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Introduction and Rationale

Demographic change is a global phenomenon of the 21st century, which will not disappear and it is affecting both the developed and the developing world with growing speed.

This inevitable change does not pertain to just simply the size of a given nation, but it also concerns a new equilibrium among generations. On a country level, this new equilibrium implies unprecedented challenges regarding its social structures, economy, wealth, health, and, finally, political governance. In addition, this change might also affect the quality of relations between single nations and regions with some countries gaining influence while others will become less influential and powerful. In other words, we are also referring to stability and potential future conflicts.

The coming decades will, therefore, confront us with changes for which history has not equipped us to manage. This is why this matter is so daunting and makes it all the more crucial to be permanently prepared for change and open to innovation and creativity. However, this will only be achievable if enough knowledge and the necessary education and training are developed in the time remaining.

At least since the 1980s, demographers have been drawing attention to the dramatic fall in birth rates in developed countries and the consequences thereof. Nevertheless, the public has been slow in reacting to such information and it was only recently that European citizens became aware of the massive scale of the problem before them. What, after all, are the implications for a country such as Switzerland, if the total figure for its birth rate (the number of children per woman) is scarcely more than 1.4 and it should actually be 2.1 in order to keep the population constant without immigration and, at the same time, life expectancy is constantly rising and surpassing any forecast? This scenario results in one truly challenging question:

"What would it be like, if in 2050, one single economically active person will be almost the only source of support for one pensioner?"

As demographic change occurs very slowly, it is necessary to examine it, not only during the next few years, but also in the decades to come. This change will not become truly dramatic for another 15 to 20 years. However, from 2030 onwards it will occur in a so far unprecedented way. This will be the time when today's dominant and economically active cohorts, the 'baby boomers', will be permanently retired.

To meet this challenge, our urgent responsibility – today and not only today – is to prepare and educate future leaders appropriately. We must already now initiate soundly based skills to enable today's students and tomorrow's leaders to successfully master the challenges which economies and societies will face in the next 15 to 20 years.

The three critical components of the scenario awaiting alternative solutions are:

1. Below replacement birth rates.
2. Shrinking working-age populations.
3. Dramatically growing cohorts of retirees.

In the autumn semester of 2009, the Master Program of the University of St. Gallen (HSG) offered as part of its so-called "Context & Reflection Program" a special class entitled "Megatrend Global Demographic Change – Tackling Business and Society Challenges in 2030 and beyond."

The participants of this class formed nine working groups and were engaged in finding creative solutions based on solid academic analysis for one of the following project themes under the umbrella subject of "global demographic change":

1. Global demographic change: Develop a scenario of shrinking and growing regions/states.
2. 2030-2050: Compared to the US, the workforce in Europe will shrink and conventional thinking translates population decline into economic contraction. Develop recommendations as to how this weakness can be overcome.
3. Europe 2030-2050: Conduct an analysis of services/industries, which will gain attractiveness and those, which will lose attractiveness.
4. Switzerland 2030-2050: Prepare a scenario of the population size and composition.

5. Switzerland 2030-2050: Is the inevitable demographic evolution homogeneous across the country or not? What is the potential impact on the economic evolution and potential new industries?
6. Today's youth and not the "baby boomers" will be hit by the potentially harmful consequences of demographic change. Conduct a creative approach as to how citizens aged between 20 and 30 years in two nations of your choice envisage how they will manage this challenge.
7. Prepare a submission to the Walder Stiftung Award "Leben und Wohnen im Alter" ("Life and living in old age") by developing a business concept as to how elderly Swiss citizens could live in an innovative and stimulating environment.
8. Prepare a submission to the Walder Stiftung Award "Leben und Wohnen im Alter" ("Life and living in old age") by developing a business concept as to how elderly Swiss citizens could live in an innovative and stimulating environment.
9. The recently published Careum study on demand and supply for healthcare services in Switzerland forecasted a shortage of 200,000 healthcare professionals by 2030. You are in charge of tackling this challenge!

In the following chapters you will find the corresponding papers, which were submitted by the working groups. After reading these papers, you will be inspired by many aspects of the students work and agree that these young students have developed an initial understanding about the business environment in which they are most likely to live between 2030 and 2050 and as such, today they are already sensitized to develop and hopefully execute new business models – business models, addressing the challenging demands of the societies which will exist during this twenty-year period.

Dr. med. Hans Groth, MBA

Guest lecturer on: "Demography and its interconnection to wealth and health."

November 2009

Universität St.Gallen

Hochschule für Wirtschafts-, Rechts- und Sozialwissenschaften

(HSG)

Megatrend “Global Demographic Change”: Tackling Business and Society Challenges in 2030 and beyond

Topic 1

Global demographic change: Develop a scenario of shrinking and growing regions/states.

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Megatrend “Global Demographic Change”

Dr. Hans Groth

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1. Introduction

Fertility rates are declining, life expectancy is rising and as a result the world's population is ageing. This chain of causation is not a modern invention, but was already predicted in 1929 by Warren Thompson in his concept of demographic transition. Over these last 80 years, the world's population has indeed been ageing, bringing along an increase in population and an end to this process is not yet foreseeable. Much rather, it is expected, that the world's population will have reached 8.3 billion by the year 2030 (United Nations, 2008). Immediately, the question arises as to what the main consequences of this development might be for the world as a whole and its inhabitants in particular.

It is at this instant that the following paper finds its starting point. Starting from an analysis of regional population prospects for the year 2030, the authors then speculate what the consequences for the regions might be. By covering a variety of aspects, such as economics, social structures and others, the major goal is to find the winners and losers of this demographic transition. In the last section, the authors will take a critical view on their results. Benefiting from one of the author's experience in system dynamics, we will try to summarize our results, uncovering further influencing factors that have not been considered at the beginning.

But let us start now with the basis for the whole discussion – the population prospects for the world in the year 2030. These figures were taken from the database of the United Nations population division, which is based on the analysis of future trends in fertility, mortality and international migration. Since we are talking about the future, all these figures have to be treated with caution, meaning that the actual future population might differ from these figures.

1.1. Future Population prospects

An increasing population has been a global phenomenon since recent decades. Chart 1 illustrates how the world's population has increased from 1950 (2.5 billion) to 2010 (7 billion). Further growth is expected with the population reaching 9 billion in just 40 years time.

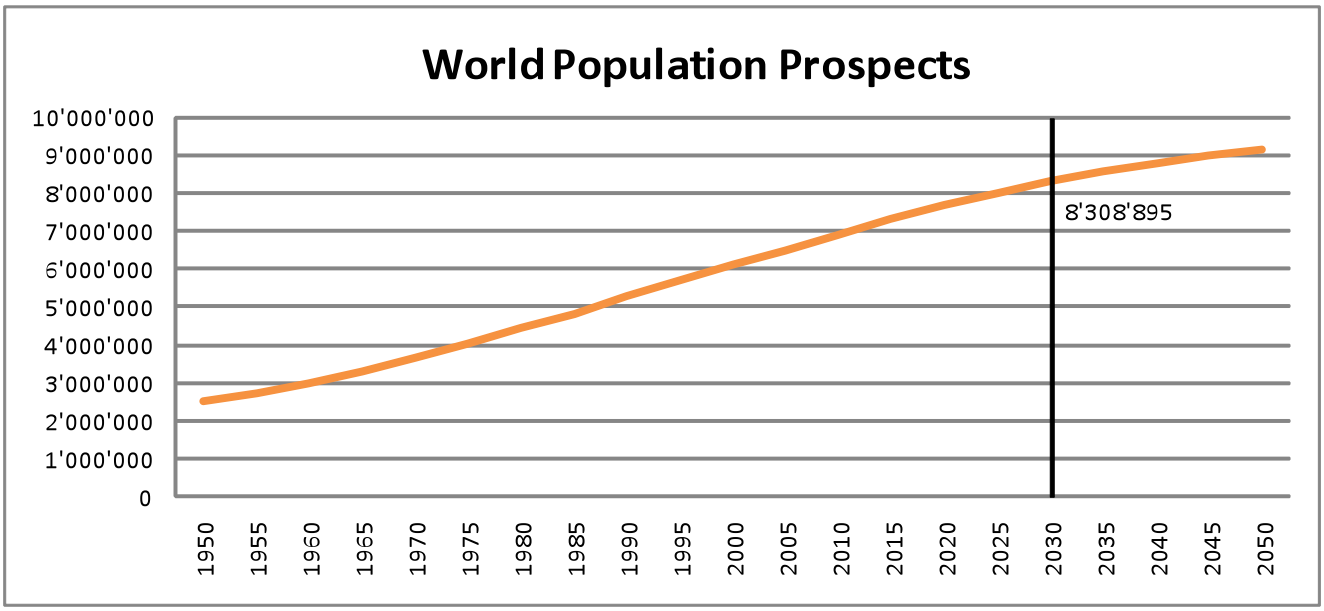

Chart 1: Development of World Population (1950 to 2050). Source: UN Database

Now that we know, how the world population will develop in the future, let us consider regional developments, so that we have a statistical basis for our upcoming speculations. The division of the world into different regions has been executed according to our main literary source for the upcoming pages on country profiles[1].

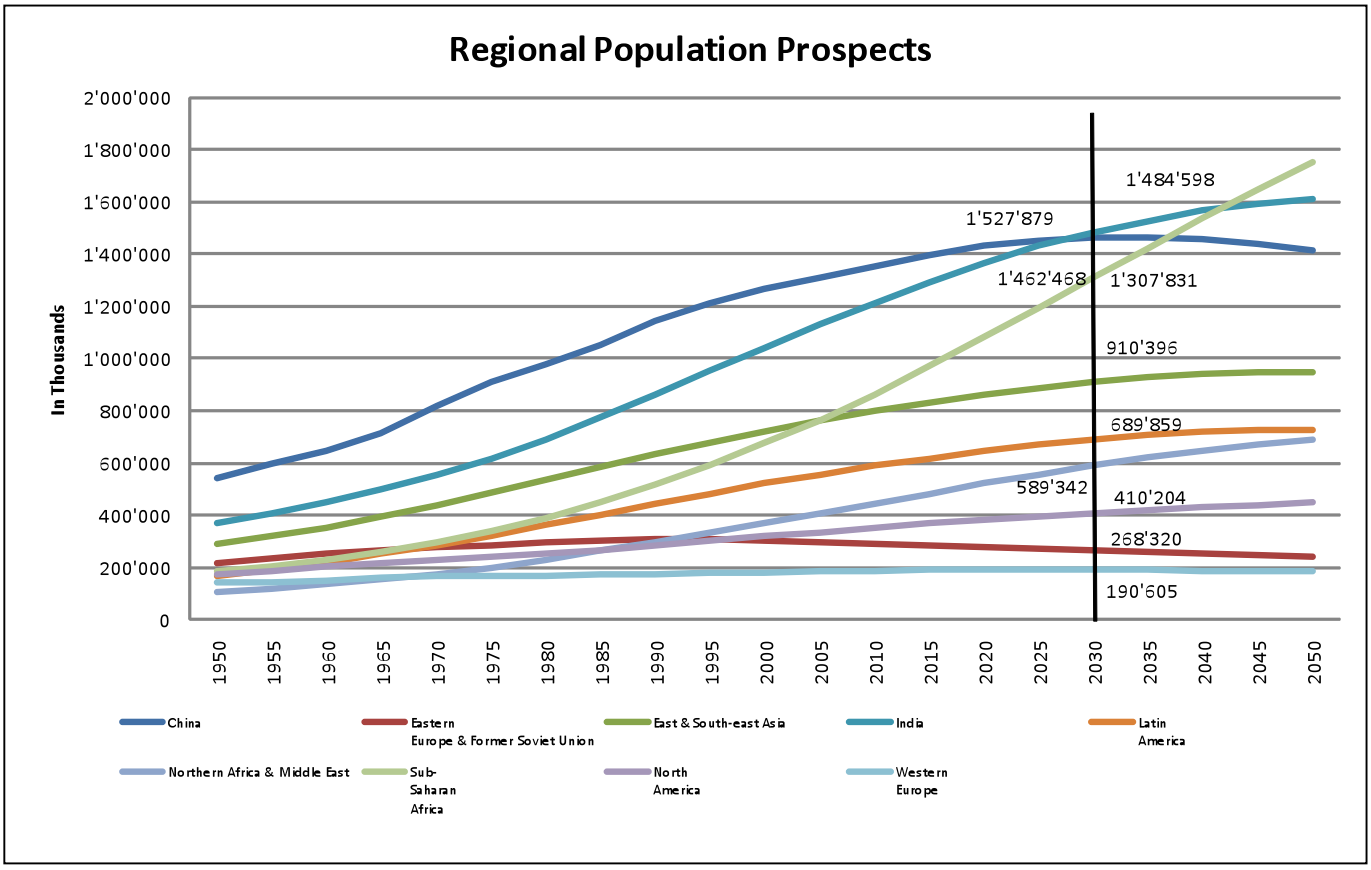

Chart 2: Development of population (1950 to 2050) for major regions of the world. Source: UN Database

As can be seen from Chart 2, the overall trend of a growing population will continue in most of the regions covered. The populations of China and India continue to grow and will each have reached around 1.45 billion people by 2030. By that time, India will have surpassed China as the most populated country. Furthermore, we experience an immense increase in the population of Sub-Saharan countries, which will join China and India at the top of the list. In just 20 years their population will have grown by approximately 40% from 900 Million to 1.25 Billion. Contrary to the other two countries' populations, the slope of the graph for Sub-Saharan Africa does not seem to stagnate. We can therefore imply from this that in the far future, Sub-Saharan Africa will be home to the largest community of the world's population. The graphs of North- and Latin America, the Middle East and South-East Asia seem to move in parallel to the formerly described, but at a much lower level.

When looking at Europe, we see a totally different trend. The population of Western Europe will remain stagnant over time, while that of Eastern Europe and the former Soviet Union will even start to decrease. Overall we can conclude that the population growth gets smaller, the more industrialized the region becomes (W. Lutz, W. Sanderson & S. Scherbov, 1997).

[1] Gobbicchi, A. (2007). *The world in 2030: Regional Trends.* Rome: Military Centre for Strategic Studies.

2. Future country/region profiles

Now that we have reached an understanding of how the population will develop in the coming decades, it is our goal to evaluate what the implications of these developments might be. Special interest is thereby given to possible future economic-, political- and wealth distribution among the regions. The primary objective is to develop a picture of how the future world order might appear. Regarding the following passages, the authors tried to mainly express their own opinion, nonetheless some literary backing had to be included, giving guidance on which factors will be most crucial for the future of the regions.

2.1. North Africa and Middle East

The population in this region will grow at a considerable rate and reach about 600 Million by 2030. The region can be divided into two distinct groups of countries. On the one side, there are oil-exporting countries that have already reached high-level incomes (ex. Kuwait, Qatar, etc.) and on the other are the less developed countries such as Afghanistan or Yemen.

The *high-income countries* will, in our opinion, not experience a lot of growth in their population, but they will profit from the worldwide trend, as the demand for energy, namely oil, will increase. Due to their financial power it seems likely, that these countries will further strengthen their status as centres for economic activity and become one of the major trading partners for European and American economies (OECD, 2009a). Education will be high among citizens, resulting from the almost unlimited financial possibilities. The Western immigration of specialists will continue at a high level while the community of Arab people will more or less remain constant. The immigrants bring along their Western lifestyle, but probably not socio-cultural values or even democracy. We believe that Islam will remain the source of cultural values and that the countries will distinguish themselves from the West through them. As a consequence, it seems unlikely that democracy will find room for development. Much rather, the current governance framework of a constitutional monarchy dominated by royal families will remain. These families will have to spend a fair amount of effort to manage social pressures that will emerge from the overall inequality between their privileged position and that of the large common work force (A. Gobbicchi, 2007, p.14). In international politics, we expect the countries level of influence to increase, arising from the dependence of the world on their oil reserves and as a result of their economic power. Major concerns will be stability in the region, with a special focus on the developments in crisis prone areas such as Iran and Afghanistan, as well as the fostering of their ties to the West.

In *less-developed countries* we expect most of the population growth in the region to take place. These countries, like the rich ones depend heavily on oil revenues, but have to cope with much larger population and developmental problems. Other industries in the region are often strictly regulated and cannot compete on even grounds with their international competition (A. Gobbicchi, 2007, p.9). Other factors disrupting the economic growth in the region are, in our opinion, to be found in the instability of the government and the often high corruption rate among the federal institutions. As a result, we expect that the region's economy will not be able to cope with the increasing availability of workers. Unemployment rates will increase, bringing along a demand for improved social structures. Since governments in these countries are very unstable, we cannot expect a comprehensive social reform to take place. We assume, that immigration to the West will increase, as people look for work and social stability. In return, we think, that the West will start restricting immigration to protect its own economy, society and culture. As a result, these poor Arab countries might then turn to their rich neighbours in search of help (A. Gobbicchi, 2007, p. 11-13). The rich Arab countries will probably fulfil this role, as it

gives them the possibility to create a certain amount of stability in the region, stemming from the dependency of the poor countries. Overall we do not expect the poor Arab countries to become important in international economics and politics.

2.2. Sub-Saharan Africa

The population in Sub-Saharan Africa is expected to skyrocket in the coming decades, increasing by almost 40% to 1.25 Billion people. Most of this increase can be attributed to the extremely high fertility rates (4-5 children per woman) among the poor, mostly rural population (OECD, 2008, p. 70). About 60% of the region's labor force is engaged in agriculture, which is often the only possibility to nourish a family (E. Harsch, 2004, p13). Children of small-scale farmers are therefore seen as workers, contributing to the well being of the family. Due to climate change and water shortage, successful agriculture in Sub-Saharan Africa will, with a high possibility, become very difficult. We therefore expect hunger to become an even more serious problem in the region, which the local governments will not be able to tackle on their own. Dependence on Western aid programs and support will further increase.

Other sectors of the economy will experience big difficulties in developing to a considerable size. Inappropriate infrastructures, high illiteracy rates and political instability are not a favourable framework for economic growth. Economic power and wealth will continue to range among the lowest levels worldwide.

As exceptions to these general developments, resource-rich countries will be the main economic drivers in the region (A. Gobbicchi, 2007, p. 26). Especially, the worldwide increase in energy needs will bring revenue to oil-rich countries such as Chad, Nigeria or Angola. But also other resources, such as gold and diamonds will find demand in the rest of the world. Whether this will increase the countries' economic power and wealth depends heavily on how meaningful the new income will be spent (R. Nji, 2006, P.17).

Governments in Sub-Saharan Africa will be confronted with a diversity of problems arising from population growth. The already mentioned high rates of malnourished people are not likely to drop in the future, nor can we expect, that their weak economies can handle the additional work force available. Since these countries lack social safety nets and adequate health systems, we expect the already high crime rate to further increase as people become more desperate. Low levels of education will remain and further foster HIV rates (A. Gobbicchi, 2007, p. 21-23). In our opinion, the most democratic governments in the region will not be able to lay focus on these internal problems, but rather have to engage in the preservation of their power. Especially non-institutionalised political groups, such as guerrilla- and rebel movements, consisting of people that feel let down by the governments, are likely to challenge current leaders. The likelihood of Civil Wars and open confrontations will increase as the social problems become more severe, troubling the civil population even further.

As a consequence of this instability in the region, Sub-Saharan countries are not likely to actively engage in international politics, except for the weapons trade. Western countries on the other hand will increasingly engage in aid programmes, bringing food and medication to the troubled population. We also expect the West to start new, more long-term oriented programmes to help governments establish social services and promote the diversification of the economy. The main motivation for these programs lies, in our opinion, in an attempt to reduce the immigration of Africans across the Mediterranean Sea. The political power of Sub-Saharan countries will be almost non-existent on an international scale, with the exception of South Africa. We believe that South Africa, being the only Sub-Saharan country with a stable democratic government, will serve as the main contact for Western countries to the region.

2.3. Eastern Europe and the former Soviet Union

The population development in the region of Eastern Europe and former countries of the Soviet Union is moving in an opposite direction than that of the overall trend. In the future, the population in the region is expected to recede, arriving in 2030 with about 260 Million, a level similar to that found in 1960. The major sources of this trend seem to be the declining fertility rates in combination with a reduction in the life expectancy (United Nations, 2009, p.7). Studies show, that most of this population trend can be attributed to Russia, where mortality rates are higher than ever (N. Eberstadt & A. Shah, 2009). We will therefore look at Russia separately from the rest of Eastern Europe.

The economies in *Eastern Europe* have been growing consistently ever since the fall of the Soviet Union and the move to capitalism. This development is only to be prolonged, if the countries succeed in managing the effects of population changes. The ageing of the population in combination with emigration trends of young people to the EU will bring along shortages in labor supply. Furthermore, it will be important for countries in the region to reduce their dependence on Russia and to actively contribute in international trade for their economies to grow (A. Gobbicchi, 2007, p. 32-34). For all these reasons we expect several Eastern European countries to apply for membership to the EU. With the support of the members of the EU we are certain, that the countries can overcome these challenges and experience further growth in economic power. Trade will increase in the region, bringing wealth and prosperity to the population.

After the fall of the iron curtain, democracy emerged as the new dictum. But the transition to the new state of mind did not advance at the same speed. Especially the new members of the EU show strong democratic tendencies accompanied with well functioning health and equality programs. Most other republics of the former Soviet Union are experiencing more problems in the transition. "Post-communist countries can claim both the worst as well as the best record in transition from authoritarianism to democracy." (A. Gobbicchi, 2007, p. 37). As we are expecting more countries in the region to apply for membership to the EU, we believe, that these countries will experience similar developments towards a stable democratic system. Governments will be eager to reform the system and put all their effort into it, while maybe neglecting the international scale of politics somewhat. However, being a member of the EU, not only brings advantages. Of course, the countries in the collective now have more power in international politics with the backing of the EU, but among the member states the former Soviet Union states will only have a limited say. Particularly, since they are more dependent on the EU and its members for trade and aid, than the other way round.

Overall, it is our belief that economic power, wealth and social stability will increase in the former Soviet republics if they join the EU, but on the other hand they will remain dependent on the EU and therefore lose individual political power on an international scale.

