the liquidity made it difficult to finance such a great deficit and that led to the currency devaluation.

Figure 2.11: Ukraine External Debt in 2004-2009, mln USD

Source: http://www.bank.gov.ua/
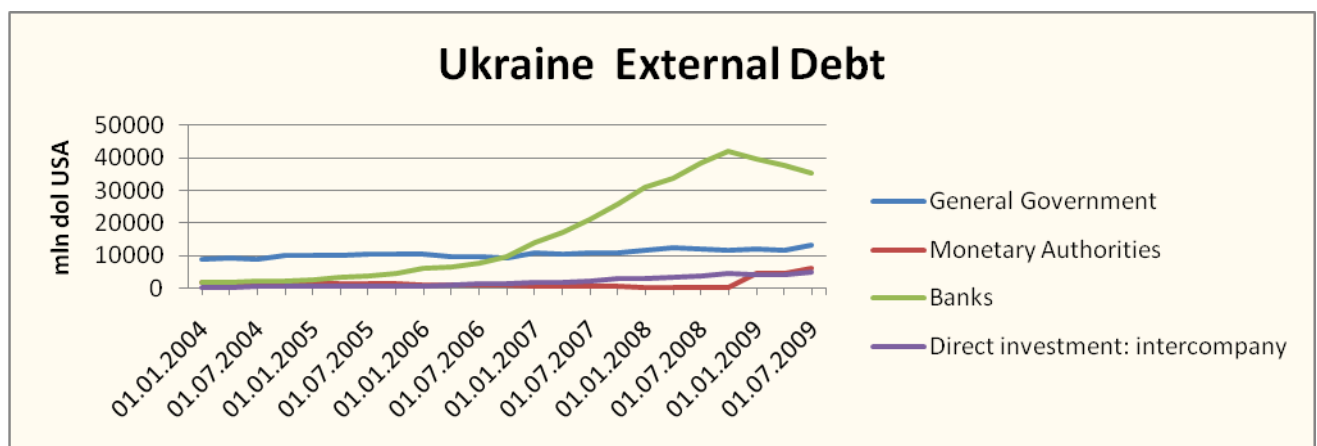
Another problem occurred in Ukraine when it had to pay back the external debt in a short period of time. From the graph above we can see the huge growth of the bank sector debt in Ukraine from 10.000 billion US dollars in 2006 till 41.000 billion US dollars in 2008. Ukraine had 35 billion dollars of currency reserves for refinancing of the external debt. That was impossible task at the beginning of the crisis and it was one more reason for the national currency devaluation again.

Devaluation as the consequence of the current account balance deficit was accompanied by huge external debt and the bank sector inefficiency. The decrease in export shortened the foreign currency inflows. The speculative demand for the currency started. State bank sold the foreign currency reserves to prevent from the devaluation. The monetary policy of the Central bank of Ukraine was not adequate and that set the distrust to its actions. Speculative actions continued. At the end of 2008 the national currency devalued by more than a half towards USA dollar.

The problems with the bank sector and not consecutive monetary policy led to the reduction of the real sector crediting. GDP in Ukraine fell by 14% in 2009. That was the reason for the consumption and investing turmoil. Ukrainian banks could not borrow from the external markets. The amount of national currency Hryvna credits grew just by 10% at the end of 2009. That is less than a half than the previous year. The amount of credits in the foreign currency has decreased by 14% in 2009 compare to 30% increase in 2008. Sectors which are dependent on the borrowed money experienced a significant deterioration in their activity. Metallurgy, chemical production, trade and constructing are the sectors which suffered the most. Mashine-building experienced 41% decrease over the previous year. Mining and quarring of energy producing minerals experienced with 6% decrease over the previous year.

Strengthening of the world economy in the second half of 2009 advantaged a faster recovery of Ukrainian economy. Industries' slowdown changed from 34% in January 2008 to 23% in August 2009.

As a conclusion to this part we would like to stress that in the pre-crisis period, both Ukraine and Russia were having positive trend in all the overview spheres. There was also an increase in the social indicators, decrease in the level of corruption etc. However, the world financial turmoil resulted in the slowdown of the most countries' industries and their financial stability. Therefore, there is a need in a further development of the countries economics, and we think, that such a force can be found in saved labor force from premature death.

Chapter 3
Demography in Russia and Ukraine

Demography is a science about physical characteristics of population, its dependence on social and economic conditions, environment, migration, and studies size of population, its changes, causes and consequences of such changes, and gives recommendations on improvements (Business Dictionary, 2010). Demography's central objective of analysis is a reproduction of population, and as a result, birth rates, mortality rates, natural growth of population rates, age of population, sex, education, occupation, marital status, and fertility rates.

In the past two decades Ukraine and Russia have been experiencing an adverse demographic situation. The population size decrease is an important and essential concern for both countries. Since the fall of the Soviet Union in 1991, the mortality rates have exceeding the birth rates in these countries, and there has being a continuous and stable decrease of the size of population since 1993.

There are numerous of indicators that are worth to mention and to analyze, however we will focus on the main ones, such as total number of population, rates of natural growth of population, birth and mortality rates, life expectancy, and causes of death. We believe, this will keep the analysis clear and smooth, easy for understanding and following the main idea of the thesis.

In the first part of this chapter we will describe the general characteristics of demographic situation in Ukraine and Russia. Then, in the second part, we will focus on the rates of natural growth of population, which is crucial as these are the lowest indicators among all the European Countries, and on life expectancy issues. In the third part we will describe the main causes of premature death and bad health status of population. And in the end we will provide some empirical evidence on influence of high mortality on economic growth.

3.1 General Characteristic of Demographic Situation in Russia and Ukraine

Russia's and Ukraine's demography situations are rather similar (see figure 3.1) and very critical. Compare to other European countries, Ukrainian and Russians not only die younger, but also live less years in a healthy condition (World Bank, Working Paper 51829). Moreover, high death rates of men cause serious economic and social problems.

According to official statistics, the population size of Ukraine has decreased from 52.2 million in 1993 to 46.1 million in 2009, which is 6 million people, or 11.6% decline. The population of Russia has also decreased: from 148.6 million 1993 to 141.9 million in 2009, which is 6.7 million or 5% of the initial population size (see Appendix 2, Table A.2). The graphical representation can be found in Figure 3.1 below.

The main reasons for such a negative demographic tendency are: growing emigration, falling fertility rates, increasing mortality rates, especially among working men as a result of non-infectious diseases (Ministry of Health Care of Ukraine, 2009).

Figure 3.1: Population of Russia and Ukraine, 1990-2009, mln people

Source: Russian Federal State Statistics Service, State Statistics Committee of Ukraine

According to recent World Bank's Working Paper, 20 percent of population decrease is caused by emigration. Nevertheless, forecasts presume decline in emigration tendencies in the future years.

Another important reason for such a quick decline in population size is the decrease in fertility rates. As Ukrainian State Statistics Committee reports, fertility rates have decreased from 1.9 children per woman in 1982 to 1.2 in 2008. This might be explained either by the demography trend change as it was in Western Europe, or by the crises of transition economy with all the political, moral, and economic consequences (Frantsuz, 2008). The most probable factor is the negative results of transitory crises. Rural areas are getting depopulated since 1970th, women are becoming more educated and want to give birth in an older age, they got better accessibility to contraception, and the social and economic environment do not stimulate to have children in an early years, or to have many children in general.