Russia, as one of the world's leading economies is facing a grave depopulation problem. The population is expected to decrease by almost 20% from the current figure of 100 Million to just about 80 Million people. Ever since the fall of the Soviet Union mortality rates have been unusually high. This is mostly attributable to Russia's high prevalence of HIV, cardiovascular diseases as well as poisoning due to excessive drinking (N. Eberstadt & A. Shah, 2009). Above all, death rates among males aged between 20 and 65 years are alarmingly high, meaning that the overall work force will be shrinking. The Russian economy will not be able to grow and pensions will not be paid anymore. On the other hand the demand for energy will increase as the world population grows, bringing more revenue to the resource rich country. Our projections for the Russian economy are therefore ambiguous, but in general, we expect the economic power of Russia to decrease, as manpower gets lost. The government in turn will

have to react to these dynamics and create new health reforms; they will have to invest heavily into the nations industry if it wants to remain among the great powers. Furthermore, we expect Russia to further open itself to the world and especially to the West, as EU member states are coming closer to the Russian borders and membership in international institutions becomes more relevant. We are sure, that Russia will lose some of its current status but remain very important to the world due to its size and resources.

2.4. China

China's population will have reached its peak in the year 2030 at around 1.45 billion people. By that time, China's one-child-per-family policy will have fully developed its potential, since the population would be much higher in the absence of this policy. The ageing of Chinese people is assumed to continue, increasing their share of overall population to almost 23.5% for people over 60 years of age by the year 2030 (United Nations, 2008).

These changes in population bring important challenges to the Chinese economy. Due to the increase in population, the economy needs to provide a huge amount of job opportunities for the new entrants into the labor market. The best job opportunities can be seen in the service sector, which employs only a small amount of the work force in comparison to other industrialized countries (A. Gobbicchi, 2007, p.44). As a result of the ageing process of the Chinese population, the work force will get older as well. Companies will have to be prepared for these changes, providing job opportunities and pension plans suitable to these new circumstances. Agriculture in China will be heavily influenced by climate change. Cyclonic rainfalls and long-lasting heat waves are expected to reduce the efficiency of current regions, demanding regional spreading of the sector (OECD, 2008, p.486). The biggest part of China's enterprises is still state-ruled, limiting foreign investments and therefore preventing them from rapid growth. In recent years however, a tendency towards the privatisation of companies has been observed (A. Gobbicchi, 2007, p.44). We expect this trend to further extend, meaning that Chinese companies will grow not only in size but also in efficiency, as foreign investments provide room for new possibilities. Therefore, these companies will demand labor, providing some of the urgently needed job opportunities. Overall, China's economy is assumed to be growing further, making it the biggest economic power in the world (W. Maddison, 2005, p.34).

China's Government will be faced by huge challenges in the future as the percentage of people working to people in retirement decreases heavily. The country's pension obligations will climb, while the population contributing to it decreases over time. We therefore expect the Chinese Government to raise the age of retirement as well as the contribution amount of the working individual. The additional costs for health care can only be covered, if the economy keeps up its pace of economic growth. Together with the shift from the agricultural sector to the service sector, people will move to the cities. Projections estimate, that by 2030 almost 60% of China's population will be living in cities, demanding additional living space and huge amounts of investments by the government in infrastructure and planning (A. Gobbicchi, 2007, p.42). Other challenges for the Chinese government will be the increasing inequality between the poor rural and the rich urban population, as well as environmental problems caused by the rapid growth of energy-consuming industries.

On an international scale, we expect to see an increase in the cooperation of Chinese and Western governments. Especially when discussing international trade and foreign investments China's economy will need investments to grow and new markets to sell their products. As a consequence, dependence will increase on both sides, demanding that all parties adjust themselves to common international standards. As one example, we assume that China will soon have to commit itself to the human rights

set by the United Nations in exchange for Western help in modernizing and privatising the economy. China's future interaction with minorities, namely Tibetans or Uigurs will affect its relationships with the rest of the world. At some point in time China will also have to admit that its vast consumption of energy has a negative effect on the environment and agriculture in particular. The scenarios created by current studies predict that in 10 years time, 200 Million people in China will be hit by water restrictions, producing heavy falls in crops and forcing the government to import huge quantities of grain (A. Gobbicchi, 2007, p.49). China is under a lot of pressure, if it wants to successfully manage its future, making its economy and government reliant on the West and therefore forcing it to change its current course of politics.

2.5. India

In the year 2030 India's population will be up at a level similar to that of China (1.45 Billion). Growth is mostly attributable to an increase in life expectancy (70 years) as well as a receding, but in comparison to other regions, still high fertility rate (2 children per woman) (United Nations, 2008).

India's economy has been one of the fastest growing economies in the world since the last 30 years. Most of the increase can be attributed to the service industry, in particular IT, which in 2006 accounted for almost 50 billion Dollars in revenue (OECD, 2007, p.22). Unfortunately, the growing industry will only offer job opportunities for a selected number of these new entrants, since these jobs require a certain level of education, which only the rich, urban people can afford. For the large part of rural, less educated people, agriculture remains the main sector for employment. But agriculture itself is, in our opinion, not expected to grow, since it is heavily reliant on the monsoon, the rain period. Due to climate change, India already experiences water shortages and falls in crops, resulting in only small growth rates for the agricultural sector. The most promising sector for economic growth and uneducated employment will therefore be manufacturing. However this sector is ruled by heavy restrictions from the government, limiting its growth and reducing its potential (A. Gobbicchi, 2007, p.55).

In our opinion, the Indian government will soon have to remove these restrictions, if it wants to actively tackle its social challenges. Through the removal of these regulations, the government will be able to counteract several problems. First, it will actively reduce unemployment, second, it can foster economic growth and diversify its economy and third, it will reduce the inequality between rural and urban people, and reduce poverty and hunger. Tensions between the rich and the poor have amplified in the past, as the socio-economic distance between them has increased. These tensions can even be found in the government, as all the different religions and ethnicities are taking part in parliament (A. Gobbicchi, 2007, p.61). Considering the different backgrounds and motivations for political engagement, it becomes obvious, that India is facing the danger of political fragmentation. The creation of coalition governments will continue in the future and might hamper the economic development of the country through its instability. Another important sector where action has to be taken is climate change. India's economic growth came at a high price. Air pollution is currently among the worst in the world and is not expected to get any better, as the manufacturing sector is expected to grow. Monsoon rainfall will decline further, reducing the efficiency of agriculture and requiring the government to import grains. Water pollution has made it difficult for the rural population to find fresh and clean drinking water.
India's rapid growth in population as well as economic power has created a huge demand for energy. Therefore India is going to be heavily dependent on the foreign supply of coal and oil for their energy needs, making it vulnerable to foreign interests and demands. As we expect the Indian government to remove the restrictions on its industrial sector, other economies of the world will be more than willing to establish trade relationships. We assume, that India will become more active in international politics to be able to support its growing economy with the resources it needs. Accompanied by sectoral

growth, we also expect poverty to be further reduced, extending the middle-class and national demand for goods, pushing imports as well as local sales up. Through the privatization of the industry sector, government resources will be made available for the creation of social reforms and health plans for the poor, rural population.

Overall, we see India as one of the major economic and political powers of the future. It is definitely the region most benefiting from the overall demographic change.

2.6. East and South-East Asia

East and South-East Asia will form a significant part of the world community in 2030. The region's population will by then have grown to almost 900 Million (United Nations, 2008).

The future of this region is affected among other factors by climate change. Coastal agriculture, infrastructure and resources exploration and exploitation, as for example oil, are at risk due to a rise of sea levels. In addition, increases in the frequency and intensity of extreme weather phenomena will affect the countries of this region and especially low income rural populations. Countries such as Bangladesh with 300km of coastline will be most vulnerable to the rise in sea level because about 10% of its soil is situated within 3 meters above sea level (A. Gobbicchi, 2007, p.63).

In East and South-East Asia a significant number of countries depend on glaciers for their fresh water supplies. These countries will face the stress of melting glaciers affecting the water supply and hence agricultural production. According to IPCC (2007, p.480), agricultural production of cereal in South Asia will decrease between 4% to 10% in the next three decades.

Climate change is also very likely to cause an increase in infectious diseases like malaria and schistostomiasis. This will affect the workforce population, cause societal problems and increase the need for funds in order to support health services.

Increasing world temperatures and less rainfall will result in reduced precipitation and increased evaporation. This will decrease biodiversity in Australia and New Zealand and will also negatively affect stockbreeding and agriculture (A. Gobbicchi, 2007, p.63).

From an economic point of view, we can divide the region in to high - and low income countries. The *high income countries* are Australia, Hong Kong, Japan, Korea, New Zealand, Singapore and Taiwan. Amid these, Japan is among the richest fuelled by a solid economy. It faces a population ageing issue as at present about 20% of its population is over 65 years old, resulting in an increased need for medical and pension paying expenses (United Nations, 2008). Japan also faces strong inequalities. Currently, 30% of its workforce is employed part-time, earning only 40% of what full-time employees do (OECD, 2009b). In addition, Japan should be more integrated into the world economy. The import penetration is 15% of its national GDP and foreign employees constitute only 1% of its workforce (OECD, 2009c). This fact minimises the high skilled workforce as the country is not open to granting work permits. Japan's economy is also not open to M&A and thus a significant proportion of the domestic companies cannot take advantage of foreign equity and know-how. Australia and New Zealand constitute more open societies and have strong economies and relatively low debt. The government's economic policies apply structural reforms in an effort to ensure macroeconomic stability by easing market rules, improving competitiveness, maintaining a healthy inflation rate and reducing unemployment (A. Gobbicchi, 2007, p.64). Moreover, these countries will have to cope with an ageing population increasing health expenditures and overcoming fresh water supply shortages which affect their agricultural production.

The other rich South Asian economies have a lower GDP and income per capita, but greater potential for growth by adopting new technologies. They also have a well educated and highly skilled workforce, strong institutions and wide-spread internet access. Their economic achievements are impressive, showing considerable GDP growth between 1990 and 2005 for Taiwan, Singapore and Korea. This group of countries also faces the problem of an ageing population. In general, these economies rely heavily on external manufacturers and suppliers for their rapid growth, capital and know-how. The countries should be transformed to high technology and service oriented economies in order to sustain their sustainability and growth. Taiwan and Korea, for example, face significant shortages in high skilled employees and are trying to solve this problem by initiating programs to attract highly skilled personnel and increasing spending on education (A. Gobbicchi, 2007, p.64).

The second group of *low-income countries* in East and South East Asia are the developing countries. These countries vary heavily in income levels and population numbers. It is noteworthy that a large number of their population is of a young age. Their economic systems have achieved major economic growth in the last decade. Poverty has declined, but unstable situations created by, for example, terrorism and internal conflicts hinder them from achieving even higher economic growth (A. Gobbicchi, 2007, p.66).

2.7. Latin America

The population in Latin America is expected to grow only by a comparably small percentage to around 700 Million by the year 2030. The major factors for this limited growth are the heavily decreasing fertility rate and high emigration prospects (United Nations, 2008).

The region's economy, despite having problems, has proven to be succesful with a reported annual average growth of 5% (United Nations, 2005, p.32). In addition, the region reported large exports especially to NAFTA. In general, these countries performed well except for some poor regions in Mexico and Brasil. The global integration of Latin American trade, which was supported by groupings such as the Andean Pact, reported limited success. Deep political problems and corruption limit the economic achievements and, despite efforts to create a Latin American economy, most countries remain as individual actors. Two concerns cloud the economic picture of Latin America. Its successes are limited to certain geographical territories and its economic achievements are constrained by limited employment. Overall, Latin America wil remain a relatively minor player in the global economy and this is likely to continue in the years to come (A. Gobbicchi, 2007, p.74). Its regional GDP is about 6% of the world's and most of it results from the exploitation of natural resources rather than from enterpreneurial activities or efficient reorganisation of the economy (United Nations, 2005, p. 32).

Latin America's social conditions have not changed substantially. The region demonstrates high inequalities among the population and the distribution of wealth is assymetrical. This economic characteristic extends to severe social impacts as these are relatively poor societies. Poverty forces a significant percentage of the population to work for longer hours and households to depend more and more on non-monetary transactions in order to cover their needs. These tendencies have led to the development of a parallel economy. Social and economic inequalities in the region become an even more complex issue when considering racial hierarchies. Whites dominate the social and economic life leaving ethnical minorites in a lesser position. This situation also leads to an intensive wave of emigration mainly towards the US and the EU. Groups emigrating unfortunately also consist of young, well-educated people, that see no future in their native countries.

From a political point of view, most of the countries have succeeded in supporting free expression of preferences and have institutionalised elections, an important step to democracy. But still, in some countries as, for example, in Cuba and Haiti, the viability of their political and economical entities can be doubted (A. Gobbicchi, 2007, p.75).

In Latin America we observe a political movement away from traditional institutions. The absence of the state from important aspects of everyday life makes it difficult to provide services that win legitimacy and public support. This in turn increases the attractiveness of social movements and agglomerations, which weaken the authority of the state and create a vicious cycle. Tensions between the countries of the region, for example between Chile and Bolivia, reduce the prospects of becoming a safe region, attractive to foreign investment. Furthermore, the dependency on the US for exports weakens the economy as well as the governments. The regions prospects until 2030 vary. Its growth has not kept up with the rest of the world since a long time. Combined with inequality and internal problems, this means that the relative weight of its markets has declined. In addition, the US is unlikely to invest heavily into their economies, as it fears threats to its supremacy in the region. Also, if the US decides to drastically limit the number of immigrants from NAFTA, poverty and inequalitites will increase even further.

Regarding water supplies, the region holds 42% of the world's fresh water supplies and 1/3 of the world's annual rainfall (A. Gobbicchi, 2007, p.79). This will make the region an important fresh water supplier for the next 25-30 years. Another issue regarding Latin America is the increasing regionalisation. Despite all the efforts to unite the countries at least economically, this trend reflects the breakdown of the central authority. The breakdown may even lead to the creation of 'grey zones' of contested authorities in the years to come, affecting economic transactions and sustainability.

2.8. North America

The population in North America is believed to increase from 350 Million (2010) up to 410 Million (2030). Since fertility rates and life expectancy are only marginally changing from current levels, we conclude, that most of the increase will come from immigration (United Nation, 2008).

North America is characterised by an open trading system, light regulatory requirements and a competitive corporate culture. These characteristics cause a significant annual growth and low unemployment in relation to EU countries. The USA has the most unequal distribution of income and a weaker social safety net than other industrialised countries. There are three major issues that have to be resolved in the next 25 years: the health care system, the pension system and the balance in tax revenues (A. Gobbicchi, 2007, p.83).

The critical question is, whether these reforms can be developed without disturbing social peace, the market for labor or commercial decisions of firms. This will be mainly influenced by demography as more than 20% of the population will be over 65 years old in 2030 (United Nations, 2008). Health care spending will increase and the pension systems will come under a lot of pressure. The diminishing labor force could also reduce the growth of potential output. Immigration could be a possible solution for the problem for both the low skilled and highly skilled labor forces, and for this reason the current deadlocks regarding immigration are likely to be overcome in the following years. While there are efforts to achieve a solid macroeconomic policy, the drop in the value of dollar will cause foreign investors to lose confidence in maintaining their assets in the US currency. The government is depending on foreign savings to finance the deficit. This dependence is not without risk. The long-term fiscal policy entails even more difficulties than the problems arising from population ageing. Due to these new policies, military spending will come under a lot of social pressure as demands for

government resources increase. This will probably ignite a rise in taxation and deteriorate domestic services.

Canada has a small size and its fate seems to be closely related to its southern neighbor. According to Deutsche Bank (2005), Canada's GDP per capita growth will be only slightly lower than that of the US in 2020. In contrary to the US, this country achieved productive immigration policies, making it a less unequal society and less plagued by urban crime. Its education levels are very high and the military demands are lower. Its productivity levels per employee are lower than in the USA, but its fiscal policy is almost in balance.

In the US again, the inequality in income and wealth has increased in the last 10 years and this trend is likely to continue. And as income inequalities rise, so does the political polarization. It seems that there is a direct relation between income and voting preferences[2], and foreign policy in the US clearly reflects this domestic political polarization. Events like the ones in Iraq might cause mistrust between the United States and other nations. Regarding the political and economic concequences of immigration, it is noteworthy to mention that about 12% of the USA population are immigrants and that this percentage is expected to grow in the future (OECD, 2009d). The largest proportion of these immigrants comes from Latin America. As immigration commences, it will become more controversial to clarify who is a minority and which groups can be classified as disadvantaged. In addition, competition among race based coalitions might extend into the political views of the US population and therefore influence foreign policies. The status of the US foreign policy is more at question than ever before. Events such as those in Iraq and Iran, as well as long term engagements global security, may not be bearable anymore. It is evident that the USA will have to rely more on negotiation and bargaining skills as well as elements of 'soft power', like diplomacy and constructive engagement with third parties. There are four issues worth mentioning. First, the US economic pre-eminence will remain a constant in the international economic system until the middle of this century. Second, it will have a healthy demographic profile thanks to young professionals immigrating to the country. Third, the US will continue to be dominant in military and technological research, giving it a significant advantage over other regions. Fourth, the US is the centre for cultural trends and open to new influences. These developments will create an environment suitable for the development of new ideas and concepts. Overall, these factors provide a basis for the US to remain in its significant position in the world of the foresseable future (A. Gobbicchi, 2007, p.87ff).

2.9. Western Europe

Western Europe's population is expected to stagnate over the upcoming 20 years at a level of about 190 Million. Similar to North America, fertility rates are low and life expectancy high. If it would not be for immigration, the population in Western Europe would probably be declining (United Nations, 2008).

With its $12 trillion dollar regional GDP, Europe is the world's largest economic block. In comparison to other regions, the EU is a good place to live. The life expectancy is 79 years, the rate of infant deaths is low and at the same time income and wealth are more equally distributed than in the US. Despite these obvious advantages, the EU demonstrates a smaller growth rate, higher unemployment and 1/3 less productivity per capita than the US. In addition, the EU's position in the global economy will be minimised over the next decades, due to high tax rates, bureaucracy and social politics that limit the dynamism of its economy. The cost of these policies is likely to increase in the future and the possible answer to this will be improvements in productivity. In addition, the EU is characterised by inflexible labor markets, demanding a better balance between job security and job flexibility. Employment

[2] High income households are by a majority voting for Republicans, while low income households mainly vote for Democrats

protectionism reduces employment opportunities for some groups, like women and youth and lengthens unemployment periods (A. Gobbicchi, 2007, p.91).

A better global and European integration is also expected to take place. Reducing agricultural subsidies, supporting progress in WTO negotiations and accepting free trade could ease budgetary pressures, reducing unemployment and raising output. In addition, reducing barriers to services trade would further boost productivity gains from a single market. In terms of imports especially from growing economies, such as China and India, it is difficult to predict the implications, because the rise of income in the these countries will in turn also increase the demand for European products. Europe needs to demonstrate more flexibility in economic arrangements and innovation. The high administrative requirements impede the creation of new businesses and there is a need to integrate bureaucracy in one language in order to avoid transaction costs and inefficiencies. Expenditures in research have to be increased, managed more efficiently and be output-oriented.

Regarding demographics, currently 17% of Europe's population is over 65 years old. By the year 2030, 2.4 productive individuals will have to support an elderly one (United Nations, 2008). This will require measures to improve productivity. Population ageing will also reduce savings, lower demand for goods and increase expenditures in health care. In order to address these issues and prepare for future problems, pension contributions will probably increase up to 40% of the wage (A. Gobbicchi, 2007, p.93). Continued immigration is expected to have a positive impact on the economy, although the social dimensions prove to be more problematic. While immigration can prove good for the economy, the long staying immigrants are not integrated sufficiently into European society. From the aspect of debt sustainability, aging has implications for the sustainability of public finances. In order to sustain a strong Euro, the Growth and Stability Pact is designed to limit fiscal expansion by regulations for the deficit not to exceed 3% of the GDP. But this limit is already far exceeded by a number of countries (European Comission for Economic & Financial affairs, 2005, p.6).

The EU is a unique institutional arrangement, integrating the states of Europe and it will have to overcome three fundamental challenges. First, it will have to define the borders where it really ends. Second, it must resolve the imbalance between economic integration and social Europe. Third, it will finally have to be represented by a centralised government and bring its citizens together. If the EU wants to assert a role as a 'normative power' like the US, Russia and the emerging powers of China and India, there are three fundamental issues to be addressed. First, the conceptual framework and treaties, on which the EU is based do not fully cover the needs of the new complexity that the 27 members impose. These frameworks need to be further deepened and adjusted. Second, the EU still has to prove that it can craft a cooperative foreign policy that integrates national defence capacities and establishes regional welfare standards. Unless it does this, the unequal distribution of social risks will undermine the social integration of Europe. Third, the EU will have to improve its demographic deficit with a more solid structure. Failing to do so, "Euroscepticism" will grow and a lack of confidence will undermine its legitimacy. During the last few years, a new rationale for European integration has been emerging: the global role and emergence of Europe. The EU is speaking with one voice only in terms of global trade. Furthermore, we witness conflicts within the EU. The gaps between regions within the union are still considerably high and in order to address them action is required to go beyond social gratifications and economic promises in order to generate trust and common action. At the moment, the EU has to decide on whether globalization is an opportunity or a threat and how to deal with the challenges emerging from it (A. Gobbicchi, 2007, p.95ff).

3. Winners & Losers

According to the above-mentioned measurable data, it seems that the world situation in 2030 will be characterised by changes, regarding economic flows, political influence and power. The world of tomorrow seems to be complex in a way like never before, however, intelligence and leadership will still manage to confront the forthcoming challenges.

China will face a serious over-age problem in the following years, which could be compensated by its rapidly growing economy, that is if its centrally guided administration does not lead to monolithic economical approaches. It faces inequalities in economic and social areas among the general population. Despite the economic growth, in the future it will still require a market to consume its products and good investment opportunities for its surplus – at the moment the biggest investor for China's surplus is the US bond market.

India has a large and increasing population and it seems to be a technology driven economy. Its economy is growing but still faces economic and social inequalities among the general population. These internal problems seem to be a drawback to its status, but the economic power of this country will continue to rise. India, like China, will play an increasingly bigger role in international economics and affairs.

North Africa and the Middle East will play a role, similar to that of today. The Middle East will continue to supply the world with oil and gas, but its role will be more integrated, as it is investing in new technologies and education. North Africa will still be a developing region dependent on the West. Sub-Saharan Africa currently faces overpopulation combined with malnourishment, internal problems and no infrastructure. These are very severe problems and will prove to be a very serious drawback to its development in years to come. This region will be in about the same situation as today, i.e. still in need of help from the West.

Eastern Europe faces a decreasing population and its fate is related to a successful application to join the EU. This region has the will to develop, but its position in 2030 will most probably be that of a follower to the EU, still requiring assistance regarding growth. Russia also faces depopulation, but still has vast land and natural resources at its disposal. This region still retains a good army and is likely to play a role similar to its current one in the future, if it can successfully face its severe internal problems.