3.2. Natural Growth of Population in Russian and Ukraine

As we have mentioned, besides having low fertility rates, there is a stable tendency of high mortality rates, thatobviousely exceed the birth rates. This, therefore, results in negative natural growth of population in general (Table 3.1).

Table 3.1: Population Growth Rates of Russia and Ukraine, 2000-2008, per 1,000 population

	Russia			Ukraine		
	Birth Rate	Mortality Rate	Population Growth Rate	Birth rate	Mortality Rate	Population Growth Rate
2000	8,7	15,3	-6,6	7,8	15,3	-7,5
2001	9	15,6	-6,6	8	15,6	-7,1
2002	9,7	16,2	-6,5	8,1	15,7	-7,6
2003	10,2	16,4	-6,2	8,5	16	-7,5
2004	10,4	16	-5,6	9	16	-7
2005	10,2	16,1	-5,9	9	16,6	-7,6
2006	10,4	15,2	-4,8	9,8	16,2	-6,4
2007	11,3	14,6	-3,3	10,2	16,4	-6,2
2008	12,1	14,6	-2,5	11	16,3	-5,3

Source: Rosstat, State Statistics Committee of Ukraine

Birth rate is a number of childbirth per 1000 people per year. Death rate, or mortality rate, accordingly, is a number of deaths per 1000 people per year. The difference between these two indicators equals to the natural population growth rate.

As the table above shows, both Russia and Ukraine have negative rates of natural population growth. Especially critical situation is in Ukraine. It has the lowest population growth in Europe, and it equals to -5.3. Since year 2000, the situation has improved a little, and negative growth increased from -7.5 to -5.3, however, it is still very low indicator. In most of the European countries it is close to zero, and still most of the countries are stimulating birth rates to increase and mortality rates to fall.

Figure 3.2 shows these trends of negative population growth of Ukraine and Russia. Having 12.1 births per 1000 of population in Russia, there was a mortality rate of 14.6, which in the end resulted in negative population growth rate of -2.5 people per 1000 of population in the year 2008. It is worth to mention, that situation in Russia has improved only during last two years, when there were implemented new family programs aimed at increasing birth rates. And it worked out. Birth rates increased from 10 in the mid of 2000s to 12 births per 1000 people in 2008.

Figure 3.2: Natural Population Growth of Ukraine and Russia, 1990-2008, per 1,000 of population

Source: Rosstat, State Statistics Committee of Ukraine

Ukraine does not have as straightforward tendency for improvement. Population growth rates are far below zero, and any changes seem to influence the situation very slowly.

High mortality rates are explained mostly by high mortality of men in working age (Figure 3.3). The probability to live to the retiree age is very low for Ukrainian and Russians. Number of deaths of men and women per 1000 people seriously exceeds the corresponding rates of Czech Republic, Poland, Hungary, and Slovenia.

Figure 3.3: Age-Specific Mortality Rate: number of deaths of people
between 15 and 60 years per 1000 people, 2008
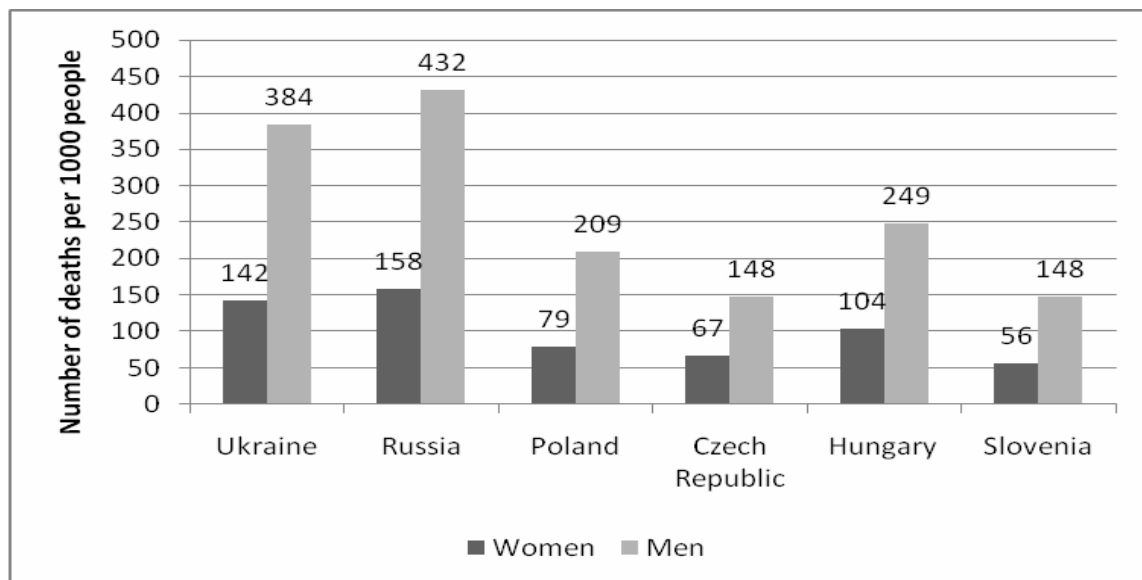
Source: World Health Survey, 2008.

As World Health Survey reports (2008), being a Russian man, there is a 432 out of 1000 chance (or probability of 0.43) to die before age of 60. Being a Ukrainian man, there is a 384 out of 1000 chance (probability equals to 0.38) to die before age of 60. This is an extremely high numbers. For instance, in Czech Republic this rate equals to only 148 per 1000 for men, and 67 per 1000 for women.

Life expectancy at birth of Russians and Ukrainians is also extremely low, and on average it is well below the European life expectancy level: for about 10-12 years (World Bank, 2009). For

instance, an average person in Ukraine and Russia is expected to live 68 years, while in Germany and the Netherlands this indicator is equal to 79 years. In Scandinavian countries this number is even higher. The main reason for such a low life expectancy in post-Soviet countries is mostly a premature death of economically active population due to non-communicable diseases, such as cardiovascular diseases and neoplasm, and accidents, mostly traffic accidents (Pirozhkov, 2006).

Figure 3.4: Life Expectancy of Population of Russia and Ukraine, 2000-2008, years
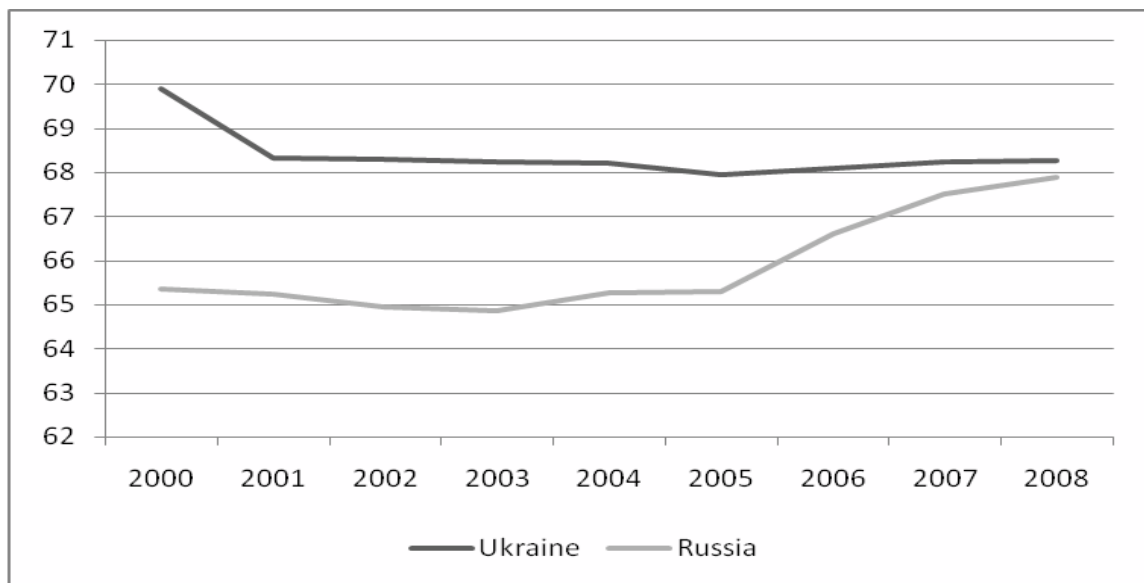
Source: Rosstat, State Statistics Committee of Ukraine

Therefore, the global development agenda – Millennium Development Goals – is not perfectly suitable for the eastern European countries. Work Bank reports show that reducing number of cardiovascular diseases and accidents would improve a life expectancy much better, than achieving health related Millennium Development Goals, such as decreasing child and maternal mortality, reductions in HIV/AIDS, and tuberculosis (Lock, 2002).

The biggest problem though, is extremely high men mortality. In most of the cases, men can hardly survive to their retirement age. Both for Ukraine and Russia a retirement age is 60 years for men, and 55 – for women. However, as Table 3.1 shows, an average man lives only till 61-62 years. As World Bank reports, the probability to die at the age 15-60 for man is 40%, which is incredible in any case. For woman this indicator is only 15%. However, average European number is about 10-15% for man, and 8% for woman (World Bank, 2007). Moreover, the

countries with lower economic development have higher chances for their citizens to live longer.

Table 3.2: Life Expectancy of Population of Russia and Ukraine in 2000-2008, years

	Russia			Ukraine		
	Total	Men	Women	**Total**	Men	Women
2000	**65,34**	59,03	72,26	**69,91**	62,44	73,55
2001	**65,23**	58,92	72,17	**68,33**	62,77	74,08
2002	**64,95**	58,68	71,9	**68,32**	62,70	74,13
2003	**64,85**	58,55	71,84	**68,24**	62,24	76,06
2004	**65,27**	58,89	72,3	**68,22**	62,60	74,05
2005	**65,3**	58,87	72,39	**67,96**	62,23	73,97
2006	**66,6**	60,37	73,23	**68,10**	62,38	74,06
2007	**67,51**	61,39	73,9	**68,25**	62,51	74,22
2008	**67,88**	61,83	74,16	**68,27**	62,51	74,28

Source: Rosstat, State Statistics Committee of Ukraine

Such a high mortality has significant social consequences. Even young people are suffering from non-communicable diseases, such as cardiovascular diseases, but in much higher scale than it is in Western Europe. For instance, the mortality rate of retirees in Russia compare to Sweden due to cardiovascular diseases is 2-3 times higher, whereas for the age category from 30 to 34 years old – 12 times higher (WHO, Regional Office for Europe, 2006). The mortality rate in Russia compare to Sweden due to accident is 3-4 times higher for retirees, and 8-9 times higher for economically active population.

The difference in health between Eastern Western Europe is even more evident while comparing the levels of morbidity (sickness rate). Analysis of healthy life expectancy, i.e. life expectancy without chronicle diseases and disabilities, shows that women also suffer from bad health in an economically active age. This is not clearly visible from death rates, but definitely evident from disease rates (Suhurcke, 2007).

As a result, we see that from bad health in Russia and Ukraine suffer not only retirees, but also economically active population. Even this epidemiological data presume that bad health of the population is influence economic indicators negatively, both on individual level and state level.

3.3. Causes of Mortality

In Ukraine and Russia, as in most other countries, non-communicable diseases are the most frequent causes of death. Non-communicable disease is a non-infectious disease, which might be caused by risk factors, such as lifestyle, genetics, or environment. Examples of non-communicable disease are heart disease, cancer, diabetes, strokes, etc. As to Ukraine and Russia, diseases of circulatory system (cardiovascular diseases) are the leaders of causing the mortality. To most frequent group of factors causing non-communicable diseases, there can also be included a neoplasm (cancer). The second most frequent group of factors causing premature mortality is a set of external causes, such as injuries, poisoning, and accidents.

Table 3.3: Russia Mortality Rates by Main Classes of Causes of Death
(deaths per 100 000 population), 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total deaths by all causes	**1529**	**1568**	**1617**	**1644**	**1596**	**1610**	**1521**	**1464**	**1467**
Diseases of circulatory system	846	857	907	928	895	908	865	834	833
Neoplasm	205	204	203	203	202	201	201	203	203
Accidents, poisoning, injuries	219	230	235	234	227	221	199	183	165
Diseases of respiratory system	70	70	70	71	65	66	58	55	55
Diseases of digestive system	44	47	52	57	59	66	63	62	63
Infections and parasitic diseases	25	25	26	26	26	27	25	24	24

Source: Federal State Statistics Service, April 2010

Cardiovascular diseases caused 57% of deaths in Russia and 64% in Ukraine in 2008 (Federal State Statistics Service, Ministry of Health of Ukraine). In absolute numbers it equals to 8.3 incidents per 1000 people and 10.4 incidents per 1000 people in Russia and Ukraine respectively (Table 3.3). Cardiovascular diseases include ischemic disease of heart and strokes (cerebrovascular accidents), and might be caused by smoking, alcohol consumption, drug addiction, poor environment, stress, genetics etc.

Figure 3.5: Mortality by Causes, Russia, 2008
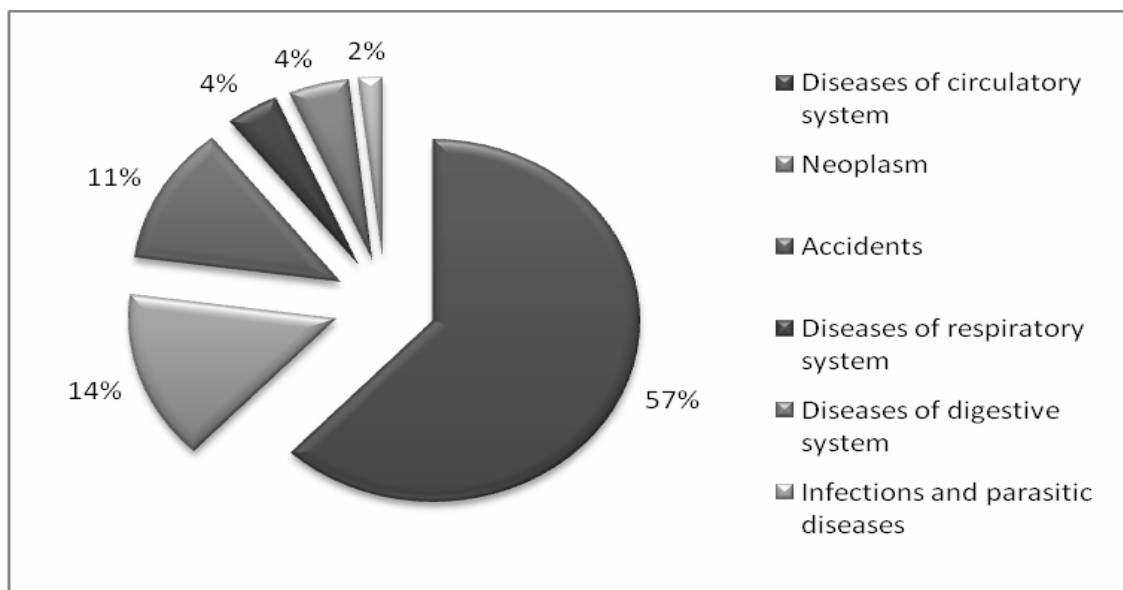
Source: Source: Federal State Statistics Service, April 2010

Cancer, or neoplasm, in Russia and Ukraine is notable by a very high lethality, especially in young age groups. Moreover, men are more cancer-prone, there twice more men dying because of cancer than women. Mostly, those are lung cancer for men and breast cancer for women. Another interesting fact is that while in the rest of the Europe these indicators are declining, in Ukraine they are raising (World Bank, Working Paper 51829). In Russia and Ukraine there are respectively 14% and 12% of deaths caused by cancer (Figure 3.5, 3.6). In absolute number those are 2 cases per 1000 people in Russia, and 1.9 cases per 1000 people in Ukraine in year 2008.