In East and South East Asia, high income countries will continue to play a significant role in the international economy. Still, the low-income countries will have to face their internal problems and will continue to be a location of choice for mass production by larger economies and MNCs.
Latin America has presented some economic success, but its results are highly localised. The economy is more dependent on natural resources and less on enterpreneurism. The social inequalities, political movements and tensions in the area lessen the economic gains. When this is combined with the obstacles often imposed by the US, these gains seem to be restricted. Latin America will continue in the future to play a significant role in the global economy, but with a restricted international voice and unimportant economic strength.

Western Europe has adopted a mixture of free trade policies and socialism. Europeans seem to be relatively open minded regarding the economy, well educated and with less social problems than the rest of the world. The GDP of the EU is the largest in the world and Western Europe will continue to play a very important role in the global economy and politics.

North America has adopted free trade and an open economy. The USA is the largest innovation engine ever invented. Citizens seem to be open minded, educated and despite problems, society seems to be stable. Its financing capabilities heavily depend on the bond market which increases its dependency on other economies. Overall, this region will continue to play a leading role in the global economy and international policy.

4. Critical assessment of results

In this essay, we created a scenario of growing and shrinking regions and used our findings in order to speculate which of these will gain in political and economic power, as well as, wealth in the following years up to 2030. We examined factors that are directly relevant to economic expansion, such as economic policies and demographics, which are quantifiable.

From an economic point of view, our world might be described as a systemically dynamic, autoevolving, and highly selective system[3]. Systemically dynamic, because it is a dynamic system of high complexity. Autoevolving, because it has the ability to change and adapt, and selective, because the adopted non viable solutions will develop entropy and cause the system to self destruct. Based on this perspective, there appear to be more factors relevant to understanding differences between the regions. These factors are not measureable and include issues such as mentality and culture.

It appears that Western and particularly Anglosaxon regions have a different perspective of how the world functions. This initially means more enterpreneurial spirit, less reluctancy in initiating and adopting change and a more efficient organization of the economy. To briefly explain - these societies seem to have adopted a way of thinking that enables them to be more willing to take risks and to be more successful in commercially applying their ideas. The US for example, has proven itself to be the best and most efficient innovation engine in the world. In addition, its history has demonstrated that its conception of economy drives them towards open systems like trade, expansion, the adoption of new ideas and new ways of thinking. Even their language (meaning English) has adapted to a more simplified form in an effort to ease business interactions. In addition, even the organisation of the economic system is more efficient, meaning that protectionism is absent most of the time. There appears to be a mechanism at work that minimizes the effects of entropy and fosters rapid changes towards the necessary corrective actions. An approach to visualize such a system can be found in Shape 1 of the Appendix.

In contrast, non-western societies seem to just copy and follow what has been generated in the West. Knowledge is a very dynamic, rather than static concept and it needs to be constantly perfected and developed in order to be sustained. If no new concepts and no new ideas enter a system then this system will deterministically develop entropy and it will self destruct. A visual representation of such a system is Shape 2 of the Appendix.

In comparison, it becomes evident that non-western societies tend to perfect already existing concepts, rather than create new ones. Also, their educational system seems to be solid in many cases, but still not as capable of generating innovative ideas as those of the West. We have to keep in mind, that globalisation created additional dynamics in the world of economic and societal interactions. Consider for example the land of ‘Chimerica’ as it is called in the economic language. This land is not a country or

[3] Definition by Dionysios Anastasopoulos

a region, but it is characterized by the interactions between China and the USA. Simply describing this system, Western companies invest in China and offer know-how, which is the basis for innovative ideas. China on the other hand becomes an economic power, but still relies on the Western markets to absorb its products and to invest its surplus; the system is not able to redevelop itself. Our world is now characterised by such interdependent cooperations, not only locally but also internationally, meaning that systems capable of adapting seem to be more promising for the future.

All of the above-mentioned factors and interactions between systems constitute a complex environment from which we can conclude that not only demographics are the main defining factors. Rather, it is also a matter of non directly measurable factors, such as politics, know-how and technology, established institutions, such as the use of the Dollar as the global reserve currency, decisiveness, boldness and ways of thinking that will determine the allocation of wealth and power in the world of tomorrow.

5. Conclusion

The world in the foreseeable future seems to be relatively faster than today, with the now developing countries having a significant advantage in relation to their current role in international affairs and the economy.

China and India seem to be in a much better position in 20 years from now, due to their immense economic development, but they will not be without their internal problems. Western Europe and North America are likely to continue playing a dominant role in global international affairs and the economy. Latin America will play an increasingly more important role, but regional characteristics like localisation and internal problems will lower its economic and political power as well as its influence. The Middle East will continue providing the world with energy and will enjoy a similar position as it does today. Africa will continue having internal issues and a lack of infrastructure, while Eastern Europe will become more dependent on the EU than on Russia. Russia will face depopulation, but still its resources and army will allow it to keep an important position in international politics and the economy.

These conclusions are mainly based on past and current data, which enable us to estimate some forecasts. Yet, as proven in the past, forecasting cannot always be accurate, especially for such small periods of time as 20 years; conflicts, the dynamism of innovation, leadership and system dynamics might cause forecasts to differ from projected reality. Nonetheless, demographics and economic developments enable us to at least describe the major characteristics of a future world order.

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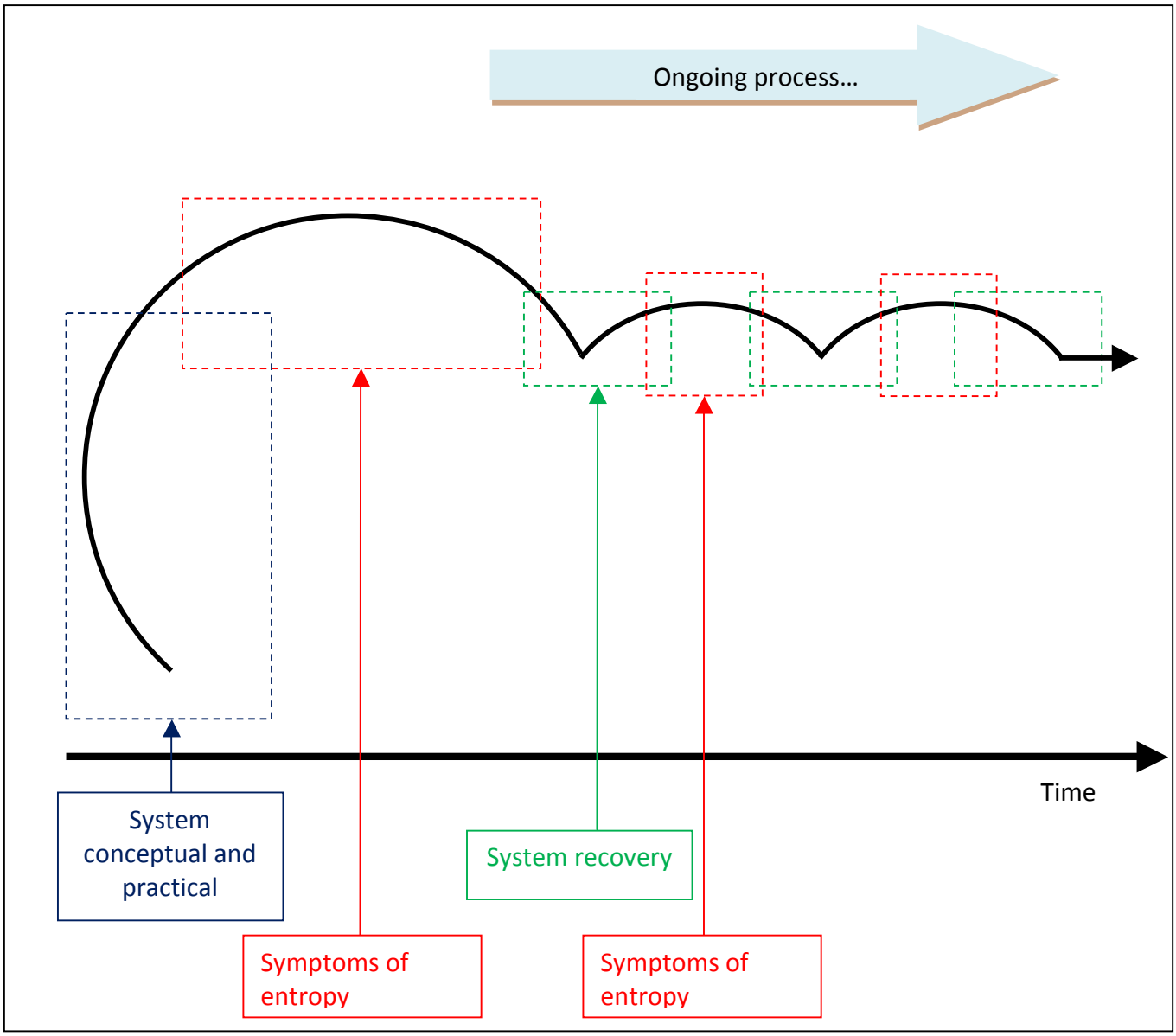
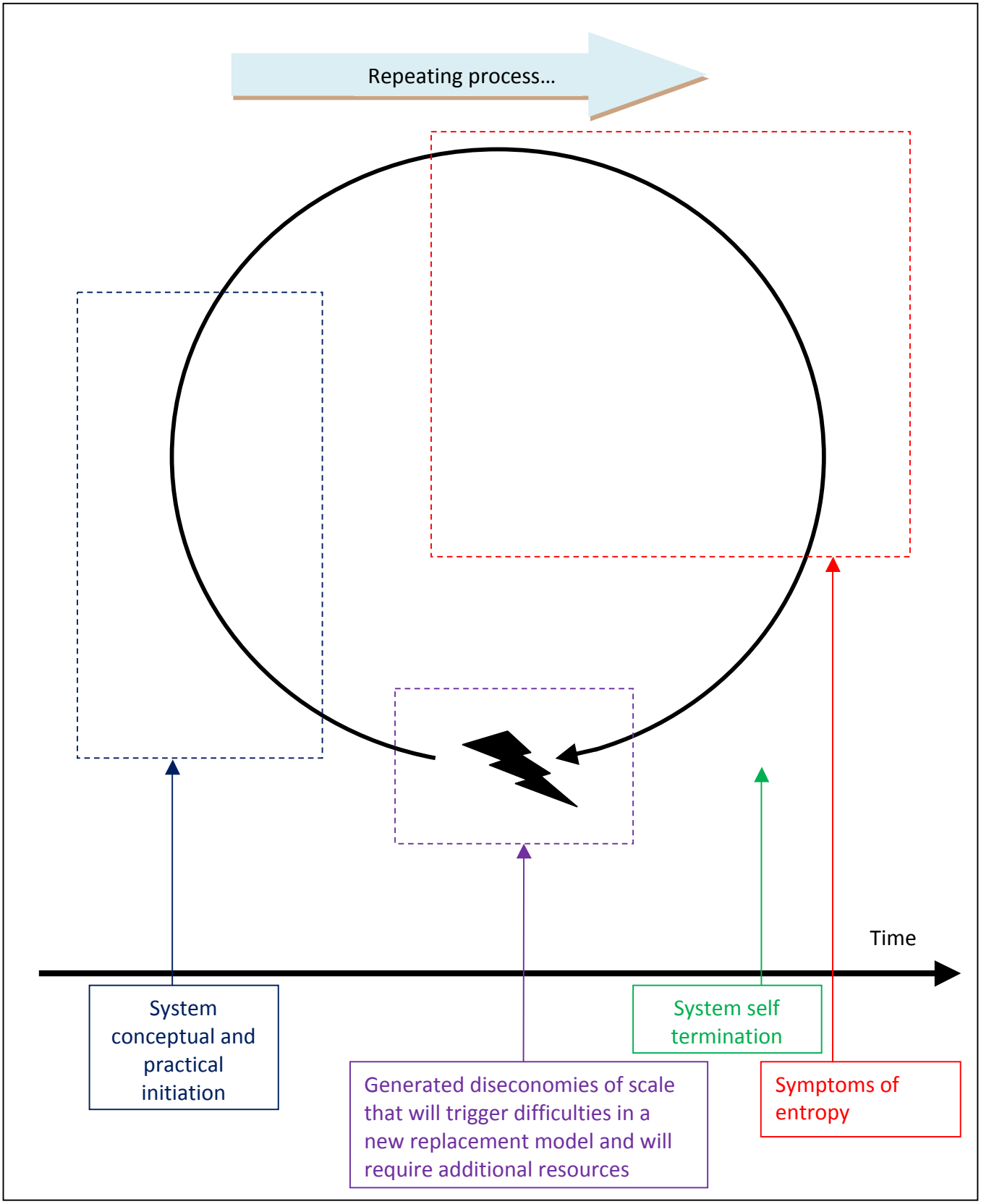
8. Annex



Shape 1: Simplistic approach of an open complex system, avoiding entropy through reorganisation, change & a
Source: Self-developed concept and schematics



Shape 2: Simplistic approach of a closed complex system, creating entropy, which leads to self-destruction.
Source: Self-developed concept and schematics

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Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 2

2030-2050: Compared to the US, the workforce in Europe will shrink and conventional thinking translates population decline into economic contraction. Develop recommendations as to how this weakness can be overcome.

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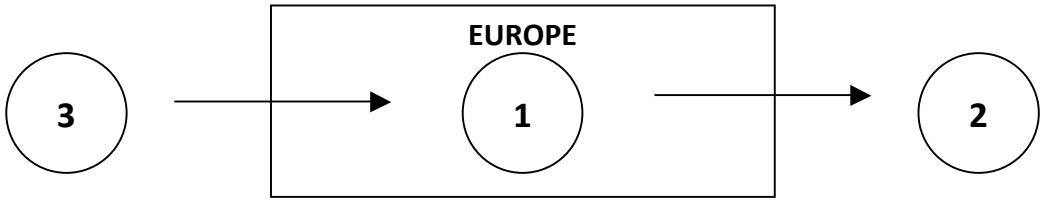
Table of Contents

I) Background

1) Objective and structure of this paper

The topic of this assignment is to examine the situation of the European workforce between 2030 and 2050 in the framework of shrinking populations and the subsequent economic consequences. Based on that assessment, recommendations are developed on how the evolving problems ideally should be coped with.

There are basically three levers that can be worked with when trying to tackle demographic change, which is depicted in the following schematic figure:



First, when it comes to the local people, it is important to develop systems that are on the one hand able to foster the reproductive capacity of Europe, but are on the other hand also able to deal with the increasing number of elderly citizens. Second, there have to be policies in place, which ensure that valuable talent is kept inside of Europe by providing a high living standard and favorable tax regulations. Third, as European countries will be net mortality societies, it will be crucial to bring foreign talent into Europe.

After the presentation of facts and projections on the shrinking workforce in Europe in general, this paper is organized according to three levers: First the economic impacts are presented, second the various policy options will be presented, and third there is a focus on specific proposals. Afterwards a conclusion will be drawn.

2) Facts and projections

As explicitly mentioned in the assignment, Europe will be in a very different situation than the United States by 2030 or 2050. First we will examine the dynamics of the population. While the European population declines by 6,6% until 2050, the U.S. American population grows by 42,9%[1]. If one takes a closer look at the age distribution, another significant

[1] see Figure 1 in appendix

difference between the two regions becomes evident: the Americans certainly also have a big increase in elderly citizens, but compared to Europe they are still generating young citizens. In Europe, there is a decline in all age groups between 0-59 years, while in the U.S. all age groups are growing[2]. Especially the age group of 40-49 year olds, which is said to be most productive, is declining by 25-28% (compared to +14-28%) (Prskawetz, 2007, p.7).

From now on, this paper will focus on the region of Europe. The population development has a severe impact on the 'old age dependency ratio' in Europe, which is defined as the number of pensioners above 65 years divided by the number of workforce members aged 15-64. In the aggregated view of the EU-27 one can see that while in 2005 an average of four workers cared for one pensioner, it can be assumed that by 2050 less than two workers have to ensure a pensioner's living expenses.[3] It is remarkable that this holds true for all European countries: there are no evident differences between Western and Eastern Europe.

It has been empirically proven that economic growth is correlated to the age structure of a population (Prskawetz, 2007, p.5). Consequently, one central question arises: How can the offspring of the baby-boomers generate the wealth necessary to care for their parents, while also assuring Europe's competitive position in a global economy? Therefore, it is crucial to develop a sense of urgency in order to work out a plan of action on how Europe can equip itself for its endangered future.

3) Relevant trends in Europe

Trends in fertility

The most commonly used indicator for fertility is the Total Fertility Rate (TFR). It gives the average number of children per woman, assuming that all women are going to give birth according to age specific fertility rates observed for a given period. Currently, all EU Member States have TFR levels below 2.1, which is the level needed for the replacement of generations, but a distinction is made between countries with a dangerously low fertility rate of below 1.6 and countries with a comfortably low fertility rate of 1.6 to 1.9. The latter countries can still expect to offset their natural population decline with a reasonable level of immigration (Eurostat, 2008).

[2] see Figure 2 in appendix
[3] see Figure 3 for the aggregated view and figures 4 to 6 for country details in appendix

Trends in life expectancy and wealth

The overall life expectancy in rich countries has risen tremendously and shows no sign of slowing down. Christensen et al. (2009) state that if this trend continues every second child born in Western Europe today will reach 100 years of age. Furthermore, as mortality rates are usually an indicator for health and economic productiveness, Eberstadt & Groth (2007, p.60) have developed the hypothesis that 'health equals wealth'.

The authors even consider the health of the Europeans compared to their U.S. American counterparts to be an untapped potential, which might help in solving the problems triggered by demographic change (p.55).

Trends in retirement ages

In recent years, the retirement age has been stable while the life expectancy is increasing. Eberstadt & Groth (2007, p.65) assess that "…between 1970 and 2004 the time of retirement has almost doubled in some European countries". That implicates that pensioners are dependent on the social systems much longer than assumed when "generation contracts" were established.

Trends in immigration

In the second half of the 20th century, large parts of Europe witnessed a historical change from emigration to immigration. For the year 2005, the United Nations has estimated that there are about 40 million migrants in the EU-27 Member States. The flows for Italy and Spain, which accounted for almost two thirds of the total, were heavily impacted by decisions to regularize illegal migrants. If immigration were to remain at this high level, then the EU's working age population would continue to grow until around 2030, rather than already starting to decline in 2011 (European Commission, 2007).

II) Lever 1: Strengthening the young local workforce

1) Economic impact

The large cohorts that were born between 1945 and 1965 form a bulge in the population that is gradually working its way through the overall age structure. At present the 'baby boom cohorts' are still part of the working age population. After 2010, the positive effect this cohort has on European productivity is expected to turn negative (Prskawetz, 2007)[4].

Although international migration may play a crucial role in solving future labour market shortages, its impact on population aging is likely to be small. For example, to keep the age structure in Germany unchanged, over 3 million migrants per year would have to be admitted. But Bomsdorf and Babel have conducted an interesting sensitivity analysis for Germany, in which they found that changes in the fertility rate have a relatively greater impact than net migration has for the population.

We can therefore not only expect that the mere quantitative lack of workers will have a severe impact on the European economy, but as mentioned in the introduction, it will also be highly critical that the most productive parts of the workforce diminish significantly.

2) Policy options

Increasing fertility

A return to higher fertility rates would not prevent the accelerated aging resulting from the baby boom cohorts growing old as a time lag of about 20 years must be taken into account before results become visible, but fertility has to be fostered in a long-term perspective.

The choice to have children is very personal, and the way a democratic government can influence it, is by removing obstacles that prevent those that would like to have children from actually having them. According to the 2006 Eurobarometer, women would actually like to have more children, but do not feel that the right infrastructure is in place.

The obstacles that Europeans face are a lack of jobs and housing, difficulty in reconciling paid work with family life and perhaps also a lack of confidence in the future. Greater gender

[4] see figure 7 in the appendix

equality and a better work/life balance seem to be suitable for increasing both the female labour force participation and the fertility rate. In fact, countries where many women are in paid employment - often supported by effective instruments to reconcile work with private and family responsibilities for both men and women - tend to have higher fertility rates than countries where fewer women work.

Some European countries have already found some successful public family policy mixes:

a. Financial support (including tax breaks) is paid in order to reduce the financial inequality between people with and without children. According to the 2006 Eurobarometer, young couples are exposed to the risk of poverty when contemplating having children. In addition, the proportion of students who are parents is very low. The exception is Sweden with 41%, because a range of social and economic measures is available for student parents.
b. The presence of children combined with an absence of services to take care of them has a clear impact on the employment situation for women. The employment rate of women caring for young children is lower than that of women without children.
c. Flexibility in working hours and work organization, such as flexi time systems or teleworking has a huge potential for making the parents' life easier.

<u>Raising employment rates</u>

Furthermore, it is important to raise employment rates by stimulating young people and disadvantaged groups such as the disabled, ethnic minorities and immigrants.

However, Europe has laws that make it hard to fire people and to hire new ones. Western Europe's remarkably low availability of work cannot only be explained as a consequence of prosperity, or 'special European tastes for leisure'. To the contrary, today's 'underworked European' is primarily a creation of the policy environment, e.g. expensive to hire and difficult to fire. Consequently, European employers tend to be exceptionally cautious about taking on new hires. Thus a rationalization of European labour markets that creates more flexibility is needed.

The potential for achieving this goal in Europe is within reach. If all European countries brought employment rates in general, but for women in particular, to the levels of the

current three best-performing countries, this would make an important contribution to solve the entire demographic challenge in Europe. Women have accounted for the greatest growth in employment in recent years, both in relative and absolute terms, with more than twice the growth than for men.

Increasing productivity

Once the population of working age has started to decline (by 2010 in EU) and no further improvements in employment rates can be expected (by 2017 in EU), Europe's economic growth will depend on raising productivity alone. This has to be boosted by structural reforms to allow the less productive countries to catch up with the more advanced countries. Even the productivity leaders in Europe can accelerate their growth by further raising general education levels, removing obstacles to innovation and structural change, boosting research and development efforts and more efficient production processes.

Labour productivity depends to a large extent on previous investment in human capital. One of the targets for this matter agreed on in the EU (in the framework of the Lisbon targets) is to reduce early school-leavers to below 10%, as they have poor employment prospects and a huge risk of being unemployed[5].

The development of new technologies and their transformation into new products and services and better production methods requires highly skilled graduates. Yet, the EU invests approximately 1.2% of GDP in tertiary education compared to nearly 2.9% in the US. A lack of top-level graduates may also limit the scope of raising the overall level of investment in research and development, which again can lead to brain drain with highly qualified researchers moving elsewhere. R&D spending in the EU averages below 2%, while in the US it is close to 2.7%, of GDP.

Regarding the focus on human capital, it is important to emphasize the content of the education. A good example in this regard is Finland, which invests significantly in education and primarily focuses on content. In addition, the importance of secondary education should not be neglected, since it has a considerable effect on recruitment for additional education at the tertiary level.

[5] see figure 9 in appendix.

3) Proposals

a. Promoting demographic renewal in Europe through greater gender equality, as Europeans would generally like to have more children and this should be stimulated.
b. Promoting employment in Europe: more jobs and longer working lives of better quality. The main potentials for increased employment rates lie in women and the elderly.
c. Promoting higher productivity: countries must invest more in human capital, reduce early school leavers and stimulate upper-secondary and university education. Also, the productivity-leaders can improve by boosting research and development to create new products and more efficient production processes.

III) Lever 2: Enhancing productivity and working time of the aging

1) Economic impact

If not managed well, the disproportion of workers to pensioners will have tremendous impacts on the public finance sector and the development of the entire economy. If social security systems fail to take care of its citizens, major social uproars have to be expected. Therefore, it is crucial to look at opportunities for enhancing the productivity of the aging, so that they can care for themselves for a longer period of time.

2) Policy options

Retirement policies

Many experts argue that the current retirement policy is unsustainable. As mentioned, the retirement age has been stable while the life expectancy is increasing. The expected average time in retirement is approaching 20 years (OECD, 2009). Consequently, the government has increasing pension and healthcare expenses and it seems obvious that we need to adjust the retirement policies to these trends.

Research clearly shows that the additional years in retirement are expected to be *healthy years* (Tesch-Römer, 2006), so it is merely a symptom of our prosperous lives that we automatically expect to use that time for leisure purposes. Several OECD countries have now started to reform, or are currently in the process of reforming their pension systems and are giving people strong incentives to remain in the labour market as long as possible. Many countries, for example Norway and Sweden, have extended the period of earnings history used for calculating the pension. This gives strong incentives for people to stay in the labour market, as their pension will be strongly influenced by the additional years at work. *"*The employment rates of older workers are projected to increase massively from 40% in 2004 for the EU-25 to 47% by 2010 and 59% in 2025. Older workers have accounted for *three-quarters* of all employment growth in the EU in recent years, and about half of the projected increase is due to the positive effects of recent pension reforms..." (European Commission, 2007, p.57).

Incentives for people to *gradually* reduce their participation in the labour market instead of exiting the market with a full stop at around 65 years are also important; this will have strong positive effects on the entire economy as production and human resources are used

more efficiently. As we see, the change and adjustment in retirement policy is already taking place.

Age discrimination

In most Western societies aging in general is conceived to be something negative. Firms primarily focus on younger employees, and when staff has to be laid off, it is often the older people that have to go. Elderly people are associated with not being as flexible, energetic, creative, productive and resilient as young people. However, as we will see in the following paragraph, this is often not true. One should instead learn to appreciate older employees' experience in the organization. For example, the European image of aging is in stark contrast to the Japanese one, where elderly people are highly respected.

The United Nations (UN, 2008) has put substantial effort into the topic, and in 2002 the UN implemented the so-called 'Madrid International Plan of Action on Ageing'. Thereby the UN member states committed "…to eliminating all forms of discrimination, including age discrimination". As a matter of fact, it is a *human right* not to be discriminated against, but it remains clear that age discrimination still takes place every day, and that there are major challenges ahead. However, the UN is working hard for a change in the societies' awareness, attitude and behaviour concerning all types of discrimination. There need to be clear governance structures to prevent it, and as we see, international measures are being taken.

Productivity

As stated in the previous section, productivity[6] in Europe has to increase and this chapter will have a special look at how the productivity of elderly workers can be fostered. Necessary preconditions for productivity at high age are first qualification and second health. As mentioned, the current generation of 50-65 year olds is as well educated and as healthy as never before – mainly driven by advances in modern medicine, healthcare, lifestyle and other socioeconomic factors that contribute to a long and healthy life.

In general, research shows *mixed* results about the relation of age and productiveness (Börsch-Supan et al, 2005). A common view is that productivity decreases with age due to a loss in physical and psychological capacities. However, this is not necessarily the case.

[6] productivity is here defined as GDP per hour worked

Normally research only shows a small correlation between age and productiveness. In fact, one study illustrates that the differences in productiveness of workers within the same age was greater than the average difference in productiveness between young and old employees. Further research showed that older workers often work somewhat slower, but with greater detail and quality than younger workers. Also, the older workers were showing less absenteeism. (Tesch-Römer, 2006, p.16)

The decline in physical and mental capacities seems to be delayed in line with the increased life expectancy. In that way, it seems that the two foundations for productiveness, being qualifications and health, are very much in place for the upcoming generations of pensioners, but there needs to be an increasing focus on the topic of life-long learning if we want to ensure that our elderly workforce is always updated about new techniques and processes.

3) Proposals

a) Delay the retirement age. One of the most important measures to increase productivity is to delay the current retirement age. Spending significantly more time in retirement than the previous generation takes away the prospect for next generations to live on social security.

b) Second, there is a need for fundamental change in policy towards the elderly. Age discrimination is still a big issue in today's society, and firms need to change the attitude against keeping older employees. As seen, the UN is already implementing measures to fight it, but the public's awareness on a national level has to be increased.

c) Productivity in the current and future labour force of the elderly has to be increased by a stronger focus on 1) life-long learning and education and 2) healthcare measures, both key drivers for growth in productiveness. As we have seen, healthy elderly who are well educated have a much higher employment rate[7], and thereby contribute to a healthier and more productive Europe.

[7] see figure 9 in appendix.

IV) Lever 3: Promoting smart immigration

1) Economic impact

Continued immigration will be needed to meet the requirements of the European labor market for both skilled and unskilled work. Expressed in numbers, about 56 million people will be necessary to compensate for the projected decrease in the working age population of the EU-27. Countries with higher fertility rates would likely not need to add much labor. Other states, such as Germany, Spain, Italy and Poland, will require large numbers of immigrants to replace the working population (European Commission, 2007).

As a strategy for dealing with the challenges of demographic change, countries may analyze immigration policy as a means for aiding the funding problems of social security systems through increased tax revenue and overall economic growth. Migration has economic causes and consequences, for which a country may observe associated benefits and costs. In a market economy, the additional output produced by new immigrants goes either to them in the form of wages or to the government in the form of taxes. But not all of the additional tax revenue is available to help finance the benefits of the existing aging. In increasing immigration, some of the tax revenue generated by these new workers is needed to finance the benefits that they consume, including healthcare, education and eventually retirement benefits. (Feldstein, 2006) In some cases, inflows of unskilled workers may reduce the wages of domestic unskilled labor. This contributes to rising wage inequality, selective unemployment and potential social costs. (Zimmerman, 2007) To the contrary, it has been suggested in literature that immigrants can raise productivity and real wages of native skilled workers. There is the possibility that skilled migrants may generate dynamic gains through increasing innovation. Such innovation could contribute to future productivity gains of native workers, resulting in a net increase in real wages. Immigration of skilled workers would be complementary to local skills, rather than substitutes for them. (Chellaraj et al, 2004)

Immigration generally raises the output of the economy, however, natives will suffer if their supply production inputs could be substituted by immigrants. Those whose production inputs are complementary to immigrants will likely benefit from raised productivity, innovation, and general economic growth (Zimmerman et al., 2007). It is evident that inflows of unskilled workers, which have been a rising share of U.S. immigrants in recent decades,

could reduce the wages of domestic unskilled labor and contribute to rising wage inequality (Clark, et al., 2002).

2) Challenges of increased immigration in the EU

Reducing the average age of the population and increasing the rate of population growth through immigration appears to be a logical solution to avoid increases in taxes or cuts in social benefits. However, while immigration can help to partly offset the decline in Europe's working population, it is not without its challenges. As employment opportunities are unevenly distributed across the EU, this presents a challenge to develop an immigration policy suited for each country's needs. Intra-EU mobility is still somewhat restricted in countries that have entered since 2004. Enabling and promoting intra-EU mobility could be a great source of increased employment rates for countries in which there is a need for labor.

Immigration involves consideration of not only economic effects, but also of social issues. Countries must fulfill current and future demands in the market. They must also recognize the importance of integrating migrants into the economy and society, promoting positive perceptions of immigrants to the native population, and respecting the immigrants' countries of origin. Additionally, the education levels of immigrants are traditionally lower than those of the receiving countries and therefore contribute little to innovation and technological advances (Feldstein, 2006). Social cohesion for immigrants is often difficult because of cultural or religious differences to Western Europe.

Religion has already proven to play a role in the integration of immigrants into European society. With about 15-17 million Muslims currently in Europe, this population has more than doubled in the last 30 years and will likely double again by 2015. This growth is partly due to a birth rate almost twice that of non-Muslim Europeans. Europe's Muslims are diverse and come from different countries with varied religious tendencies. France, Belgium, Germany and the U.K. have already experienced religious debates in the public sphere. France has, since 2004, banned the hijab veil in public schools, stating that it follows a longstanding law separating the state and religion. As the Muslim demographic grows in voting power, the foreign policy of Europe toward the Middle East will also likely be affected. Those countries, which have seen problems with Islamist extremism and increases in crime

levels, may also have unwelcoming attitudes towards immigrants. (Eberstadt & Groth, 2008) Issues such as this create a political barrier, making it difficult to accept more immigrants as a solution to Europe's demographic challenges. Nevertheless, the trend of a culturally diverse Europe should continue. The question of how liberal-minded and tolerant Europeans will be in protecting its values while protecting the rights of minorities in a joint society is not to be neglected.

3) Special case: Ireland

During the period 1999-2005, Ireland and Spain experienced growth in the labor market significantly above the EU average, which may be attributed in part to migration. Ireland is an interesting case as it had strong economic and employment growth, benefiting greatly from increased migration and particularly from the EU-10 (European Commission, 2007). In the ten years to 2003, Ireland experienced an economic boom and saw a large increase in highly educated, skilled workers with a notable increase in Muslim immigrants. Immigration plays a crucial role in the determination of wage and employment levels, and had a positive effect in the case of Ireland. According to Barrett et al. (2006), Ireland's increase in high-skilled labor increased GNP from 3.5 to 3.7 percent, attributing this to improved competitiveness and increased output. The reasons for Ireland's increased immigration are many, including improved economic conditions, ease of work permit attainment, asylum seekers and students. The economic impact of migration in Ireland remains to be critically measured and the question of Muslim integration remains. However, Ireland may still provide insight and act as a model for other EU countries in the coming years.

4) Proposals

The economic effects of high-skilled immigration are generally positive for the receiving country. Europe can improve productivity and innovation by focusing on skilled workers and selective criteria (age, education, work experience, language proficiency, etc). Australia, Canada and Switzerland are particularly successful in attracting foreign graduates and high-skilled workers through their 'points' based immigration systems.

a) Europe should follow a similar 'points' model in order to position itself in the global competition for talent. An EU committee that implements and manages policy for

successful migration and integration should be created. One policy mechanism would be to implement a points system where, at a certain level, individuals have access to the entire European labor market. For example, graduates with a Master's degree from a European university are automatically eligible for this status, thus locking in young talent. This system should make it easier for the EU to compete with the U.S., and other countries, for top talent.

b) The EU committee should remove restrictions on intra-EU mobility, as it could be a great source of increased employment rates for countries in which there is a need for labor. In order to facilitate mobility, the EU committee might want to consider a 'minimum wage' in order to attract skilled workers.

c) Work permits should be made more accessible to high-skilled workers, investors and entrepreneurs. Innovative societies compete in a global market through technological advances and improved productivity. The immigration of low-skilled labor may remain at the discretion of the member states, as their specific needs vary greatly.

d) Initiatives must be taken to improve the reception and integration of immigrants in the member states. A good example that all EU members should follow comes from Portugal. In 1996, this diverse country with a large number of immigrants created the position of High Commissioner for Immigration and Ethnic Minorities. This coordinating body oversees everything from ensuring equal rights and eliminating discrimination to promoting foreign culture through multicultural education and ethnic festivals. The future immigration policy of the EU will shape the future demographic. Implementing adequate selection mechanisms and improving the integration of immigrants into society can best achieve this.

V) Conclusion

Demographic change is certainly one of the biggest challenges the European continent as a whole has ever faced. Nonetheless, it has to be stated that this is an opportunity to be a pioneer in learning how to solve the problems stemming from demographic change, which would be in the tradition of Europe as a global trendsetter. (Klingholz, 2009, p.67)

It is far too late to mitigate the consequences, as the decisive developments started decades ago. Therefore, adaptation measurements will be crucial in preparing Europe for a prosperous future (Eberstadt & Groth, 2007, p.58). This paper suggested possible counter-measurements in three directions: strengthening the young local workforce, increasing the productivity of elderly workers and promoting smart immigration policies.

Taking into account the complexity of the issue at hand, it is clear that no single measure or the adjustment of only one lever discussed in this paper will help Europe in overcoming the challenges associated with the problem of a shrinking workforce. It will therefore be necessary to implement an international initiative that integrates all of the proposed measures Europe-wide. Evidently, Europe as a whole needs to tackle this issue as it cannot be solved on a country level.

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Appendix

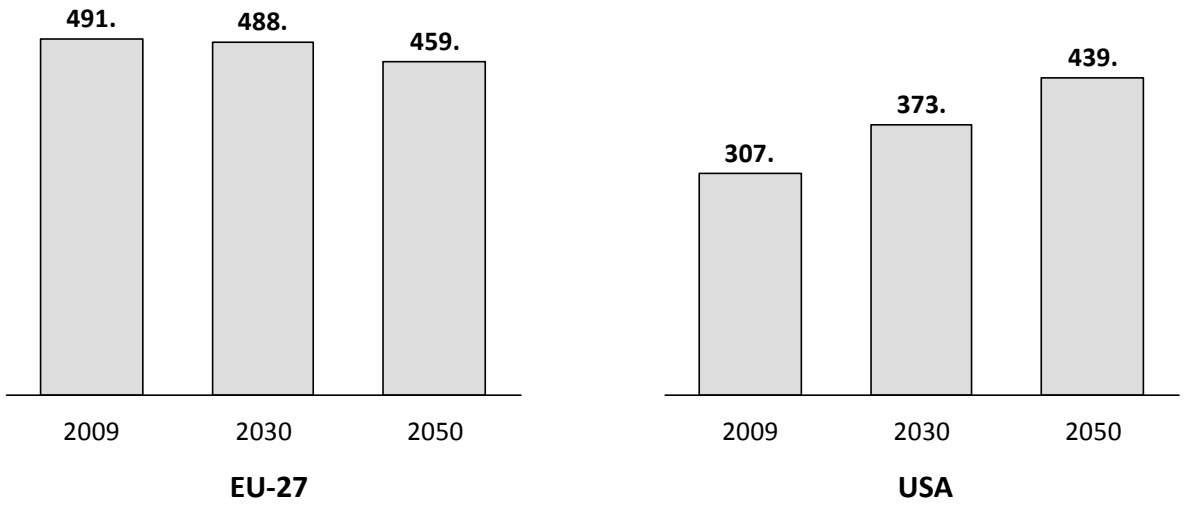

Figure 1: Total population in the EU-27 and the USA in 2009, 2030 and 2050 in millions. (Source: Own depiction based on data from the U.S. Census Bureau, Population Division, retrieved on October, 25.)

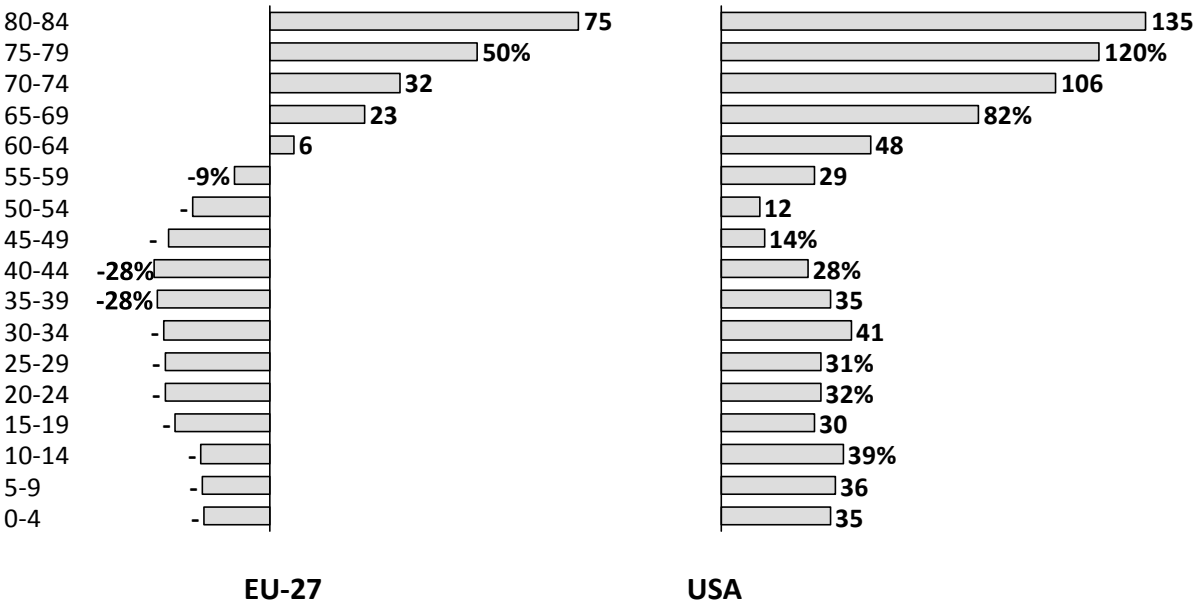

Figure 2: Population changes in the EU-27 and the USA between 2009 and 2050. (Source: Own depiction based on data from the U.S. Census Bureau, Population Division, retrieved on October, 25.)

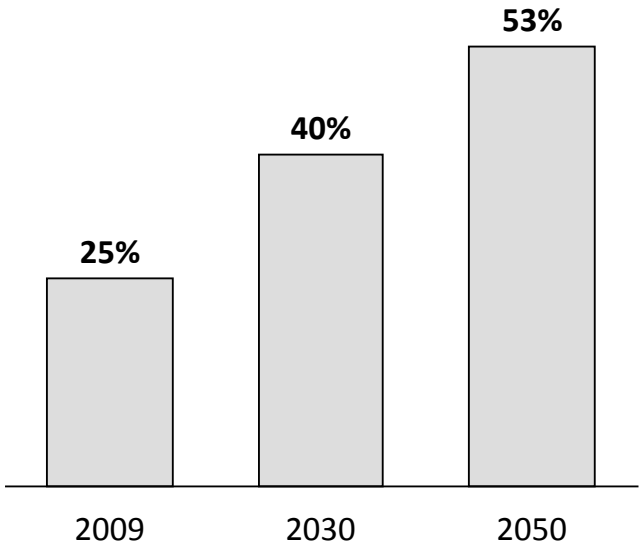

Figure 3: Aggregated view: Old age dependency ratio (15-64) in the EU-27 in 2005, 2030 and 2050. (Source: Own depiction based on data from "Europe's Demographic Future" by the European Commission, 2007.)

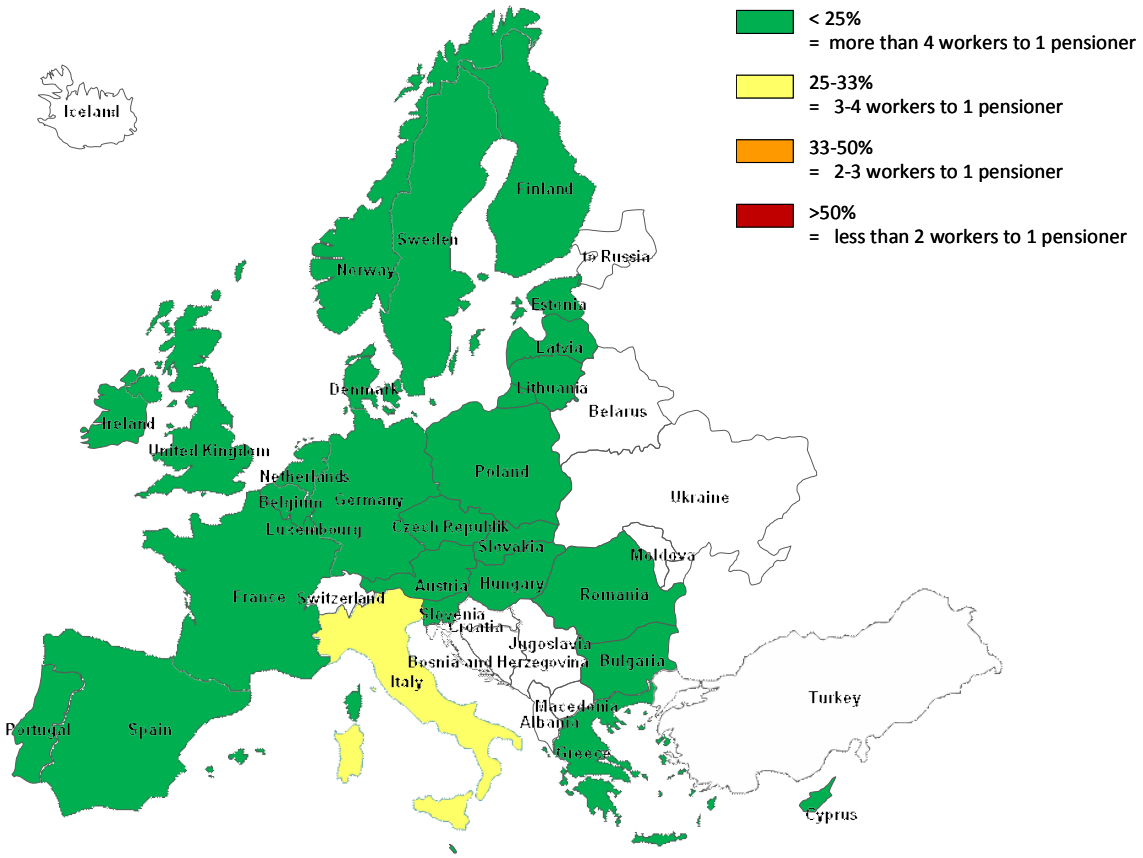

Figure 4: Old age dependency ratio (15-64) in the EU-27 in 2005. (Source: Own depiction based on data from "Europe's Demographic Future" by the European Commission, 2007.)