Table 3.4: Ukraine Mortality Rates by Main Classes of Causes of Death
(deaths per 100 000 population), 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total deaths by all causes	**1526**	**1533**	**1566**	**1601**	**1604**	**1660**	**1620**	**1640**	**1631**
Diseases of circulatory system	928	940	965	1001	998	1038	1028	1033	1038
Neoplasm	194	196	197	195	194	195	193	194	192
Accidents, poisoning, injuries	151	155	158	152	150	149	138	142	133
Diseases of respiratory system	70	69	66	63	60	59	53	54	50
Diseases of digestive system	45	46	48	52	59	67	65	72	76
Infections and parasitic diseases	28	28	27	29	32	37	35	36	37

Source: Ministry of Health of Ukraine, April 2010

The second biggest group of factors is the accidents, poisonings, and injuries. There are also included accidental injuries, suicides and murders, accidents in water and fire. This group of factors takes 8% and 11% of total mortality in Ukraine and Russia respectively. Mostly, they are cause by road accidents, and alcohol poisoning. On average, in Ukraine there were 1.5 cases per 1000 population annually from 2000 to 2008, while in Russia – about 2 cases per 1000 for the same period.

The other reasons of mortality in the analyzed countries are:

- diseases of respiratory system: 3% in Ukraine, 4% in Russia;

- diseases of digestive system: 5% in Ukraine, 4% in Russia;

- infections and parasitic diseases: 2% in Ukraine, 2% in Russia.

Figure 3.6: Mortality by Causes, Ukraine, 2008
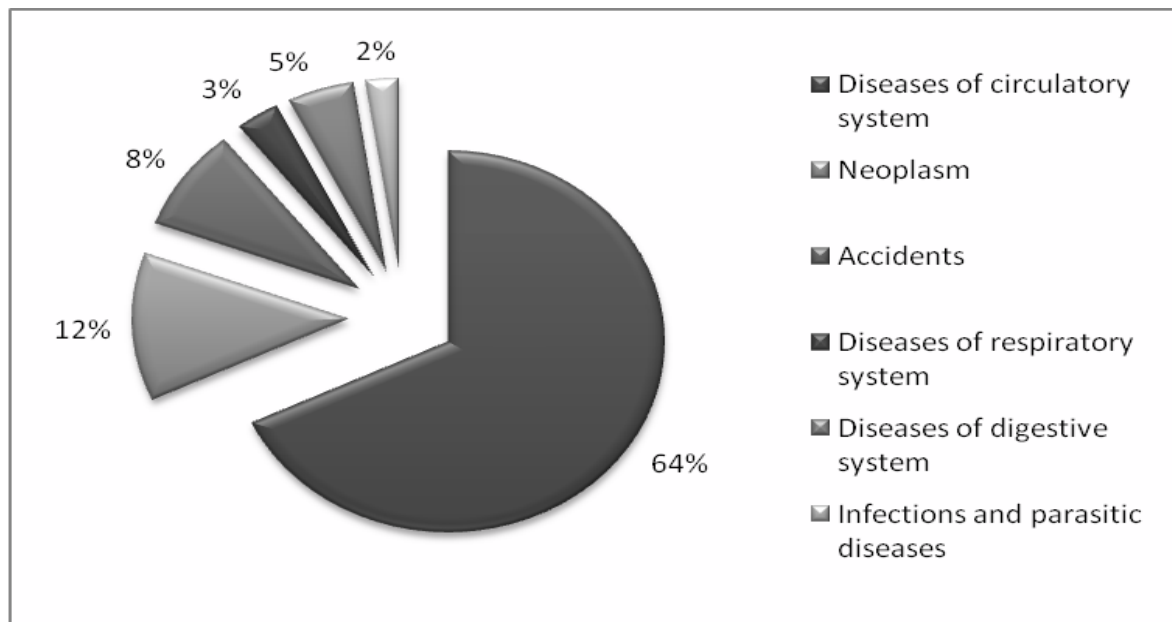
Source: Ministry of Health of Ukraine, April 2010

Mortality caused by high alcohol consumption (including mental diseases because of drinking) in Ukraine was the second highest after Estonia among all the Europe in 2004. In 2005 6.4% of mortality caused by accidents, were due to murders, and was equal to 9 incidents per 100,000 people. It is 8 times higher that European Union number. Most of such murders are performed being drunk. In 2005 in Ukraine mortality caused by traffic accidents was 20 people per 100,000, against only 13 people per 100,000 in 1999.

It is obvious from the diagrams above, that the main reasons of high mortality are cardiovascular diseases and neoplasm. Moreover, these are so called non-communicable diseases, which are mostly cased by life style, environment, and nutrition. Thus, it is possible to influence these factors so to decrease mortality rates, and save human lives.

3.4 Consequences of bad health and high mortality rates for the economy

Ukrainian and Russian labor markets are shrinking as a result of high emigration, high mortality rates of working age population and low fertility rates. Demographic studies report a decline of a share of working age population (15-60 years) in a total population of Ukraine and Russia. Premature death of unqualified and qualified workers can negatively influence not only households' incomes, but the state economy as a whole. Worsening of health status leads to decrease of labor productivity, as a result of missing working days and declining potential of workers. Correspondingly, improving of health can lead to activation of economic activity. If people expect to live long life, they are motivated to save more. Saving, by turn, is a direct source for investment, and therefore, development of the economy.

There was a research made by Bloom et al. (2004) that showed that one additional year of life increases GDP per capita for about 4 percent. However, this was an evidence for developed countries. In developed countries, where economic policy is effective and government running is stable, the problems of improving health quality are vital and solvable. But we are talking about developing transitory states.

Let us model the production function and a growth model, as was described in chapter 1, formulas 1.3 and 1.4. We will use variables of investment as a percentage of GDP, number of economically active population as a labor force without number of unemployed, and as a measure of human capital we will use average life expectancy in a particular country; estimation of the model is done by pooled ordinary least-squares (OLS) model. The results are in table 3.5 below.

The coefficient of human capital is negative that shows that increase in life expectancy for 1 year results in a decrease in GDP by 0.08 percent. Nevertheless, the coefficient is statistically insignificant even at 10% level. The coefficient of labor, as a factor of production, is positive, but also insignificant. Still, an increase in labor force by 1 million people results in 0.001 percent increase of GDP, that is economically insignificant. The only significant coefficient is the coefficient of capital, i.e. investment as a share of GDP. It shows that 1 percentage point increase in investment gives 0.24 percent increase in GDP.