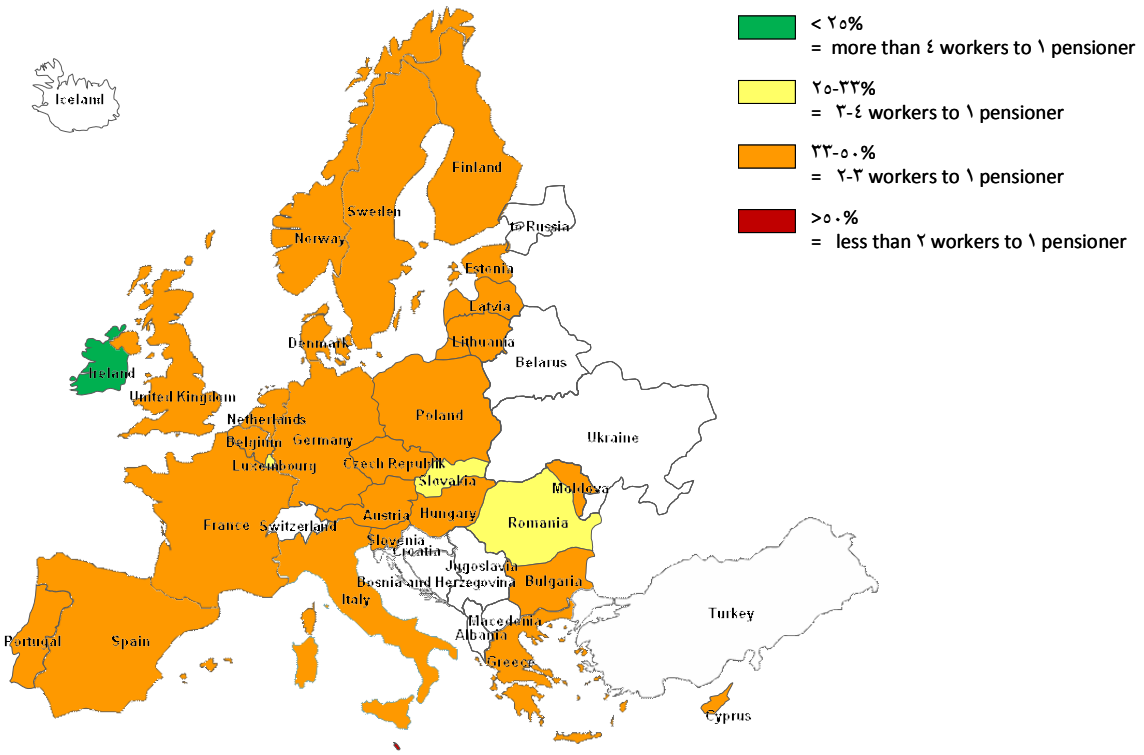

Figure 5: Old age dependency ratio (15-64) in the EU-27 in 2030. (Source: Own depiction based on data from "Europe's Demographic Future" by the European Commission, 2007.)

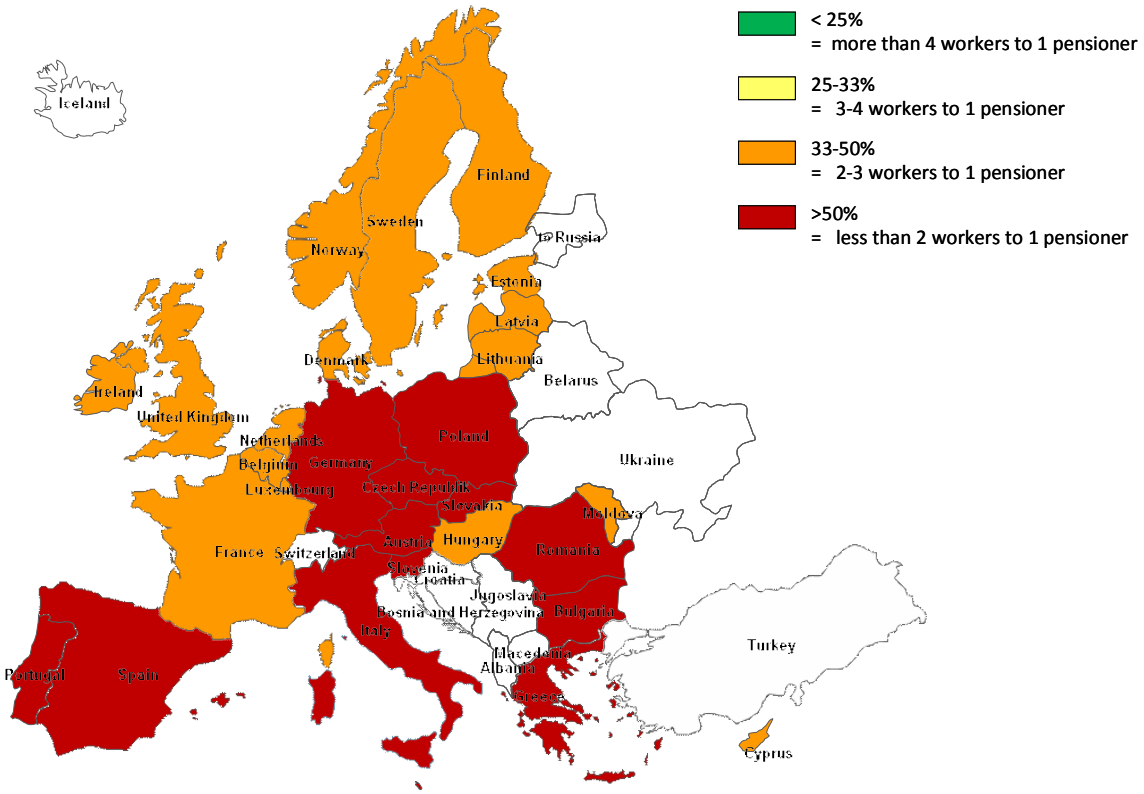

Figure 6: Old age dependency ratio (15-64) in the EU-27 in 2050. (Source: Own depiction based on data from "Europe's Demographic Future" by the European Commission, 2007.)

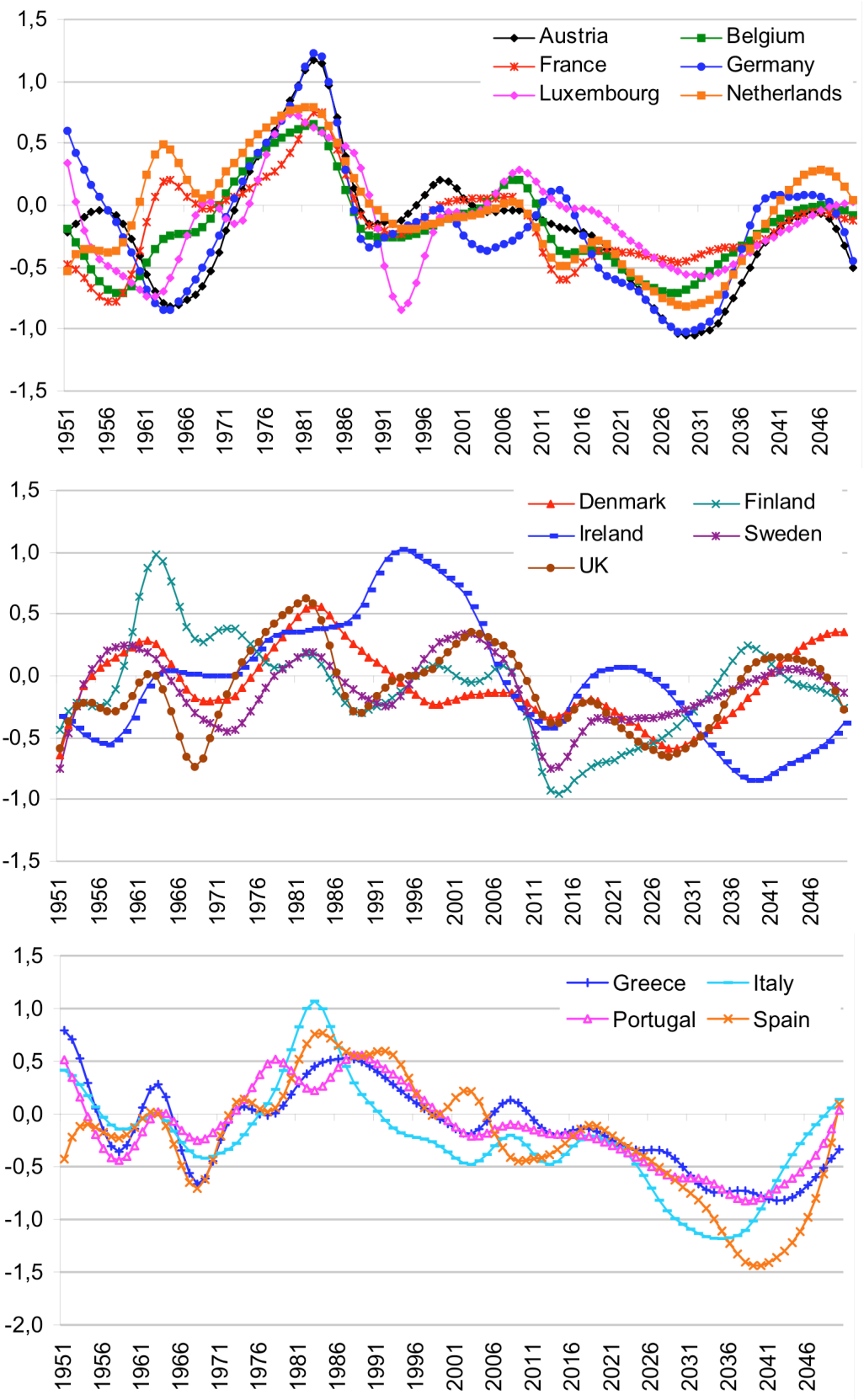

Figure 7: Difference between growth rate of working age and total population. (Source: Prskawetz, 2007)

Economically active population by age (rates)										
Both sexes	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Total (15+)	65.5	65.4	65.2	65.2	65.2	65.1	65.1	65.1	65.1	65
15-19	39.5	38.9	38.1	37.7	37.1	36.4	36.3	36	35.7	35.5
20-24	67.8	67.5	67.1	66.9	66.7	66.5	66.4	66.3	66.2	66
25-29	79.6	79.4	79.2	79	78.9	78.8	78.8	78.8	78.9	79
30-34	82.3	82.3	82.1	82.2	82.1	82	81.8	81.6	81.5	81.4
35-39	83.2	83.4	83.6	83.8	83.8	84	84	84	84	83.9
40-44	82.8	82.8	83	83.2	83.6	83.8	83.8	83.9	84	84.1
45-49	81.1	81.1	81.1	81.2	81.4	81.5	81.6	81.8	81.9	82.1
50-54	74.9	74.9	75.2	75.3	75.6	75.9	75.8	75.8	75.9	76
55-59	63.6	63.9	64.1	64.1	64.5	64.7	65	65.1	65.2	65.2
60-64	45.9	46.5	47.1	47.8	48.2	48.7	48.7	48.8	49	49.2
65+	20	20	20.1	20.1	20.3	20.4	20.3	20.4	20.5	20.5

Figure 8: Economically active population by age, world. (Source: LABOURSTA Internet - http://laboursta.ilo.org/STP/guest)

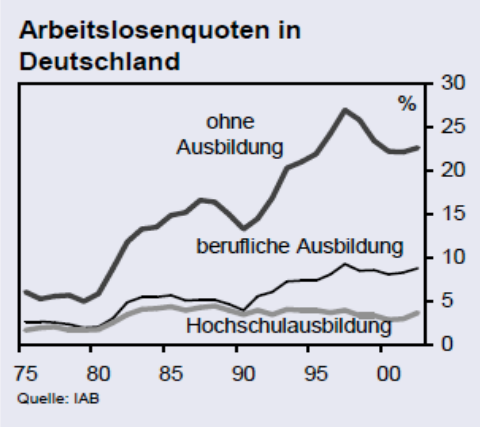

Figure 9: Unemployment quota in Germany, 1975-2005. (Source: Deutsche Bank Research, Paper Nr. 324, p. 6)

Universität St.Gallen

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(HSG)

Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 3

Europe 2030-2050: Conduct an analysis of services/industries, which will gain attractiveness and those, which will lose attractiveness.

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Table of Contents

1 Executive Summary

Problem

From the year 2010 onwards, Europe is going to face a shrinking and aging population. On the one hand, there will be a doubling of persons aged 80 years and older and on the other hand, there will be a decrease in the working population aged between 25 and 59 years. This paper analyses the effects of this change to the age pyramid in order to show which industries and services might gain or lose attractiveness and how the related products and services should be adapted in order to meet the special needs of an aging and shrinking society. Furthermore, possible future products and services will be explored, with a special focus on the older population.

Approach

In a first step, a scenario of a possible conditions relating to Europe and its societies is conducted based on a PESTEL analysis, which covers the political, economic, social, technological, environmental and legal factors. Based on the findings of the PESTEL analysis, possible effects on industries are investigated so as to show which of them might benefit or suffer from the demographic changes. Then, the industries, which might gain attractiveness, and the necessary adoption of products and services due to the fact of reduced abilities of the target group of people aged 60 plus are discussed. When thinking of the future, there might also be completely new products or services offered and they are analyzed using an out-of-the box approach.

Outcome and Evaluation

Considering the fact that the percentage of people aged 60 years and above is going to rise to 34.2% by the year 2050 and the number of 80 year old people is even doubling during this period, the demographic change will have a significant impact on the society in Europe. On the one hand, the change in the age distribution affects political, economic, social, technological, environmental and legal factors and on the other hand, the reduced physical abilities of this group might influence the products and services offered in the future. Industries such as health care, tourism and public transport are likely to benefit from this change whereas the children's toy industry and construction industry are more likely to lose attractiveness. Applying the principles of universal design and considering a rising demand in nursing, there might also be a potential for robots to care for us in the future. Considering the great possible buying power and disposable income of senior citizens, it becomes apparent that the older customers are worth the investment of adapting products and services to their special needs that result from reduced physical abilities such as a decline in visual acuity or reduced motor skills, and longer life experience as well as higher demands. Thus the demographic change can be seen both as a challenge and as a great opportunity for enterprises. Those industries being able to recognize the changed rules and react to this process can most likely take advantage of the increasing importance of elderly people as a customer group.

2 Statistical Foundations – Europe Key Findings

Demographic change is one of the core factors, which will influence society in Europe between 2030 and 2050. In order to determine these influences, a statistical background is laid out in this chapter. The forecasting statistics are hereby based on medium variants.

2.1 Shrinking and Aging population

The overall population in Europe has been steadily increasing ever since World War II. However, around 2010 it will reach its peak with approximately 733 million inhabitants. From this point on Europe will undergo a period of continuous population decline resulting in 691 million inhabitants in 2050 (See Figure 1).

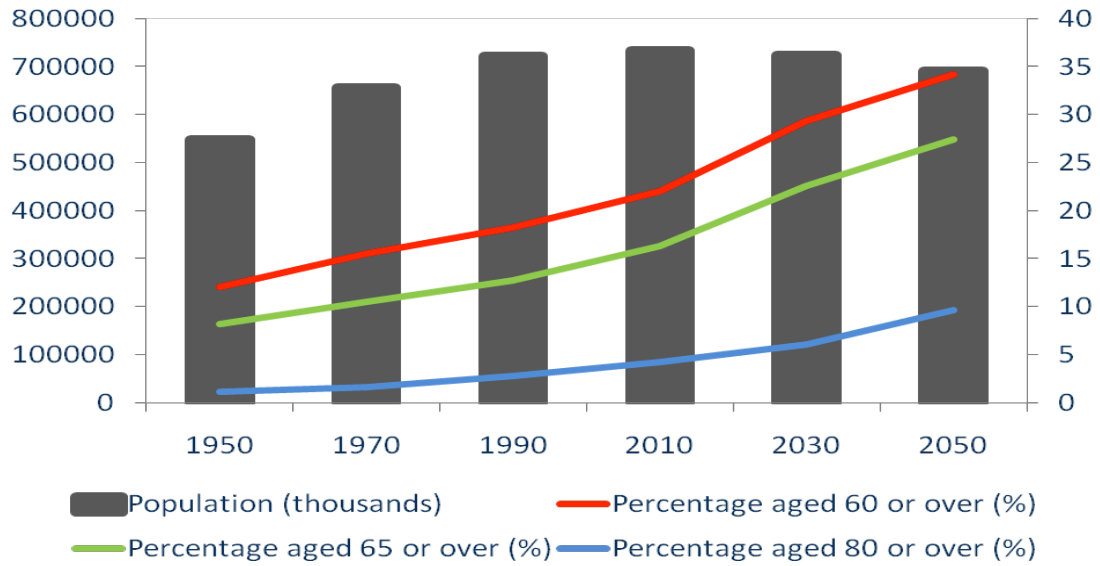


Figure 1: Population Development in Europe 1950-2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

By this time, considering the decline in population, the percentage of people 60 years of age and older, will increase from 22% in 2010 to 29.3% in 2030 and furthermore to 34.2% in 2050 while the majority of the working population aged between 25 and 59 will shrink from 29,4% to 16,3% (See Figure 2).

Contrary, the percentage of people, 80 years of age and above, will double during this time period (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2008). Thus, the structure within the group of 60 year olds and older people will also develop towards a larger percentage of people aged 80 years or older in the year 2050 compared to 2010 (See Appendix 1, Figures 6-7).

Thus, as can be seen from the figure below, from 2010 to 2050 a major shift in Europe's society towards an older population will be observed.

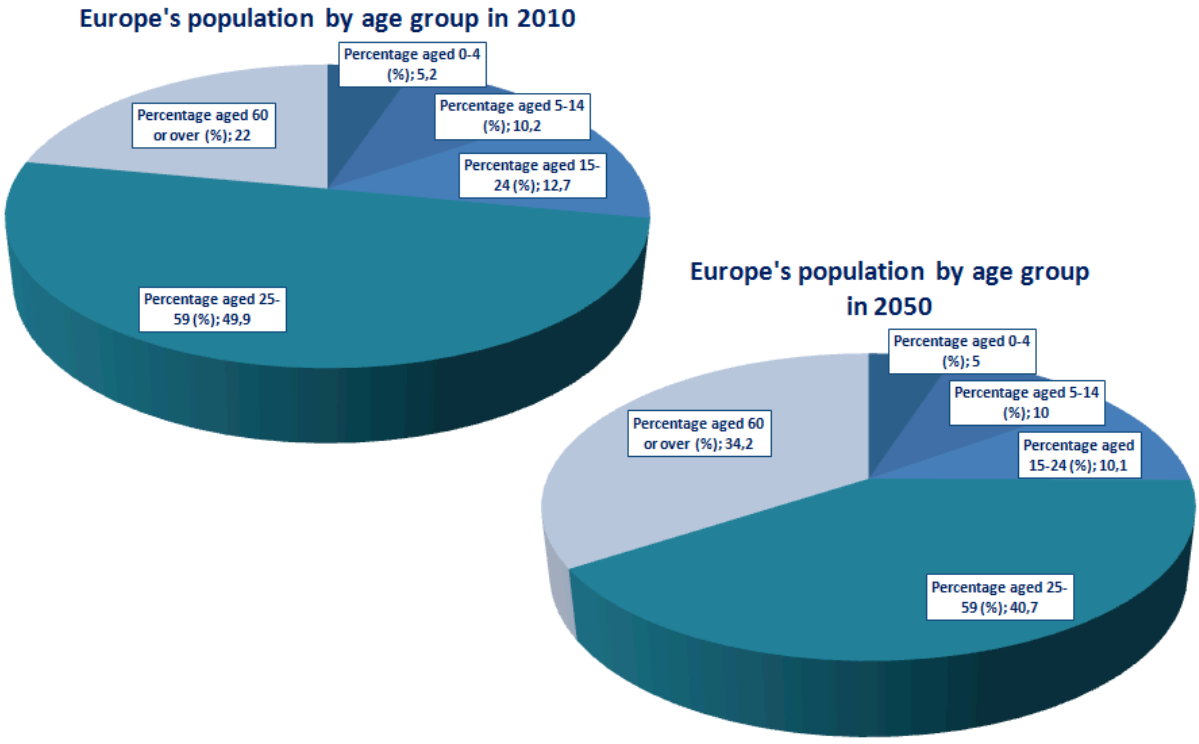


Figure 2: Population by age groups in Europe 2010 vs. 2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

2.2 Sub-areas of Europe: Differences and Similarities

Dividing Europe into several sub-areas of comparable countries (i.e. Western Europe) it can be seen that the development of the population will vary from strongly declining in Eastern Europe (Belarus, Bulgaria, Czech Republic, Hungary, Poland, Republic of Moldova, Romania, Russian Federation, Slovakia and Ukraine) to slightly increasing in Northern Europe (Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden and United Kingdom of Great Britain) (See Appendix 1, Figures 1-4).

However, the common feature of all sub-groups within Europe is the strong increase of elderly people that mainly follows the overall development within Europe as seen above. However, Western and Southern Europe will have the strongest proportion of seniors 80 years of age and older (See Appendix 1, Figure 5).

2.3 Reasons for the observed development

As we could see, the population in Europe is undergoing a significant aging process. This development is explained on the one hand by a very low fertility rate of approx. 1.5 children per woman, which is the EU average in 2008 (Eurostats, 2008) and on the other hand by an ever increasing life expectancy of elderly people. In Germany, for example, the remaining life expectancy of a 60-year-old woman has increased from 19.1 years in 1970 to 24.5 years in 2009 and will further increase to 27.1 years in 2020 (Statistisches Bundesamt, 2009). With continuously improving health conditions this trend is assumed to continue from 2020 until 2050.

3 PESTEL Analysis Europe 2030-2050

The following will show a scenario of how Europe could look in the years between 2030 and 2050. Reflecting on the political, economic, social, technological, environmental, and legal factors that shape a society, the assumptions underlying the forecasted scenario are based on current global demographic trends.

3.1 Political Factors

The demographic trend of an aging society will probably have considerable influence on politics in 2030. With 29.3 percent of Europe's expected population in 2030 to be over 60 years of age, it is reasonable to assume that this age group will have a considerable influence on politics (See United Nations, 2008). The political parties most likely to be in power will largely depend on this age group and thus try to represent their interests. In the future, political decisions that are more in favor of the older population will probably dominate Europe.

Furthermore, the lack of an available labor force will be a topic that needs to be addressed by politicians (See ICPD). With life expectancy rising throughout Europe (See GFK, 2005), it will be a major political challenge to ensure the active participation of the older and still capable workers in the labor market (See Götz, R., 2005). Retirement ages could, on average, need to be raised in order to overcome huge problems with the financing of pensions, while still allowing for flexibility concerning differing physical capabilities of the generation aged 60 plus. New policies will need to create incentives for companies to hire senior employees (See Groth, H., Eberstadt, N., 2007).

Given the reduction in the total workforce, European governments will probably need to establish an efficient education system. On the one hand, it will be essential to offer an improved school system to children in order to generate future potential, on the other hand, it will also be critical that policies encourage the principle of lifelong learning, enabling the older population to engage in educational programs to ensure the persistence of productivity (See Kohlbacher, F., Herstatt, C., 2008). Most likely, only with on-the-job training will seniors be able to participate actively in the workforce.

3.2 Economic Factors

Europe's economy will be strongly shaped by the above-mentioned reduction in the available labor force. A lack of human resources will force the European economy to become more efficient in terms of per capita output but also to increasingly promote the active participation of the older workforce. If this cannot be achieved, Europe might have to deal with the problem of an economic slowdown (See Coleman, D.).

The increased involvement of older workers in the economy will require significant changes to the current policies in place. Especially the unfavourable tax treatment of retirement benefits will need to be altered in order to encourage longer labor participation (See Groth, H., Eberstadt, N., 2008). But also the companies themselves will need to increasingly focus on the needs of their older staff, offering flexible job opportunities to them and adjusting the work place environment to the specific needs of the older population.

The growing influence of the European Union will most likely lead to an increased harmonization of services, taxation and financial rules across Europe (See MCRIT). This trend could further ease business relationships across Europe, and establish a strong Inter-European market. However, due to the overall decline in population size, Europe might have to tackle the problem of a decreasing importance for the world economy.

3.3 Social Factors

The typical family as of 2030 will most likely be characterized by smaller and more hybrid structures. Already between 1975 and 2004 the total first marriage rate in Europe dropped from 88 to 57 percent. In the same time frame, total divorce rates rose from 17 to 36 percent (See Groth, H., Eberstadt, N., 2008). This trend is most likely to continue into the future because the shrinking population creates an increasing need for female participation in the workforce thus further preventing the founding of families. The fertility rates in most knowledge-driven societies are expected to remain beneath reproduction level, thus further adding to the aging of society (See Groth, H., Eberstadt, N., 2007). Furthermore, there will be a growing number of single households among all age groups in Europe (See Metrogroup). The number of households with two or less people compared to overall households will increase by at least 5 percent until 2020 in Germany (See Statistisches Bundesamt, 2007). Especially in the segment of people aged 60 plus, a growth in the percentage of seniors living alone will be observed (See GFK, 2005).

Immigration as a means to maintain population size will become an effective way to fight depopulation in European countries. Especially selective immigration to ensure qualified labor immigration will be of great importance (See Coleman, D.). Still, immigration as a whole will be a huge determinant of societal structures in 2030. With an increasing number of immigrants throughout Europe, effective integration, and coexistence of the various cultures will be essential for Europe to effectively benefit from the increased workforce basis. Most likely the majority of low-paid jobs will be performed by less qualified immigrants. Despite the great opportunities that lie within the constant streams of immigration, Europe will also need to face the threats that stem from ineffective integration causing unemployment and social problems (See Groth, H., Eberstadt, N., 2007).

In addition, women will contribute to a large portion of the workforce. The traditional role model of women staying at home with the children might cease to exist. Instead, a more flexible understanding of gender roles will likely be in place. A flexible family structure marked by two-earner households might exist in most European countries, enforced by the lack of labor force (See Coleman, D.).

With the improved health in Europe, a more active group of seniors will emerge. People aged 60 and above in 2030 will be educated as no generation before. They will actively participate in, and shape society. Furthermore, as one of the groups with the highest disposable income they will influence societal developments. They will also have the time and money to consume all kinds of products and services, representing a significant consumer group. More and more European societies will experience a dependency on these older people (See GFK, 2005).

3.4 Technological Factors

Given the fast technological advances, physical labor will no longer be a job requirement in typical European workplaces (See Groth, H., Eberstadt, N., 2008). This will allow the older population to remain active in a service and information based economy. Advances in health care will most likely further add to the increasing health of the older population, making them available to the job market for a longer period than today. Aging Support and Biotech will, in alliance with this, most probably continue to experience significant technological advances.

The increased age of the European population will eventually lead to significant revolutions in the sector of supporting technologies. Infrastructures will further need to be adapted to the needs of older people. Future technological advances will need to ensure the usability of innovations throughout all age groups. Universal design will be an important success factor for companies (See Herstatt, C., Kohlbacher, F.).

Additionally, Europe will probably be dominated by a trend towards increasingly environmental friendly technologies. On the one hand saving energy will be a major topic and on the other hand environmental friendly energy will also contribute to a main portion of the European energy supply in 2030, with a decreasing importance of traditional energy sources (See MCRIT).

3.5 Environmental Factors

The scarcity of natural resources and global warming will eventually result in an increased awareness of environmental issues in Europe in the future. The previously mentioned renewable energy sources will gain importance due to customers' awareness of their surroundings.

Sustainability will be of major importance to the public (See MCRIT). Production methods and products will be designed to ensure minimal environmental pollution. Customers will most likely make increasingly environmental-friendly choices.

3.6 Legal Factors

Demographic Changes will require changes in several areas of legislation. A major topic will be employment regulations throughout Europe. With the need for a qualified workforce, a more flexible hiring and firing legislation will make employment of older workers more attractive to companies. Benefits will need to be based on actual performance rather than seniority. Today a huge number of seniors remain unemployed because companies are afraid of them being "profit-killers" (See Groth, H., Eberstadt, N., 2008).

Social legislation will have to deal with promoting double-earner households that were previously mentioned. Increasing the availability of childcare as well as ensuring favourable tax treatments for families with children, will ensure on the one hand a higher participation of women in the workforce, and on the other hand prevent further declines in fertility rates. Europe could overcome the problems of a diminishing workforce by increasing the

percentage of women working and by increasing the time period that people remain active participants in the labor market.

Overall, it can be expected that a similar legislation will be implemented throughout all European countries, with only slight adaptations to cultural specific circumstances, due to the previously discussed consolidation processes. Again, this will make European countries converge closer to being one community with similar legislation.

4 Emerging Industries

The following will provide an overview of those industries that will most likely benefit from the demographic trends identified in the statistical section and in the PESTEL analysis of this essay. Given the high uncertainty involved in the forecast of our scenario and the many and yet unknown technological advances that will most probably take place in the future, this section on industries benefiting from demographic trends can only provide a starting point when analyzing market compositions in 2030 and beyond. In chapter 5 more detail will be given on the concrete measures of adapting already existing structures to the needs of a changing environment. An overview on attractive areas with a high potential for innovation can be found in Appendix 2. It will be important to work on tools, visions and concrete steps to match demand and supply for products specifically designed for older age groups, and to ultimately find an easy common language to communicate and comprehend each other. Industries in Europe between 2030 and 2050 will be shaped by newly developed concepts, services, and products but also by the need for adaptations to already existing industries in order to remain competitive.

4.1 Health Care Industry

With the number of old people significantly increasing, preventive and personalized medicine will gain huge importance in the future. Moreover, technological innovation together with the need to deliver quality healthcare at lower costs will offer opportunities for the development of new types of products and services. For example, treatments based on the patient's personal genomic and proteomic makeup will allow more targeted treatments, which are more effective and also cheaper (See P. Mertens, S. Russell, and I. Steinke) Furthermore, communication technology will probably improve dramatically the efficiency in health institutions, reducing costs for patient communication and monitoring. Already today, seniors account for the largest proportion of the self-medication segment in countries such as Germany (See GFK, 2005). With life expectancy growing, the risk that older people suffer from old-age diseases grows as well, creating new market potential for pharmaceutical companies. The health care sector is one of those industries that will most obviously benefit from demographic developments. With the number of elderly people growing in Europe between 2030 and 2050, the need for care and medicine will rise as well.

4.2 Transport Industry

This industry will see major developments and changes in the future years. Mobility is vital in maintaining an active lifestyle, especially for the generation of seniors in 2030-2050. This generation grew up with private cars and universal driving licenses. "For the generation now moving into retirement, personal transport is synonymous with freedom, dignity and

security“ (Coleman and Harrow, 2000). Both society and the automobile industry will need to find a solution for the future safe mobility of people aged 65+. The transport industry can benefit from demographic developments by taking into account the changes in age composition of societies. Technological advances and the increasing trend towards environmental friendly solutions will ensure an increasing demand for new transportation solutions. Mobility is an essential need for modern society. With more elderly people engaging in the workforce, comfortable transport solutions will need to be found. These trends will have an impact on transportation planning, the design of urban areas, car design and public transportation, etc. (See J. Meyer). The constant need for improvement in the transportation industry will help this sector to benefit from global demographic changes.

4.3 Retail Experience Industry

Today, the segment of retail experience is in an experimental stage. Customers are still used to purchasing products in traditional shopping places. With the Internet slightly taking over traditional point of sales purchases, a shift in shopping behaviour can be observed. With the number of older consumers growing, the retail experience industry will gain importance. In order to remain competitive against online shopping, retail stores of the future will need to ensure that shopping will be based on the superior experience and less on the simple process of buying. This will make the key difference between purchasing on the Internet and visiting a store. Even if today this trend is just emerging, changes in the retail industry can be observed: from comfortable lounge areas and massage couches to shopping carts with a seat - shopping experiences might even become 3D.

4.4 Tourism and Leisure

Tourism and leisure is also one of the industries that, as a whole, will benefit from demographic transformations. The increasing number of elderly people is especially beneficial to tourism: seniors show higher travel intensity than younger people. In Germany, 15% of the journeys are made by people over 64 years of age. The demographic trend of smaller and fewer families will significantly hurt traditional family vacation destinations. The great opportunities for the tourism industry rather present themselves in typical destinations and offers for older consumers and singles, such as city tourism or boat cruises.

5 Shrinking Industries

There are many industries that will probably lose attractiveness given demographic changes and new customer demands unless they are able to turn around their business models.

5.1 Toy and Children Industry

Obviously with fertility levels remaining low, less stable family structures and less women getting married, the demand for traditional child products will experience sharp declines. It will be a huge challenge for this industry to compensate for these losses by adapting their product offerings to new customer groups or other measures. With the younger generation continuously declining, the demand is not likely to recover. Without significant changes in industry structures, Europe in 2030-2050 will not offer an attractive market environment for this sector.

5.2 Food and Beverage Industry

Eating and drinking are basic human needs, ensuring constant individual demand. However, with the overall population size going down, and the fact that most elderly people consume less food than younger consumers, the overall demand will decline. The food and beverage industry will largely suffer from the demographic trend of an overall declining population in Europe, enforced by the increasing number of seniors. Furthermore, the trend towards female participation in the workforce, smaller families, more single households, and older consumers will require significant innovations in this sector. Companies that assess the needs resulting from demographic change in time could largely benefit from this development. However, taking a look at the industry as a whole, a decline in the overall market volume will most probably be observed.

5.3 Construction industry

Given the decline in population, less demand will exist for additional housing. The already existing supply of housing will most likely exceed demand, thus inducing a price drop, making the construction of new buildings financially unattractive. The construction industry will mainly focus on adapting existing facilities to changing needs and modernization, and to accommodate a wide spectrum of consumers. The construction sector will largely suffer from decreasing demand since the need for changes and modernization will not be able to compensate for this decline. Concerning construction contracts with public institutions, the massive investments in infrastructure in the current years make it highly doubtful whether this sector will be able to save the whole construction industry. It is more likely that the overall industry will experience declines.

6 Products and Services in the Europe of 2030-2050

6.1 Thinking of Better Products and Services for the Elderly is Worthwhile

The higher life expectancy of the European population is a giant chance for the economy (See Gassmann, Reepmeyer, 2006). Already in 2003 a study from the Institute for Technology Management at the University of St. Gallen illustrated the importance of adapting products to the needs of older people (See Gassmann, Reepmeyer, 2006): 85% of the polled Swiss companies regarded products that were specifically tailored to the need of elderly customers as important. As many as 59% of the respondents anticipated that products designed on an age-basis would generate superior growth.

A benefit that is often underestimated is the so-called “magnifying-effect“. By concentrating on a very demanding customer group, in this case seniors, special requirements that also concern younger consumer groups can be observed. Focusing on this challenging group can function as a magnifier that enlarges the needs of all consumer groups, ultimately resulting in new innovations for other age groups and “generating interesting growth impulses“ (Meyer-Hentschel, 2008/2009).

6.2 Future Customer Trends - The Customer Segment 60+

Given the increasing importance of people aged 60 plus, this chapter will provide a brief insight into the customer segment of seniors. Already today, the older generation possesses a higher purchasing power per person than the generation aged 49 and above. Since today's individuals who are in their prime years have accumulated a lot of wealth and will largely contribute to the older population in 2030, it is likely that the financial situation of senior citizens will even improve, despite decreasing pensions (See GFK, 2005, see also Ribi, 2009). This can be illustrated by the fact that a married pensioner in Germany who receives less than 275 EUR of social pension payments a month has an average total net income of 2.400 EUR (See AsiD, 2003). This financial attractiveness of the older customer segments further highlights the importance of gaining insights into this generation.

Concerning shopping habits, older customers tend to shop more often but spend less on a single shopping trip. Their purchasing patterns are characterized by short-term stock keeping. The main reason behind this behaviour can be found in the increasing availability of time that seniors possess in comparison to younger generations.

In this regard, another very important characteristic of senior customers is their brand orientation. They highly value quality and add-ons. They are less price-sensitive than younger generations, and usually prefer established brands to lower prices (See GFK, 2005).

Another fact which should not be neglected is the rising life expectancy: the lifespan of a 60-year old man is currently 80 years in Germany and even 84 years for a 60 year-old women. If companies are able to acquire a 60-year old woman as a customer, the customer relationship with her can statistically last for 24 years. In this context, the findings of a study from Denmark (published by Christensen et al. in Proceedings of the National Academy of Sciences) are also of importance: "(…) for both women and men the evidence clearly signals that a longer life does not in itself mean an extended period of dependency" (Kirkwood, 2008). Even though they have a shorter life expectancy, men are especially likely to experience longer periods of independence. This fact of longer life periods combined with a growing chance of independency in age can have positive impacts on the industries having the seniors for longer as their customers. Nevertheless the demand on products and services is dependent on their adaptation to senior customers' needs. If products and services will not fit their special desideratum, the demand will probably not rise despite their buying power (See Gassmann, Reepmeyer, 2006).

6.3 Age-related Physical Changes

Aging is not a physical destruction process. Far from it: the mental achievement potential often rises with ages. This is the reason why seniors are superior to most young people in terms of experience, assertiveness, discernment, endurance and creativity. Nevertheless, there are also negative age-related changes. First there are the restrictions in vision. Senior people often suffer form a vulnerability to handle glare and reflections. Due to the fact that the lens of the human eye changes its colour from clear to light brown by the age of 80, colours are perceived differently than in younger years. Additionally, elderly people need to deal with reduced motor skills, particularly the hands will be affected by the ageing process: a 30-year old man will experience a loss in strength of up to 45 percent by the age of 70. Furthermore, the manual dexterity and flexibility of the hands will decline, which can also

result in problems when applying pressure. Given these physical changes, it is fundamental to adopt products and services to the special needs of this target group of people aged 60 plus.

6.4 Universal Design

In the past years the approach of adapting design to the special needs of a small group has changed to a design for everybody (See Preiser, Ostroff). Universal design is defined as: "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (See The Center for Universal Design, 1997).

6.4.1 Seven Principles of Universal Design

The Center for Universal Design of the NC State University defined seven principles of universal design and the corresponding guidelines one should follow to meet the requirements of universal design (For detailed explanation see Appendix 3).

- Equitable Use: "The design is useful and marketable to people with diverse abilities"
- Flexibility in Use: "The design accommodates a wide range of individual preferences and abilities"
- Simple and Intuitive Use: "Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level"
- Perceptive Information: "The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities"
- Tolerance for Error: "The design minimizes hazards and the adverse consequences of accidental or unintended actions"
- Low Physical Effort: "The design can be used efficiently and comfortably and with a minimum of fatigue"
- Size and Space for Approach and Use: "Appropriate size and space is provided for approach, reach, manipulation and use, regardless of user's body size, posture or mobility".

These principles of universal design affect different areas of the economy and of public life. To get an impression on how to adopt these parts to the needs of a shrinking and aging society, a differentiation will be made between: product design, packaging and services. In a further step the text will focus on the most important aspects within these different categories.

7 Adaptation of Services

As shown in the previous discussion, there are some industries that can benefit from the changes related to the demographic change. However, these industries may only gain attractiveness if they are successful in adapting their products and services to the needs of older people, especially to the target group of people aged 60 years plus.

Due to the direct contact to customers, it is important for industries to adapt their services to the needs of older people. As a result of their life experience, the elderly tend to have more discernment and better critical thinking skills. Therefore, they expect higher standards from the services they are using and want to stay independent as long as possible (see also Ribi, 2009). Additionally the physical restrictions should not be neglected. In order to offer services, which are suitable for older people, it is on the one hand important to train the members of staff and on the other hand to adapt the environment where the service is offered.

7.1 Tourism

As people are getting older, they also have more free time. The fact that today many elderly people are healthier and more financially independent makes them an attractive customer group. Yet for the travel business, the demographic change is both a challenge and an opportunity. Due to their experiences in life and travel, the group of people aged 60 plus can be very challenging in their prospects (See DRV, 2009). The huge diversity of older people further adds to the complexity of adaptations for this group. As there is not a typically older guest, it is very challenging for the tourism sector to offer services. What seniors want the most are customized services and no “senior programs“ (See Frei, 2005). Together with the offer of customized services there is also a great need for trained employees whose qualification should be geared towards the specific requirements of this target group. In this context communication during the consultation but also during the entourage on the journeys plays an important role for older customers.

7.2 Retail

The changing population structures also have a significant influence on the retail business: as there are fewer inhabitants, there are also fewer customers. In order to meet the requirements of those shrinking customers who are also becoming even older, business will need to change its strategies (See Metrogroup). To tackle these problems the Metro Group developed a possible scenario of barrier-free shopping in 2020. The shopping process was designed to be possible for all age groups. The corridors should be wide enough to get through them easily even with different utilities for the disabled and any product should be reachable without any problems. If customers should need further information about products or their ingredients, there would be information terminals providing the required information. At the end of the shopping process, the customers would not have to show all the items because they would have been scanned already automatically in the caddy. Already today there are the first visible approaches to this development: in many stores there are seats and caddies, which are easier to drive, and signs for an easier orientation. These aspects are especially important considering the reduced physical abilities such as reduced power and the restrictions in eyesight of seniors (See The Metro Group, 2009).

8 Adaptation of Products

8.1 Focusing on the Packaging

Most of the time, the first impression customers get of a product results from the packaging. Due to the fact of an ageing society, which comes along with age-related restrictions, especially in terms of vision and haptic aspects it is important to focus on a design, which is adapted to the special needs of older customers. Therefore, the following will focus on the requirements of senior friendly packaging. In consideration of the fact that there is a rising fraction of older people in the population, there are specific requirements regarding the design of the packaging that will be reconsidered in the forthcoming section.

Due to the reduced ability to see and the fading of power and dexterity, older consumers prefer packaging which provides easy handling and offers more convenience (See Bergmann, 2008). To make allowance for these aspects, the appearance and opening of packaging has to be considered.

8.2 Appearance

If you are thinking of packaging that is adapted to the needs of the elderly, maybe the most important point is not to design a packaging specifically for older people. They are a highly sensitive group of customers that still want to feel young and do not want the packaging to "tell" them that they have become old. This fact means concentrating on the point of providing "respectful" packaging, which does not aggrieve older customers by having very large print or openings and at the same time supplies important information and is easy to open (See Salvenmoser, 2008).

8.2.1 Readability, Determination and Recognition

Most problems result from an overload of information such as product description, ingredients and nutrition facts on the packaging. The amount of information, due to its very small print, which is presented as art design, can lead to diminished readability. If companies want to attain the target audience of older people, it is important to focus on the two following aspects related to readability. Considering the fact that the perception of colours changes, the utilization of colours, which will be experienced very similarly, should be avoided. Otherwise there might be reduced readability and problems with differentiating the specifications and brands. The challenge in deciding on the right print size expresses itself in the fact that older customers do not want very small or large print, which tells them that they have become old.

8.2.2 Easy Opening and Closing

A study conducted by Pro Carton 60+, during which customers aged 60 years plus were interviewed about problems with packaging, came to the conclusion that the most important need is "easy opening" (72%). This fact is also backed by a set of studies during 1999 and 2003 by BAGSO in cooperation with the Meyer-Hentschel Institute. 70-75% of the respondents claimed that the opening mechanisms did not work and that too much power was needed (40-45%). Especially packaging with an opening mechanism that requires fine

motor manipulations and power in the hands possesses problems. Plastic containers that are welded are the most problematic ones. Even the unfolding of cardboard boxes can be a problem for older people. If the packaging is not uncomplicated to use, many old customers could respond by choosing an alternative another brand or product (See Bergmann, 2008). Packaging that is difficult to open will unnerve the consumer, because they draw attention to the restrictions associated with their age. Therefore, "the required handling of a package should not put its purchaser's agedness on display!" (Pro Carton, Study 60+).

What older customers want the most from packaging is:

- Easy to open and reseal
- Information that is clearly readable
- Easy to recognize and find

Packaging that offers these conveniences are courteous because they allow older customers to forget their frailties and declining abilities (Meyer-Hentschel Institut).

Figure 3: Can also be opened when suffering from arthritis.
In 2007 Nestle developed this innovative screw top for tubes.
It requires less strength to open and has an original look.
Source: www.nestle.com

8.2.3 Example: Packaging of Pharmaceuticals

Already in 2005, the percentage of self-medication in the age group of 60 plus amounted to around 52%. Considering the rising number of people in this age group, it can be assumed that the part of self-medication is going to rise up to 70% by 2030 (See GFK, 2005). For this reason, it is especially very important for the pharmaceutical industries to focus on senior-friendly packaging. In this context, two parts of a packaging need to be considered: the primary packaging, mostly the blister packaging, and the secondary, the carton.

The Helen Hamlyn Institute offered in its "guide to the graphic design of medication packaging" (The Helen Hamlyn Research Centre and The National Patient Safety Agency, 2007) some recommendations for pharmaceutical packaging (Further illustrations in Appendix 4): the medicine's name should be on each pocket in order to afford readability even if there are some pills taken, furthermore, no reflective foil should be used because of the higher vulnerability to glare and reflections. Recommendations for secondary packaging were to use graphical differences between look-alike medicine names, and to use colours to emphasize differences between the strengths of a medicine. Additionally, there should be matching styles of primary and secondary packaging in order to allow an attribution of the primary packaging to the secondary one because of the risk of mixing blisters to the wrong carton. This importance of adopting pharmaceutical packaging to the needs of older

customers was also discussed at the “Easy Opening“ Workshop in Dresden (VVD 2009-Workshop “Easy Opening”, 2009).