Table 3.5: Results of Pooled OLS for Ukraine and Russia, 2000-2008

Model: Pooled OLS, using 18 observations, Included 2 cross-sectional units
Time-series length = 9. Dependent variable: l_GDP

	coefficient	std. error	t-ratio	p-value
const	6.76997	4.35045	1.556	0.1420
Inv_GDP	0.235577	0.0233797	10.08	8.50e-08 ***
Labor	0.00137845	0.00535616	0.2574	0.8006
Life_exp	-0.0817515	0.0640412	-1.277	0.2225

Mean dependent var	5.207819	S.D. dependent var	1.161851
Sum squared resid	0.618568	S.E. of regression	0.210199
R-squared	0.973045	Adjusted R-squared	0.967269
F(3, 14)	168.4621	P-value(F)	3.21e-11
Log-likelihood	4.795583	Akaike criterion	-1.591167
Schwarz criterion	1.970320	Hannan-Quinn	-1.100086
rho	0.151501	Durbin-Watson	1.643404

Our model has described 97 percent of data, which is probably a problem of multicollinearity. This very strong linear relationship may indicate a bias in our model. Nevertheless, even considering the coefficients, their values and insignificance, these results are of no help for our analysis.

Logically thinking, increase in economically active labor should result in some positive influence of the growth of GDP. As to human capital coefficient, that we proxy with life expectancy, it also gave no statistical dependence with GDP, most probably because of the fact, that the analyzed period is too short, or because of much faster increase in GDP than any changes in life expectancy can occur.

The best explanation for such results is that during economic transition there are more important factors that explain economic growth, like implementing new technologies, structural changes of the economy and shifting to more efficient production. Moreover, as to Russia, main reason for such a significant increase of GDP was an increase of oil and gas price. Being dominant in supplying oil and gas to Europe and post-soviet countries, Russian economy had reached enormous rates of GDP growth, up to 9 percent per annum.

Let us now describe how much in terms of share of GDP Russian and Ukrainian economies lose because of prematurely dying population.

Now we will calculate how much would economies of Russia and Ukraine safe, in case of having such a mortality that will result in a zero population growth rate. Taking into account that mortality rates of these countries are the highest among European, life expectancy is also very low, but fertility rates are approximately the same, we assume that the better way to achieve the goal is not to increase birth rates, but reduce mortality rates.

Table 3.6: Calculation of possible amount of income that saved from premature death people could bring to the economy, Ukraine, 2000-2008

	GDP, bln $	Working minus unepmloyed, mln people	GDP/(Working-unempl. population), $/person	Population decline, thous ppl	Loss of negative population growth, billion $	Share of GDP, %
2000	31,26	26,59	1175,5	-374,3	-0,44	-0,014
2001	38,01	26,48	1435,5	-396,5	-0,57	-0,015
2002	42,39	26,36	1608,0	-364,2	-0,59	-0,014
2003	50,13	26,16	1915,9	-356,8	-0,68	-0,014
2004	64,88	26,06	2489,9	-334,0	-0,83	-0,013
2005	86,14	26,35	3268,7	-355,9	**-1,16**	-0,014
2006	107,75	26,25	4105,5	-297,7	**-1,22**	-0,011
2007	142,72	26,16	5456,6	-290,2	**-1,58**	-0,011
2008	180,36	26,09	6912,5	-243,9	**-1,69**	-0,009

Considering the data from Appendix 3 (Table A.3.1 and Table A.3.2), we are making the new table with calculation. First we calculated the number of economically active population, which is total population multiplied by labor force participation rate (the proportion of the population ages 15 and older that is economically active: all people who supply labor for the production of

goods and services during a specified period. Source: International Labor Organization, Key Indicators of the Labor Market database), with number of unemployed subtracted.

We took total GDP number and working population of the country excluded uneployed, and calculated GDP per working person. GDP per capita is not of interest for this calculation, as we are interested in the loss caused by premature death of economically active population. Assuming that: (1) every working person contributes to GDP on average the same amount, (2) reducing population growth rate from negative to zero level, we are saving only working population, i.e. only mortality of working population is improved, (3) every saved from premature death person is healthy enough to contribute to state's economy. Then we multiply amount of money every average person brings to the economy on the potentially saved labor force, and get the amount that state could get as an additional GDP (see Table 3.6 and 3.7).

Table 3.7: Calculation of possible amount of income that saved from premature death people could bring to the economy, Russia, 2000-2008

	GDP, bln $	Working minus unemployed, mln people	GDP/(Working-unempl.), $/person	Population decline, thous ppl	Loss of negative population growth, billion $	Share of GDP, %
2000	195,91	80,03	2447,8	-958,5	-2,346	-0,012
2001	259,71	80,77	3215,5	-943,3	-3,033	-0,012
2002	306,6	81,54	3760,3	-935,3	-3,517	-0,011
2003	345,71	80,93	4271,7	-888,5	-3,795	-0,011
2004	431,49	80,83	5338,1	-792,9	-4,233	-0,010
2005	591,74	81,50	7260,9	-846,5	**-6,146**	-0,010
2006	746,53	82,03	9101,1	-687,1	**-6,253**	-0,008
2007	990,58	83,85	11813,3	-470,3	**-5,556**	-0,006
2008	1290,08	83,65	15422,2	-362	**-5,583**	-0,004

Tables above show that decreasing mortality until the zero population growth rate, the countries would theoretically get additional outcome that those saved people would produce, which would approximately equal to 5.9 billion US Dollars annually for Russia, and 1.5 billion US Dollars annually for Ukraine, taking into account recent 4 years (from 2005 to 2008).

Considering these amounts as shares of GDP, it would on average bring about 1 percent of GDP extra. One could say that it is rather low result, and that in a short run a state of transitory economy is not interested in investing into the health of its population. However, it has to be stressed, that in a long run it would cause significant problems, such as depopulation, shortage of labor force, low productivity, higher health care expenses, low investment, and, as a result, economic decline.

Therefore, it is crucial for the governments to understand long run priorities, and besides of financing health care, also promoting healthy lifestyles, limiting cigarette and alcohol consumption.

Chapter 4
Policies against Premature Death in Russia and Ukraine and Future Development of the Countries

In this chapter we are going to discuss main tendencies of further demographic situation in Ukraine and Russia, and possible policies against high mortality and low fertility rates in these countries.

As situation is seems to be critical due to extremely fast decrease in population size of these two countries, we would suggest some low-cost policies for preventing Ukraine and Russia from demographic catastrophe.

4.1 Important Facts

According to Ukraine's and Russia's law, every person has a right to health care and free of charge medical aid. Funding of the health care system is provided by a state, however financing is never big enough to maintain efficient provision of medical services. As World Bank reports, in 2007 the network of health system in Ukraine counted 225 thousand doctors which is 4.8 per 1,000 population, and 4.6 doctors per 1,000 population in Russia. However, such a high number does not represent the real state of the health care. Crucial matter is financing of the sector (Health Survey, 2007).

Public health systems of Ukraine and Russia were inherited from the Soviet Union past, together with poor technical equipment, low financing, and with people believes that health care has to be free of charge. Since 1990 politicians, physicians, and economists have been trying to convince average citizens that introducing obligatory medical insurance system is a need because of lack of financing from state funds. However, none of the means and attempts was successful, and people are protesting against any significant changes in funding system of health

care. Therefore, there is still a problem with adequate funding system, which is unable to maintain public health system.