8.3 The Product Itself

Not only the packaging, but also the product itself has to be adapted to the needs of the growing group of older customers. About half of the elderly are facing problems when using technical products. There is the danger of reduced consumer acceptance if problems are expected when using the products (Meyer-Hentschel, 2004). Consequently it is important to regard the needs of the user and not only the design and aesthetics. According to Voehringer (DaimlerChrysler AG, see Meyer-Hentschel, 2004), “the expectations of a product are always mentioned by the generation which engraves the market”.

The challenge will be to develop products, which fit with the principles of universal design in order to meet the needs of all customer groups, but especially those of our aging society. It is not about developing products especially for the elderly that would discriminate them and eventually would not have any chance in the market.

8.4 Example of a good product: Big Easy 3

Figure 4. Big Easy 3 Source: fitage.de

Due to the fact that older people are often less mobile, the connection via cell phones becomes increasingly interesting in order to stay in contact with other family members and friends. However, some older people are facing difficulties in using their cell phones because of the buttons and print being too small or the software being too complex. The company “Fit Age“ (See fitage.de) responded to the changing market situation. They developed a new kind of cell phone, which can be used by older people easily without looking like a senior cell phone. On the one hand the buttons and letters are easy to read and has a rubber like touch so that also people with reduced dexterity are able to use it, and on the other hand it is not too large and looks similar to a normal cell phone (See fitage.de).

9 Which new products/services might emerge?

Concerning our aging society, not only the established industries might gain attractiveness but also completely new industries or services that are not yet in existence. With the rising number of older people, there is also a rising demand on services and products that on the one hand fit the principles of universal design, and on the other hand are geared towards the needs of seniors.

9.1 Assistance Insurances

One new service, for which there was not a prior need, is the so-called assistance insurance. Additionally to the usual insurance, people get further insurance benefits such as “senior accident insurances”. The innovation here is that in the case of accidental insurances seniors also get help with their household activities, e.g. they can be accompanied to the doctors or their pets are cared for. These services become increasingly important as a rising number of older people are living alone at home. This offer of additional help is especially necessary, if

no assistance from the family is possible, which might happen often due to a rising number of single households (See Heilmann, 2006).

9.2 Reverse Mortgages

Considering the situation that some older people might need more money than they get from their retirement provisions, there could be a possibility of having “reverse mortgages”. People can mortgage their houses and receive monthly pensions while still having the right to live in their property. This model could be interesting due to the fact that more and more people are childless and therefore will not bequeath their property to somebody. With the money from these reverse mortgages they can close possible shortages in their pensions (See Knoppik, 2008), (See also Iwata, 2004).

9.3 Flavourful Innovations

Getting older is often related to physical restrictions. Especially important for the food industry are a reduced sense of taste and smell. As a result, between a five and ten time higher concentration of flavour is needed for people aged 60 plus. To tackle this problem, scientists from Bochum and Oberhausen developed a first approach: using a special method (See Fraunhofer Institut, 2006) by which liquids can be turned into powder and can be contained in very small chocolate balls that free up liquid aromas in the mouth. In the future this could also be used in combination with fruits because of its ability to cling to the fruits. When eaten, the powder melts resulting in a totally new sensation of taste (See Meyer-Hentschel, 2008).

9.4 Senior Products: High-Tech Pill Box

Living as independently as possible is already a trend among elderly people today and will continue to be of increasing importance in the future. Being able to stay at home equals a greater quality of life for most seniors but it can also result in some problems. Many of the elderly need regular medical treatment and are therefore obliged to take certain pills at a particular time. This can be confusing for elderly people, as they tend to forget their medication, have problems in finding or opening the pillbox, or are unsure if they already took their pills.

The solution to these problems could be an electrical pillbox, which is easy for the elderly to handle but also safe for children. Seniors would wear a bracelet, which is individually designed and vibrates whenever there is a need to take medication. The vibrating feature means that it can be easily found such as in the case of it having been forgotten somewhere. Then, by tapping the bracelet close to the box it rotates directly (radio-controlled technology) to the part with the correct pills for the given time and opens just this part of the box. This way, the senior could not accidently take the wrong pill and it is safe for other people like children. The box would just need to be filled once a week, which could be done by a relative or a caretaker who makes a weekly house visit. In the case of couples who live together and when both partners need to use the box, it would be delivered in different colours in order to avoid a mix up. By solving this fundamental problem with the use of this new electrical pillbox, the elderly could experience a higher quality of life as they would be able to live at home for a much longer period and would not need to move into a nursing home.

9.5 Future Vision: Self-driving Taxis

As illustrated in the previous sections, mobility is of great importance to the elderly. However, as they face physical restrictions, it is often not possible for old people to drive a car on their own. Due to this, the scenario of self-driving taxis could be an advantageous solution for the future. The elderly would be able to drive without the need of a taxi driver and could pick one up from any desired location. As the recognition of speech would be an included feature, problems with reading small displays or control elements would be overcome. Even the payment process would be very easy: the user could identify himself by his fingerprint which automatically charges his credit card. This future vision could solve some of the problems in transportation due to age related physical changes and would function as a helpful alternative to private cars in the future.

9.6 Future Vision: Caring Robots

Given the fact that already in the year 2000, the ratio of care personnel to high-maintenance persons was 1:9 and that this ratio will rise even further by the year 2050, new ways of caring will be required. Caring robots could be a solution for this problem. By doing physically demanding and standardized work such as putting someone to bed or changing clothes, robots could unburden nursing staff who would therefore have more time for individual care. In Japan, a robot called “RI-Man” already exists, which can be used as a caretaker for the elderly. “RI-Man exhibits the skill and ability to realize human care and welfare tasks” (Riken, 2006). He has ears that he can use to localize sounds and can track human faces. Moreover, he is also able to monitor the state of health of his patients by analyzing breath (See Riken, 2006). The Fraunhofer Institute have also developed the “Care-O-Bot”, which could function as a home help for older people. Because of its flexible “hands” it is able to grab bottles, dishes and other household articles. Furthermore, it can also be used as an intelligent walking frame (See Fraunhofer, 2009). This vision of robots caring for us might be seen as a chance towards a more independent life in old age.

10 Conclusion

Having a steadily increasing population since World War II, Europe is going to face a period of a shrinking society resulting in 691 million inhabitants in the year 2050. Given the fact, that contrary to the shrinking working population aged between 25 and 59 years, there will be a significant increase in the percentage of people aged 60 years and even a doubling of the percentage of people aged 80 years and above; it therefore becomes clear that this development will also affect the composition of the age pyramid. Thus, the demographic change is probably going to have an influence on different aspects of the society in Europe due to economic, social, technological, environmental and legal factors.

Some industries, such as the health care industry, tourism, retail and the transport industry are likely to benefit from the changes related to the demographic change, whereas the food, toy and child industries, or the construction industry, might suffer from reduced numbers of customers. Common to these industries is the probability that they will only be able to benefit from the demographic change if they can adopt their products and services to the

needs of the new target group aged 60 plus. Due to reduced physical abilities such as restrictions in vision or reduced motor skills combined with higher demands resulting from longer life experience, products and services should meet the requirements of universal design. For products, probably packaging is the most important aspect to be adapted since easy opening and readability play an important role. When considering services, older people expect higher standards and do not want to be treated as “being old”. Those industries being able to adapt their services will probably benefit from a customer group, which is characterized by healthy longevity, brand and quality orientation and a high purchasing power due to a significant amount of disposable income. Taking into account the so-called “magnifying-effect“, the focus on this demanding group of customers can enlarge the needs of all customer groups, which might result in new innovations for other age groups. The demographic change might not only affect established industries and services but may also lead to completely new ones because of the needs, which the former target group of young people did not have. Future visions, such as self-driving taxis, high-tech pillboxes or robots caring for us could be possible in 2050.

Appendix

Appendix 1

Figure 1

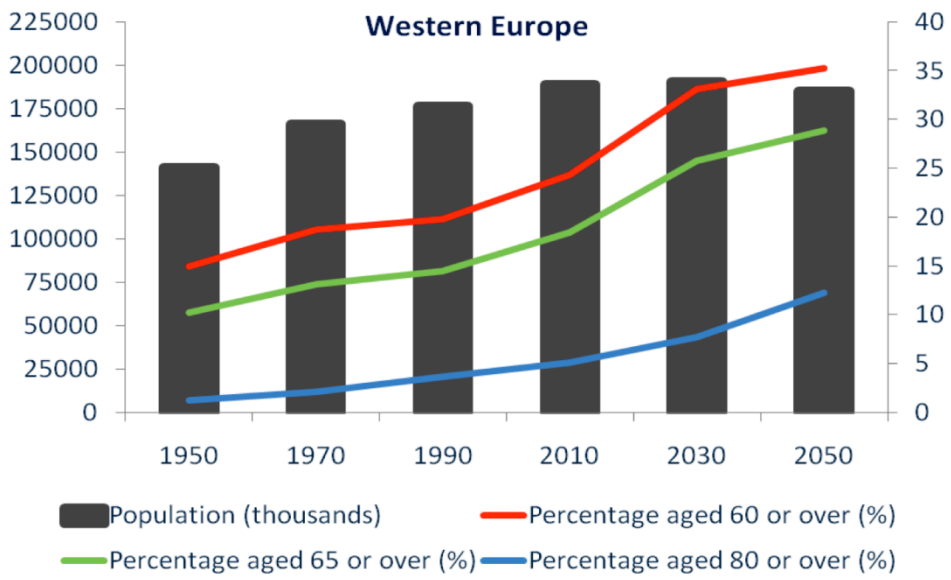


Figure 1: Population Development in Western Europe (Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland) 1950-2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Figure 2

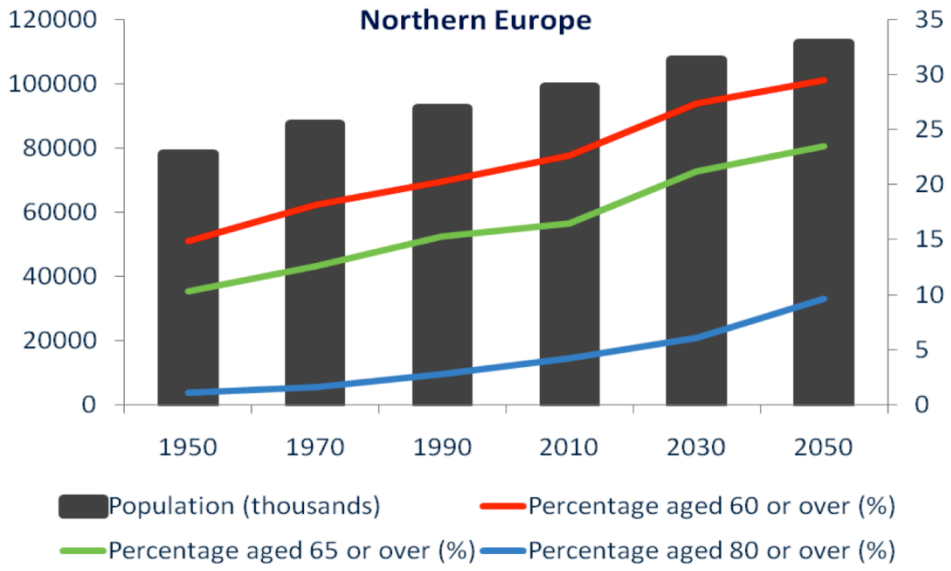


Figure 2: Population Development in Northern Europe (Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden, United Kingdom of Great Britain) 1950-2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Figure 3

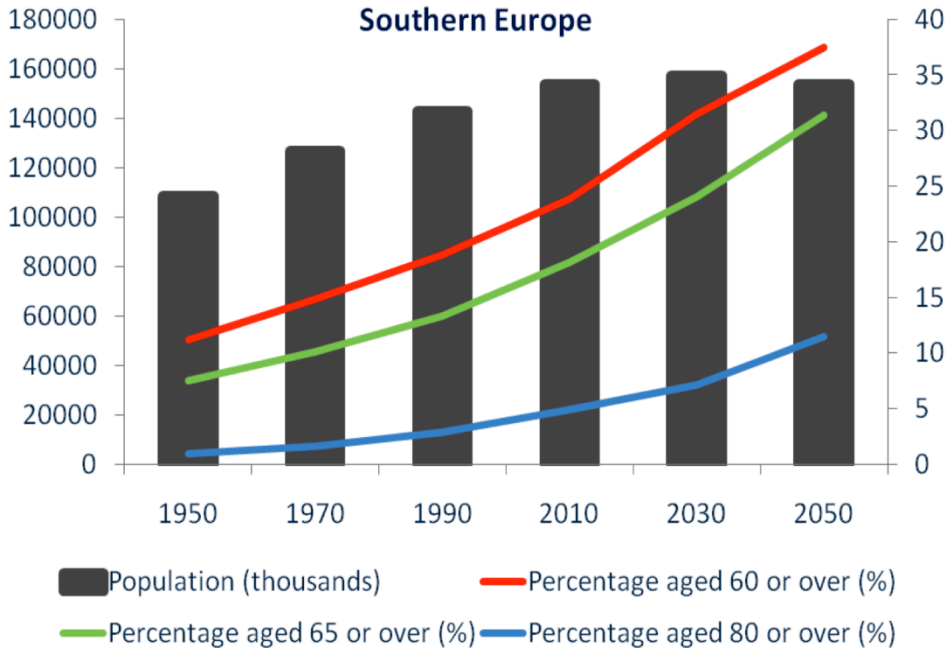


Figure 3: Population Development in Southern Europe (Albania, Andorra, Bosnia and Herzegovina, Croatia, Greece, Italy, Malta, Montenegro, Portugal, San Marino, Serbia, Slovenia, Spain, The former Yugoslav Republic of Macedonia) 1950-2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Figure 4

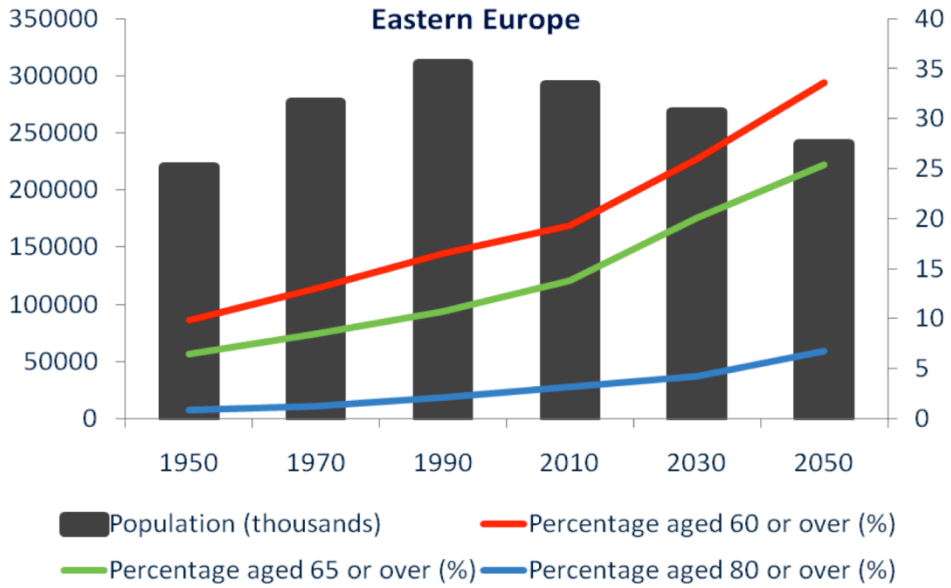


Figure 4: Population Development in Eastern Europe (Belarus, Bulgaria, Czech Republic, Hungary, Poland, Republic of Moldova, Romania, Russian Federation, Slovakia, Ukraine) 1950-2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Figure 5

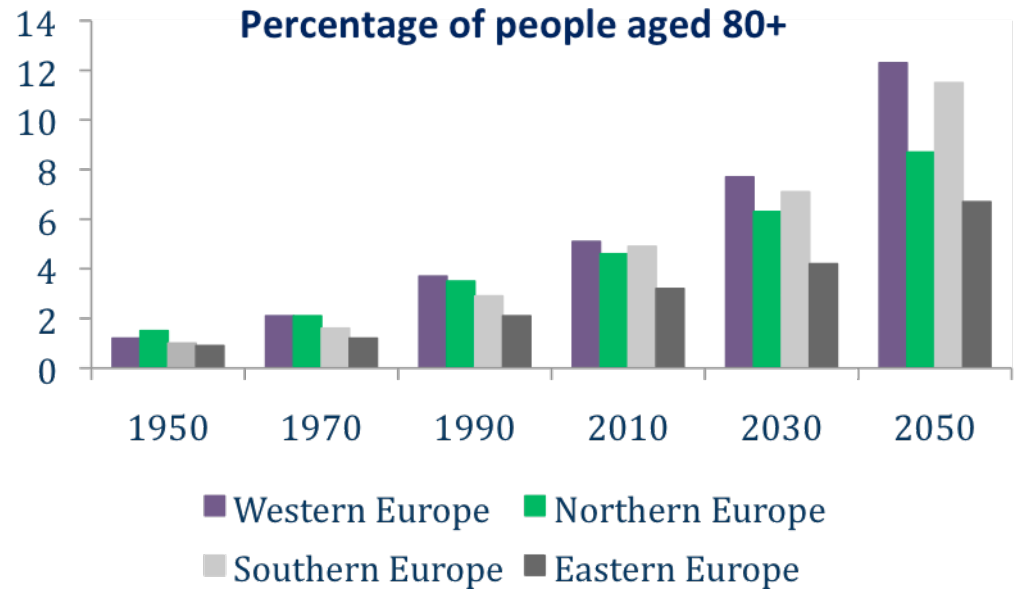


Figure 5: Population Percentage of people aged 80+ in Europe in 1950-2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Figure 6

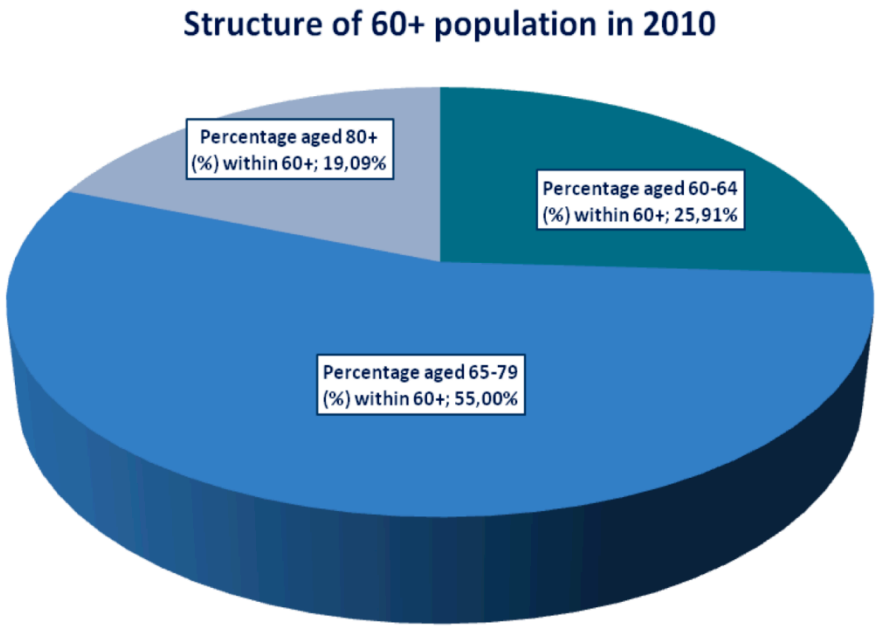


Figure 6: Structure of age group 60+ in Europe in 2010 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Figure 7

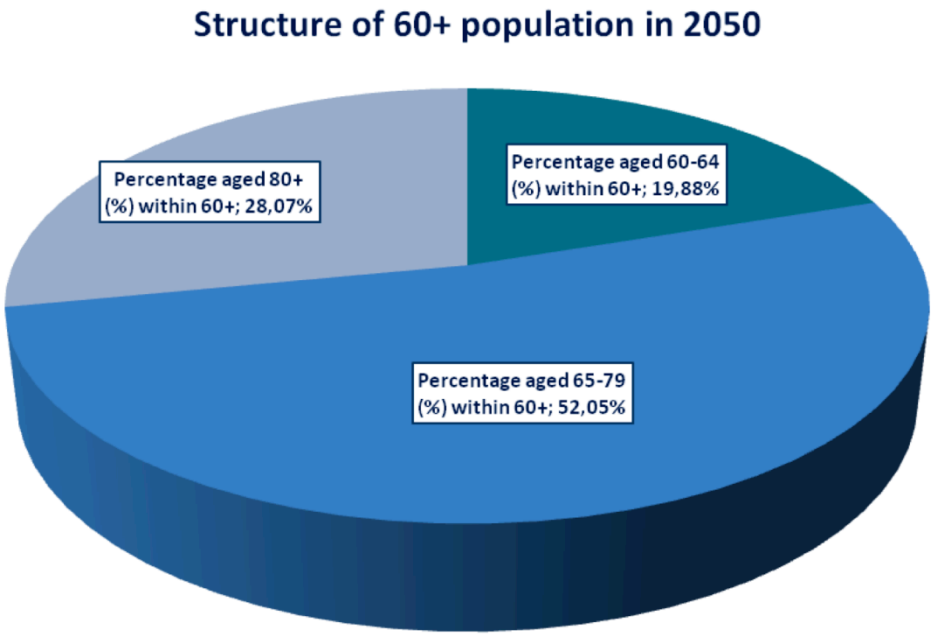
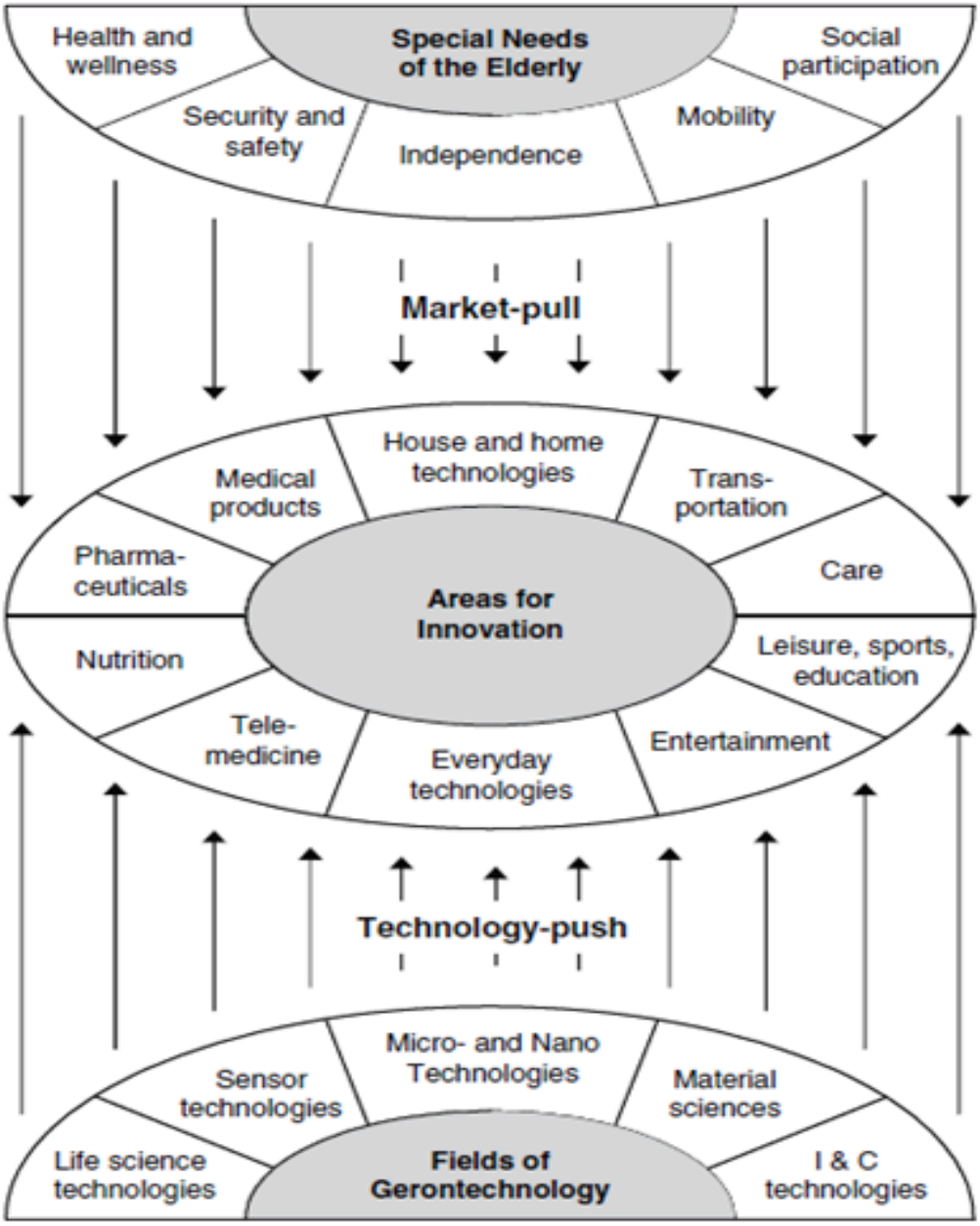


Figure 7: Structure of age group 60+ in Europe in 2050 (Compiled by the author using: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp)

Appendix 2

Attractive areas with a high potential for innovation emerge where markets meet technologies



Appendix 3

Seven Principles of Universal Design

Equitable Use: "The Design is useful and marketable to people with diverse abilities". The design should be attractive to all users and offer the same possibilities in the utilization for every user. If possible, a cookie-cutter use would be best, if not an effective one. Furthermore, privacy, security and safety should be available to any kind of user.