Taking into account the fact that Ukraine's and Russian's financing of health care not just among the lowers in Europe, but it is 4 times lower compare Czech Republic, and 8 times lower compare to Germany. In year 2007, health expenditures per capita in Ukraine were only 298 US Dollars, in Russia – 404, in Czech Republic – 1309, and in Germany – 2548 US Dollars per capita (Figure 4.1).

Figure 4.1: Health Expenditures per capita, 2007, USD
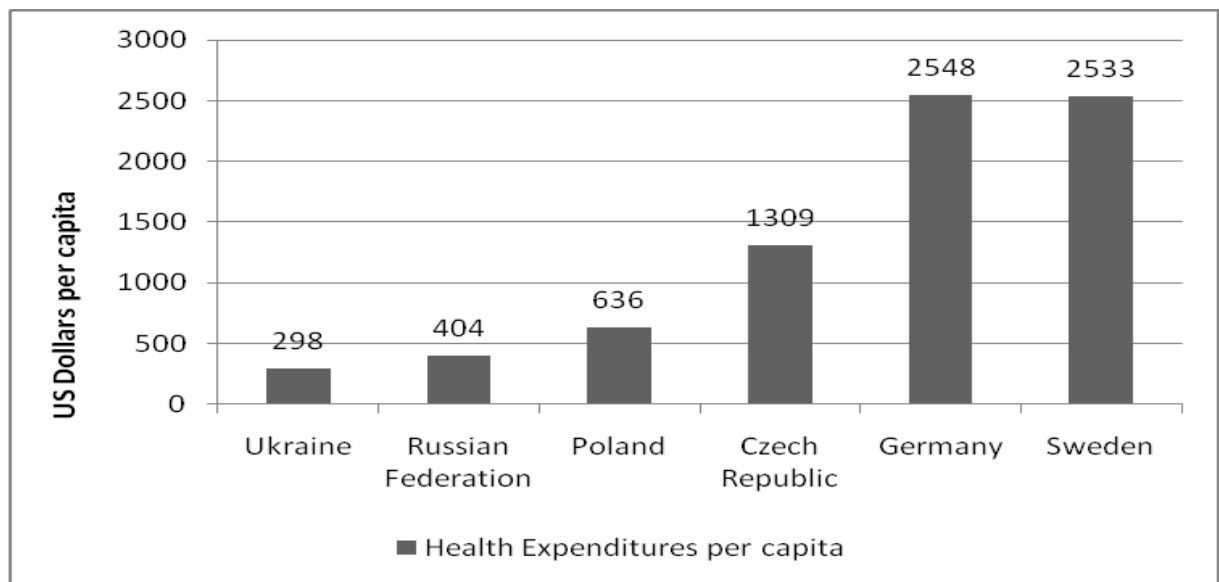
This is a definite indicator, that health care in Ukraine and Russia is financed insufficiently not enough, and governments of respective countries should change their attitude towards appropriate funding.

According to World Bank Working Paper 51829 "An Avoidable Tragedy: Combating Ukraine's Health Crisis – Lessons from Europe", the top causes leading to different classes of mortality are:

1. High Blood Pressure

2. High Cholesterol

3. Smoking Cigarettes

4. Alcoholism

5. Obesity

6. Poor nutrition

7. Lack of physical activity

8. Drug Addiction.

Considering this reasons of mortality, it is obvious that the government is able to influence this causes by appropriate measure, which we discuss in the next chapter. However, is it possible in such a politically unstable Ukraine? Or business oriented Russia?

4.2 Policies for Prevention and Control of Risk Factors

Health of the person depends not only on health care system. There are also such factors as genetics, environment, and lifestyle that influence health status and possibility of mortality. Non-communicative diseases are not the results of poor health care system. These kinds of diseases demand measures in improving of social health, environment, behavior, and for treatment – adequate health care. The latter is in a poor condition in Ukraine and Russia, and most of the post-Soviet states. Therefore, the main attention has to be driven to prevention of causes of mortality and morbidity, and adequate treatment.

Basic measures against main risk factors can give significant improvement in health of population, having quite low expenses. These measures were proposed by World Bank Working Paper 51829 "An Avoidable Tragedy: Combating Ukraine's Health Crisis – Lessons from Europe":

1. Control of Smoking (political and administrative measures, anti-tobacco campaigns):

   - prohibition of advertisement;

   - increase of taxes on cigarettes;

   - warnings of damage for health;

   - anti-tobacco education at school.

2. Control of Alcohol Consumption:

   - anti-adverts;

   - increase of taxes on alcohol;

   - law measures (obligatory warns about not selling alcohol to under-age, harm of alcohol;

   - anti-alcohol campaigns at schools.

3. Improving of road traffic:

   - obligatory fasten seatbelts

   - prohibition to drive under alcohol intoxication

   - strict speed limits

   - campaigns at schools about basic rules on the road

4. Nutrition and physical activity (Program "Health of the nation" 2002-2011, approved be Cabinet of Ministers of Ukraine) – however, slow and inconsistent:

   - health education at school

   - warns of obesity

   - development of sport activities, sport clubs

5. Screening of diseases:

   - Qualified personnel to diagnose the disease

   - Campaigns of screening.

These measures are considered to be low-cost in terms of implementation, because the main idea is to enlighten people on healthy life-styles, to instruct them on the possible diseases and mortal consequences as a result of consuming alcohol and tobacco, or of being careless while driving.

4.3. Future Development of the Countries

Taking into consideration the difficulties connected to any forecast, we will still try to find in the literature the most reasonable projections of macroeconomic indicators and demographic statistics. Ukraine's and Russia's nearest future perspectives will be discussed.

Regarding macroeconomic indicators, most of them experienced a significant stress during 2008-2009 financial crises. Attempts to find a solution for the crisis and further development for the countries, economists and analysts were developing economic stimulus packages to address the economic downturn. As to Russia, analysts did not insist on immediate diversification away from oil for Russian economy. The main idea was to begin with diversifying within their own oil market, allowing more small and medium-size energy companies to operate in Siberia (Gottemoeller, 2009). Diversification of such a crucial industry would not only improve Russia's energy business, but would also serve as an important first step in a larger diversification process.

As to predictions of Russia's economic development, World Bank expects only 3.2% growth of GDP in 2010, and a slow recovery throughout 2010. Russia's biggest challenge remains the rapid restructuring of the the economy to reduce dependence on exports before the financial aftershocks in the future. World Bank also says that the prospect is uncertain because most non-export sector of Russia does not depend on foreign markets and continue to suffer from weakening demand for consumer credit and the ability to be limited processing.

Regarding predictions of Ukraine's further development, World Bank supposes GDP growth of 2.5% n 2010 that is expected mainly due to improved export demand. Stress in the global financial conditions is expected to slow down the pace of recovery. Strained private sector finances will constrain investment, while continued labor market adjustment and cost cutting strategies in the corporate sector will weigh down on consumption demand. World Bank expects inflation to fall to below 14% by end-2009 and to below 11% by end-2010.

Demographic projections of different Russian and Ukrainian institutions, and numerous authors experience quite the same trends. Projections made before the mid of 90th of XX century were rather optimistic, compare to recent ones which assume Russian and Ukrainian population to decrease gradually further and further. Due to extremely high mortality rates, low fertility rates, high emigration, and low quality of life, - positive tendencies in population growth are hardly possible in the next decades.

United Nations projections up to year 2050, based on assumption for life expectancy and migration, shows negative dynamics in total population size (UN World Population Prospects, 2008). Moreover, for Ukraine decrease in population size will be more rapid, determined by the assumptions of high annual migrations (100 thousand for Ukraine, 50 thousand for Russia), lower fertility rates than for Russia, but higher life expectancy. Therefore, by 2050 Russia's population can decrease by 24% compare to population size in 2000, to 116 million people; Ukraine's – by 46%, to 35 million people (figure 5.1).

Figure 5.1: Total Population, Ukraine and Russia, 2000-2050, million people
(UN World Population Prospects, the 2008 Revision)
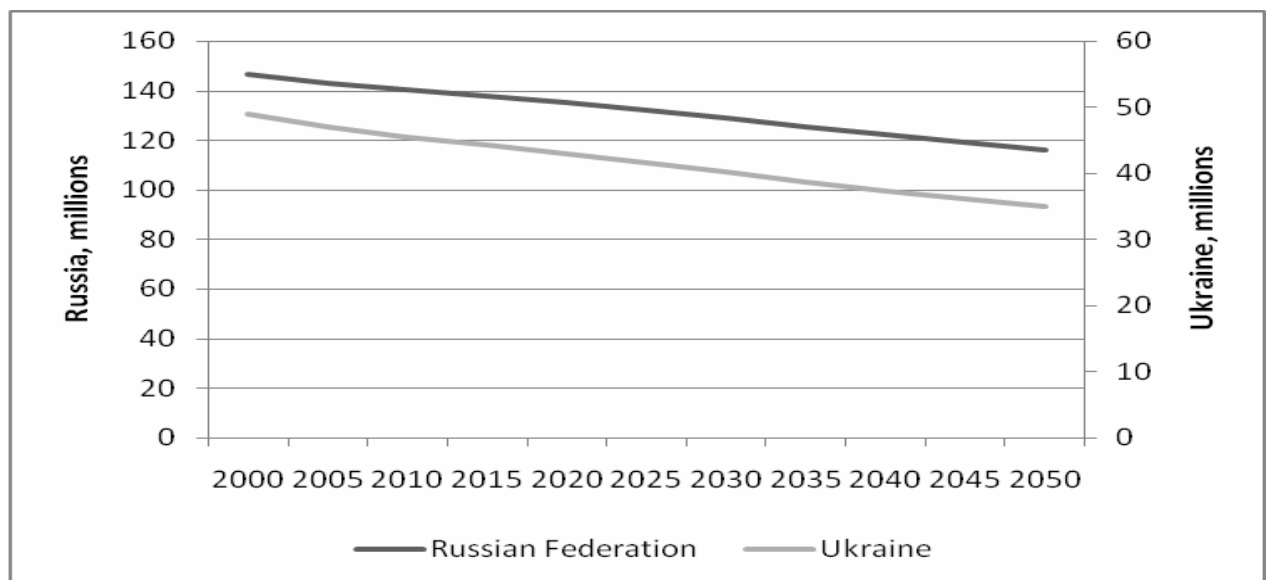
Source: United Nations, 2010

The demographic projection seems to be very negative for the countries, as it is not only loosing labor force that can produce additional output, but it is also loosing of personalities, human beings, which can potentially live longer.

Besides significant demographic decrease, there is also a big health crisis in Ukraine and Russia. Fast decline in a population size is due to decrease in fertility rates, increase in emigration, and mortality rates. Especially significant is a decline in a working age population, especially among male part of the population.

Decrease in a population size is explained mainly by non-healthy lifestyle. The main factors that cause cardiovascular diseases and poisonings are smoking, alcohol consumption, bad nutrition and poor environment.

However, it can be changed. Correct preventive measures and appropriate treatment system of health care can take under control most of the risks that cause mortality. Increasing economic performance of the countries is one of the ways, as it will lead to better financing of the health care system. Moreover, preventive measures taken by governments, such as increase of taxes on alcohol and tobacco, and other non-healthy products, and propagating healthy lifestyle can also improve things for better.

Last, but not least, is the appropriate financing of the health care system. In case the governments of Ukraine and Russia can mobilize financial resources and direct them to the health care, it can save a lot of lives and prevent a lot of serious diseases.

So far, Ukraine and Russia had not implemented any significant reforms to health care system, so to change the health care situation considerably. There are a lot of plans and perspective ways of development, however, not all of them are going to be realized. Most serious problems in this case are low financing and absence of experience. There is also a chance to find international partners for cooperation in this sphere; however, no steps are made in this direction.

The biggest problem, though, is that there is not enough of quality in health care system, from equipment to the organizational structure, it is not effective, overregulated, and the system has the doctors which are paid the lowest salary among all the sectors of the economy.

It is definitely not easy task for the government to provide effective measures for improving health care system with a further projection of improvement population health. However, governments have to take care about its population, so to maintain further development and improvements in all the spheres.

Conclusion

Economic development and demographic situation in Ukraine and Russia from year 2000 to 2008 were analyzed. Influence of bad health of the population on the economy, extremely high mortality, and possible solutions on demographic tendencies' improvements were discussed.

Firstly, it was found out that economic performance of Ukraine and Russia is rather positive. From 2000 Russia's GDP was growing at 5% to 9% annually, as long as Ukraine's GDP growth reached even 12.1% growth, with an average growth of 7% per annum. Inflation in these countries was quite volatized, but on average was in the range of 9-15%. Unemployment in Ukraine and Russia was continuously decreasing since 2000, and reached only 6.5-6.8% in 2008. Even though world economic crises of 2008 influenced negatively the economic indicators of the countries, by year 2010 they are slowly returning to their pre-crisis levels.

Secondly, demographic situation of these countries was discussed. Unfortunately, demography of Ukraine and Russia is much less optimistic, than its economic development in this period. Compare to other European countries, Ukrainians and Russians not only die younger, but also live less years in a healthy condition. For instance, average life expectancy in Russia was only about 66 years, and in Ukraine 68 years during the analyzed period. This low life expectancy, high mortality rates and low fertility rates resulted in the crucial consequences: Russia's population decreased by 5%, or 6.7 mln people, since 1993 to 2009, and Ukraine's population size dropped by 11.6%, or 6 mln people, during the same period of time.

However, as one may expect, the problem is not only in a shortened duration of life. More important is that the health status of the people is in a very poor condition. People have serious diseases that stipulate high morbidity, and therefore, less effective production. The macroeconomic evidence across the world confirms that countries with weaker conditions of health and education have a much harder time achieving sustained growth than countries with better conditions (WHO, 2001). In healthier economies, individuals live much longer on average and their lifetime economic earning is therefore higher (CMH Report, 2000).

The 'Commission on Macroeconomic and Health' (CMH) report (WHO 2001), draws evidence from across the globe, and demonstrates significant linkages of health with economic growth, and health and poverty. CMH strongly recommends undertaking country and regional level analyses and charting out national and regional plans of action.

Finally, after running our regression model, in which human capital was a proxy with life expectancy, gave no statistical dependence with GDP, most probably because of the fact, that the analyzed period was too short, or because of much faster increase in GDP than any changes in life expectancy can occur.

The best explanation for such results is that during economic transition there are more important factors that explain economic growth, like implementing new technologies, structural changes of the economy and shifting to more efficient production. Moreover, as to Russia, main reason for such a significant increase of GDP was an increase of oil and gas price. Being dominant in supplying oil and gas to Europe and post-soviet countries, Russian economy had reached enormous rates of GDP growth, up to 9 percent per annum.

Moreover, our economic analysis suggests that for Ukraine and Russia it seems inefficient in a short run to invest in health care to prevent premature mortality (only about 1 percent of GDP loss due to premature mortality). People die about their retirement age, so it is advantageous for a state to pay fewer pensions and do not spend significant amount of money on the health care. However, it is efficient in a long run, as the population's health is getting worse – a morbidity increase – which causes significant absence of work, huge state's allowances for medical treatment and maintaining those people, and decreasing of productivity of labor force. Besides that, poor health care treatment leads to premature mortality, decrease of a size of working population, which by turn decreases the advantages of grater labor input into production.

Another fact about demography conditions is that number of underage and old age population decreases proportionally; but working age population share declines in more rapid pace. Therefore, having this tendency, by year 2050 share of working age population will be only 60% compare to 64% in year 2006. This will lead to higher pressure on working age population in terms of taxes, and to lower quantity of labor force that can potentially produce more output.

All developed countries face serious problems connected with consequences of reproduction type change and age structure transformations (Pirozhkov, 2006). However, in Ukraine and Russia they are especially impressive. The highest mortality rate in Europe (15-16 death per 1000 population), and the lowest population growth (-5-6 people per 1000, compare to European level of zero or about +0.5), that actually is a depopulation case for Ukraine and Russia.

About half of deaths before the age of 75 in Ukraine could be avoided through adequate prevention and treatment, says new World Bank study (Working Paper 51829). The report shows that 94 percent of mortality caused by three major risk factors: tobacco smoking, alcohol consumption and breach of road safety could have been avoided with adequate prevention. Moreover, 25 percent of premature deaths in Ukraine in 2004 could have been avoided with effective health care treatment.

Thus, premature mortality could be avoided through behavior change and adequate prevention and treatment, and states have to implement new policies in order to save those people.

It is clear that the topic of this thesis is rather broad, and that further analysis is needed. Further research may contain more detailed cost-benefit analysis of morbidity and premature mortality caused by specific factors. Also value of statistical life (VSL) and willingness to pay (WTP) for mortality reduction can be calculated by stated preferences studies, the results of which can be used for more precise policy valuations.

Nonetheless, results of this study may contribute to better understanding of demographic situation in Russia and Ukraine within the European context and will allow using the experience of each of these countries in elaboration of social policies.

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Appendix 1

Table A.1: Gross Domestic Product of Ukraine and Russia, 2000-2008, US Dollars

	Ukraine		Russia	
	GDP, bln $	GDP per capita, $	GDP, bln $	GDP per capita, $
2000	31,3	635,7	259,7	1775,1
2001	38,0	780,7	306,6	2100,7
2002	42,4	879,5	345,5	2377,6
2003	50,1	1048,5	431,5	2984,0
2004	64,9	1367,4	591,7	4113,6
2005	86,1	1828,7	764,5	5340,8
2006	107,8	2303,0	991,5	6957,5
2007	142,3	3068,6	1294,9	9112,8
2008	180,4	3898,9	1679,5	11831,5

Source: World Bank, 2010

Table A.2: Population of Ukraine and Russia, 1990-2009, mln people

	Ukraine		Russia	
	Million people	**Decrease compare to 1993, %**	**Million people**	**Decrease compare to 1993, %**
1990	51,8		147,7	
1991	51,9		148,3	
1992	52		148,5	
1993	**52,2**	0,00	**148,6**	0,00
1994	52,1	-0,19	148,4	-0,13
1995	51,7	-0,96	148,5	-0,07
1996	51,2	-1,92	148,3	-0,20
1997	50,8	-2,68	148	-0,40
1998	50,37	-3,51	147,8	-0,54
1999	49,9	-4,41	147,5	-0,74
2000	49,4	-5,36	146,9	-1,14
2001	48,9	-6,32	146,3	-1,55
2002	48,5	-7,09	145,6	-2,02
2003	48	-8,05	145	-2,42
2004	47,6	-8,81	144,2	-2,96
2005	47,2	-9,58	143,5	-3,43
2006	46,9	-10,15	142,8	-3,90
2007	46,64	-10,65	142,2	-4,31
2008	46,37	-11,17	142	-4,44
2009	**46,14**	-11,61	**141,9**	-4,51

Source: World Bank, 2010

Table A.3.1: Russia Vital Statistics, per 1000 of population, 2000-2008

	Number of Births, persons	Number of Deaths, persons	Natural increase/decrease	Birth Rate	Mortality Rate	Rate of natural increase/ decrease(-)
2000	1266,8	2225,3	-958,5	8,7	15,3	-6,6
2001	1311,6	2254,9	-943,3	9	15,6	-6,6
2002	1397	2332,3	-935,3	9,7	16,2	-6,5
2003	1477,3	2365,8	-888,5	10,2	**16,4**	-6,2
2004	1502,5	2295,4	-792,9	10,4	**16**	-5,6
2005	1457,4	2303,9	-846,5	10,2	**16,1**	-5,9
2006	1479,6	2166,7	-687,1	10,4	**15,2**	-4,8
2007	1610,1	2080,4	-470,3	11,3	14,6	-3,3
2008	1713,9	2075,9	-362	12,1	14,6	-2,5

Source: Russian Federal State Statistics Service, 2010

Table A.3.2: Ukraine Vital Statistics, per 1000 of population, 2000-2009

	Number of Births, persons	Number of Deaths, persons	Natural increase/decrease	Birth Rate	Mortality Rate	Rate of natural increase/ decrease(-)
2000	369807	744128	-374321	7,8	15,3	-7,5
2001	376479	745953	-369474	8	15,6	-7,1
2002	390687	754911	-364224	8,1	15,7	-7,6
2003	408591	765408	-356817	8,5	16	-7,5
2004	427259	761263	-334004	9	16	-7
2005	426085	781964	-355879	9	**16,6**	**-7,6**
2006	460368	758093	-297725	9,8	**16,2**	**-6,4**
2007	472657	762877	-290220	10,2	**16,4**	**-6,2**
2008	510588	754462	-243874	11	**16,3**	**-5,3**
2009	512526	706740	-194214	11,1	15,3	-4,2

Source: State Statistics Committee of Ukraine, 2010

Table A.3.1: Russia and Ukraine Statistics for Econometrics Model, 2000-2008

		GDP, billion $	Labor, million people	Inv/GDP, %	Life_exp, years
Russia	2000	195,91	80,03446	15,34743	65,34
	2001	259,71	80,76926	18,29425	65,23
	2002	306,6	81,53613	17,58459	64,95
	2003	345,71	80,93088	18,80575	64,85
	2004	431,49	80,83174	19,7411	65,27
	2005	591,74	81,49696	19,49911	65,3
	2006	746,53	82,02592	20,58946	66,6
	2007	990,58	83,8527	23,60284	67,51
	2008	1290,08	83,65084	25,13158	67,88
Ukraine	2000	31,26	26,59345	10,27837	69,91
	2001	38,01	26,47917	11,5026	68,33
	2002	42,39	26,36262	10,72905	68,32
	2003	50,13	26,16492	12,42054	68,24
	2004	64,88	26,05777	11,65348	68,22
	2005	86,14	26,35292	12,58446	67,96
	2006	107,75	26,24541	13,87899	68,1
	2007	142,72	26,15525	15,4334	68,25
	2008	180,36	26,09199	17,3281	68,27