Flexibility in Use: "The design accommodates a wide range of individual preferences and abilities". The design should allow different ways of utilization, both for sinistrals and right handlers. In addition, the accurateness and concision of the user is to be supported, as well as an adaption to the nippiness of the user.

Simple and Intuitive Use: "Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level". In order to afford a simple and intuitive use, needless complexity should be avoided. Readability will be heightening if a broad spectrum of literacy and faculty of speech is supported and if information is branded according to its importance.

Perceptile Information: "The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities". Important information ought to readable at most which could be attained by adequate contrasts between this information and its surrounding. Additionally different modes of presentation (pictorial, verbal, tactile) should be exercised and a compatibility with techniques and equipment which are use by people with restricted sensory, provided.

Tolerance for Error: "The design minimizes hazards and the adverse consequences of accidental or unintended actions". The elements, which are used most, should be also accessible most. Those, which hold risks, ought to be avoided, or isolated, contain warnings for the user. If there are actions, which require alertness, no unknowingly activities should be boosted.

Low Physical Effort: "The design can be used efficiently, comfortably, and with a minimum of fatigue". The retention of the natural bearing, the avoidance of constant corporal stress and a minimization of repetitive actions are worthwhile.

Size and Space for Approach and Use: "Appropriate Size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility". Whether standing or sitting, there should be a clear view on important elements and a comfortable accessibility to all components. Therefore different hand dimensions and grip sizes have to be considered.

Appendix 4

Example: Packaging of Pharmaceuticals

1.Recommendations for Secondary Packaging

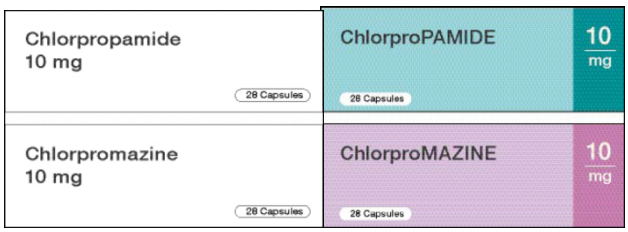


Figure 8: Difference between look-alike medicine names
Source: The Helen Hemlyn Research Centre and National Patient Safety Agency (2007)

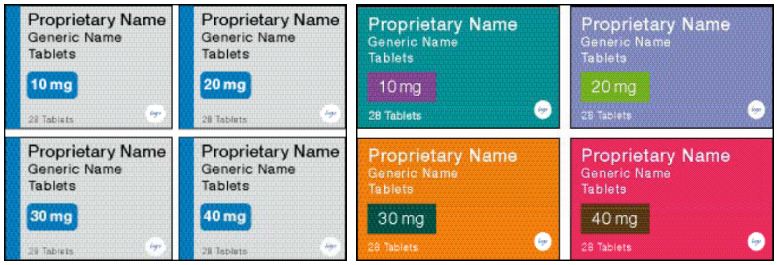


Figure 9: Difference between different strengths of one medicine
Source: The Helen Hemlyn Research Centre and National Patient Safety Agency (2007)

2. Recommendations for Primary Packaging

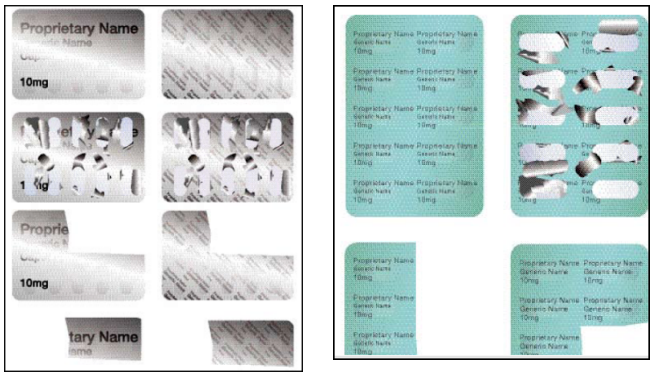


Figure 10: Medicine name on each pocket, no reflective foil
Source: The Helen Hemlyn Research Centre and National Patient Safety Agency (2007)

Figure 11: Matching styles of primary and secondary packaging
Source: The Helen Hemlyn Research Centre and National Patient Safety Agency (2007)

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Universität St.Gallen

Hochschule für Wirtschafts-, Rechts- und Sozialwissenschaften

(HSG)

Megatrend “Global Demographic Change”: Tackling Business and Society Challenges in 2030 and beyond

Topic 4

Switzerland 2030-2050. Prepare a scenario of the population size and composition.

Authors

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November 2009

St. Gallen University

Megatrend “Global Demographic Change”

Dr. Hans Groth

Contents

1 Introduction

Switzerland, situated in the centre of Europe is and was always dependent on other countries, mainly because of its lack of natural resources. In recent years, a different shortage occurred in most of the highly developed western countries: a shortage of labour force, because of an aging domestic population and not enough replenishment due to the shrinking birth rate. However, the Swiss characteristics provide the reason for filling this gap with the attraction for ordinary workers, as well as brainpower from abroad. The mentioned characteristics reveal themselves in an efficient health care system and as a result of this one of the highest life expectancies throughout Europe and, furthermore, in an established school and social system. This fact led to a strong and sustainable economic growth and also to huge demographic changes (Groth, 2009, p. 4).

Behind these perceptions lies the motivation of the assignment. We want to detect the main changes of the society we live in. The awareness of these changes gives us the opportunity to adapt at a stage in time when it is not already too late, i.e. it provides us with a certain flexibility and arising from this - certainty. Furthermore, we will not only be affected personally or among our family or circle of friends, it will also be related to our professional life, i.e. job security, new business ideas. Many other challenges and opportunities will also emerge. To be prepared for this is of significant importance.

With this thesis, we will try to analyze the population size and its composition by playing through three scenarios. The aid of hypotheses applied to different issues leads to a deeper understanding of the sets of problems Switzerland is faced with. These hypotheses assume positive, unchanged and negative impacts on the Swiss population and economy. In the following, we aim to identify those factors to maintain a growing and competitive economy in Switzerland. We focus on important aspects such as immigration/emigration, the employment quota and health care. In addition, supporting drivers of a growing and competitive economy will be revealed as well as typical Swiss conditions, which could accomplish the objective better or worse than other nations. At the end, we combine all the findings and point out the core trends in this specific field.

2 Simulation

This part of the paper considers the impact of education, profession, migration and health care on the development of the population size as well as the demographic composition of Switzerland until the year 2050. The factors with the greatest impact on the development of the population were chosen for closer analysis. In order to better simulate the influence of these main parameters, three hypotheses or scenarios were developed for each: i.e. a middle, high and a low scenario. The data for the simulations and their results were retrieved from the "Bundesamt für Statistik" (Swiss Federal Statistical Office).

2.1 The impacts of family policy and education on the population size and labour force

In order to simulate the development of education levels and their consequences for the population, we firstly have to consider three scenarios: a middle scenario "A", a high scenario "B" and, lastly, a low scenario "C".

The middle and low scenarios assume the status quo in the area of education. This means that the number of adolescents, who start an apprenticeship, attend a gymnasium (grammar school) or begin their education at a university or a university of applied sciences, remains stable. At the same time, the scenarios assume that the number of people, who get a non-university tertiary graduation or complete only secondary level I, will decrease.

The high scenario assumes that the number of adolescents, who start at a gymnasium, a professional baccalaureat or an education at a university respectively, will increase and, at the same time, the number of people who only finish secondary level I will decline. According to Figure 1, the greatest number of changes will occur among women. Considering the A- and C-scenarios, the majority of women will get a diploma in secondary level II (55 percent) and the rate of women with a tertiary education will more than double (39 percent). According to scenario B, 48 percent of all women tend to finish secondary level II and 47 percent will get a tertiary education (Bundesamt für Statistik, 2006, p. 44-46).

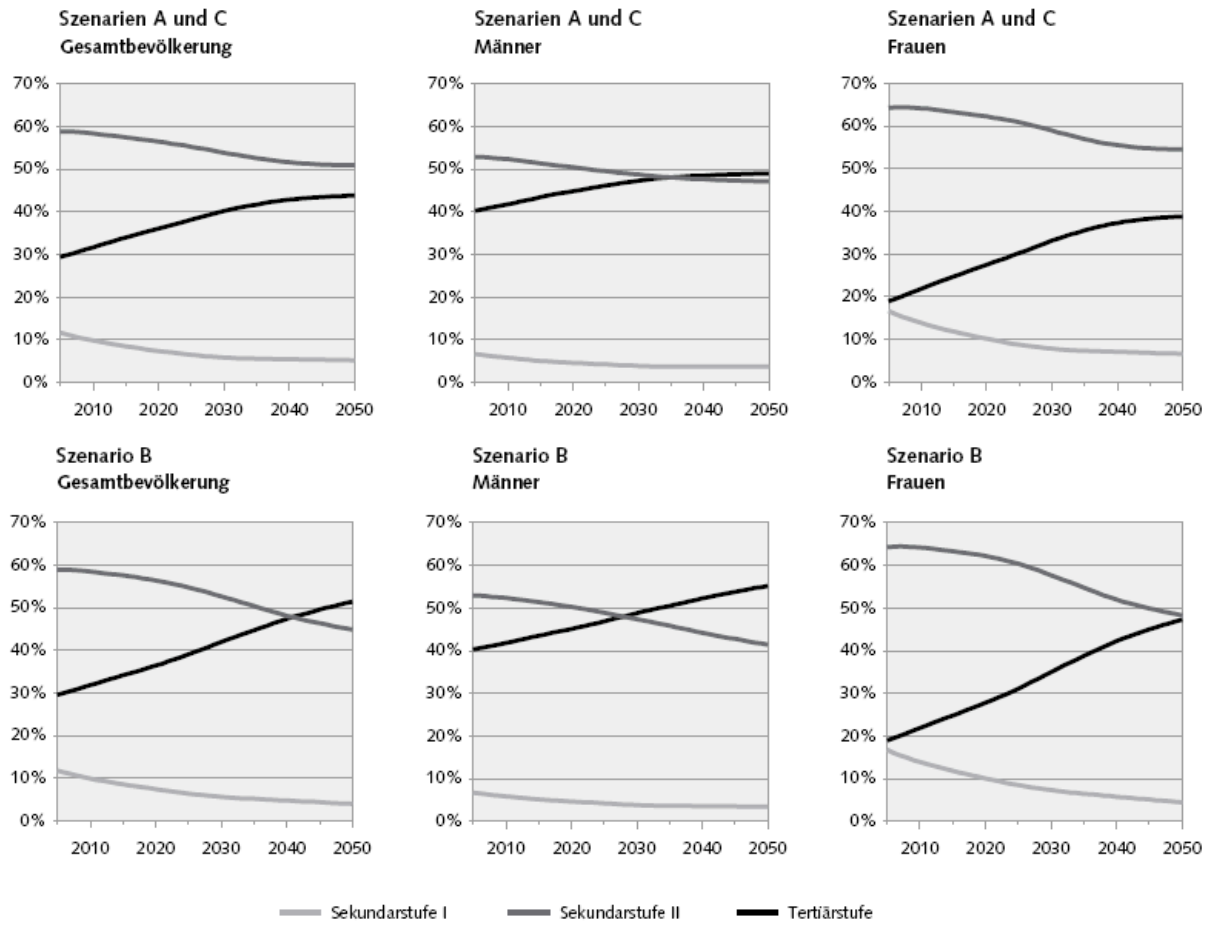

Figure 1: Development of educational level of Swiss population at the age of 25-62 (W) / 64(M) years according to three scenarios, 2005-2050 (Source: Bundesamt für Statistik, p. 47-48)

In the following, we will consider the changes in the labour market. The demographic development will have a big influence on the labour force during the forthcoming years. As a result of the ageing of the population, the growth of the labour force will be lower than the population growth regardless of the chosen scenarios. According to the middle scenario A (see Figure 2), despite the ageing population and the decreasing labour participation, the labour force will increase until the year 2018 and will reach a total of 4.463 million people. Afterwards, the size of the labour force will decrease again and finally reach the number for the year 2004, i.e. 4.137 million people.

While the male labour force is mainly responsible for the decrease, the female labour force will slightly increase until the year 2050. The biggest differences can be recorded between the Swiss and the foreign labour force. While the Swiss labour force already begins to decrease after the year 2018, the foreign labour force will continue to increase until the year 2023 and only from then will it start to decrease. For the whole period lasting until the year 2050, the number of foreigners in the labour force will increase.

According to scenario B, the labour force constantly increases and reaches 4.978 million people in 2050. However, the foreign labour force only increases until 2030 and begins to decline afterwards. This scenario shows that the number of men in the labour force will increase at a much slower pace than the number of women.

Scenario C illustrates that the total labour force will decrease starting from the year 2012 and will reach only 3.311 million people in 2050. Compared to the foreign labour force, the Swiss labour force will decrease much more. The explanations for this development are that on one hand, the birth rate in Switzerland will decline and on the other hand, Swiss people often tend to retire quite early. In addition to this, the male labour force will once again decline more than the female labour force (see Figure 2) (Bundesamt für Statistik, 2006, p. 57).

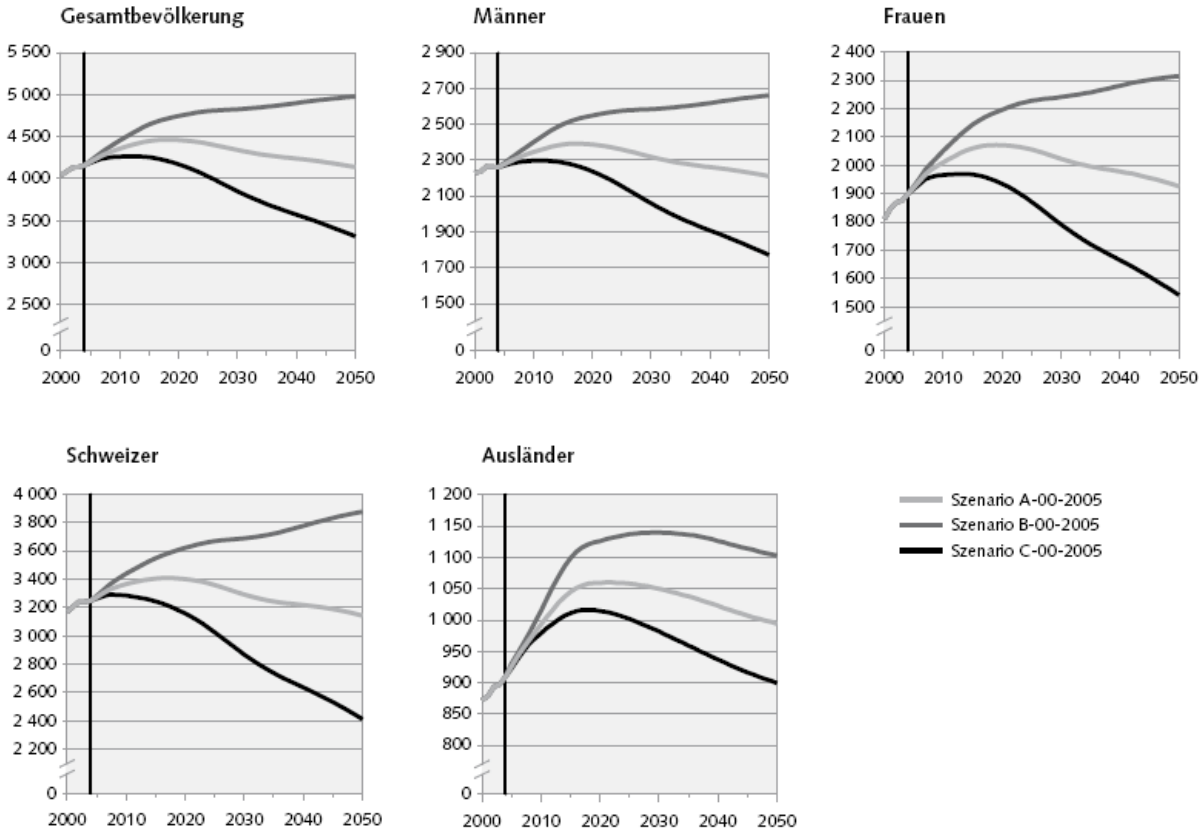

Figure 2: Labour force separated in nationality and gender according to three scenarios, in thousand, 2000-2050 (Source: Bundesamt für Statistik, 2006, p. 58)

According to the assumptions made previously, considerable changes in educational and professional development patterns of women can be recorded. Nowadays, women have significantly more possibilities to achieve a good education and also to participate in the labour market. Therefore, they tend to invest more time in their education and their professional development and consequently if at all, they usually plan to have children much later. This automatically implies that the fertility rate will shrink. In contrast to the family policies in Sweden, Norway or France, in Switzerland no such

policy for balancing the professional and the family life has so far evolved. As a result, the fertility rate is expected to shrink further in the future. In order to prove this assumption some appropriate simulations have to be developed.

In order to simulate the impact of the educational and professional engagement of women on the development of the population, let us initially define what a consolidated birth-rate means. "A consolidated birth-rate stands for how many children a woman can theoretically have, if during her whole reproductive phase (age between 15 and 49 years) the observed age specific birth-rates do not change" (Demos, 2009, p. 6). So we have to consider that the consolidated birth rate provides a realistic estimation, if the age specific birth rates or an average age of women having a child stay constant in the long run. Consequently, regarding the postponement of childbirth to a later point in time, the consolidated birth rate of women is usually underestimated. So the consolidated birth rate is lower than the realistic average number of children a woman in an age capable of bearing children will have during her life (Demos, 2009, p. 6).

In order to design a simulation, which calculates the average rate of children per woman and the average age of a woman having a child, we have to consider three hypotheses based on several assumptions.

- Middle hypothesis:
    - The development of the family policy occurs slowly and children and families gain importance in Switzerland.
    - The further deployment of nursery schools and places, where children can be looked after, enables parents to invest more time in their education and profession.

According to the middle hypothesis, the consolidated birth rate of Swiss women will decrease from 1.48 to 1.35 children between 2008 and 2050 (see Figure 3). The average age of women having a child will surge slightly from 31.0 to 31.5 years (see Figure 4) (Demos, 2009, p. 6).

- High hypothesis:
    - There is a transformation of the public attitude toward children and family whose importance is widely recognised.
    - The application of an effective and coordinated family policy in Switzerland.
    - A better balance between family and profession is possible due to childcare facilities and flexible working policies (flexible working hours, working from home).

These changes result in a slight increase of the fertility rate. The consolidated birth rate of Swiss women will therefore increase to 1.6 in the year 2050. The average age of women having a child will additionally decrease to 30.5 years.

- Low hypothesis:
  - The status quo in family and gender policy. Children and family belong to a private sector and not to a public one.
  - Women are becoming more independent due to increased possibilities to acquire a reasonable job. At the same time, the competition between profession and family is getting stronger.
  - The rate of childless women surges.

It is straightforward, when taking in to account these assumptions, to conclude that the fertility rate will shrink. The consolidated birth rate among Swiss women decreases to 1.1 in 2050 and the average age of having a child increases to 32.5 years.

- Hypothesis “renewal of the generations”:
  - Starting from the year 2020, the consolidated birth rate in Switzerland will increase and stabilise at 2.1. This is the average number of children per woman, which is required for the population to remain stable. The average age of women having a child decreases to 30.0 years and stabilises at this level after the year 2020 (Bundesamt für Statistik, 2006, p. 16-17).

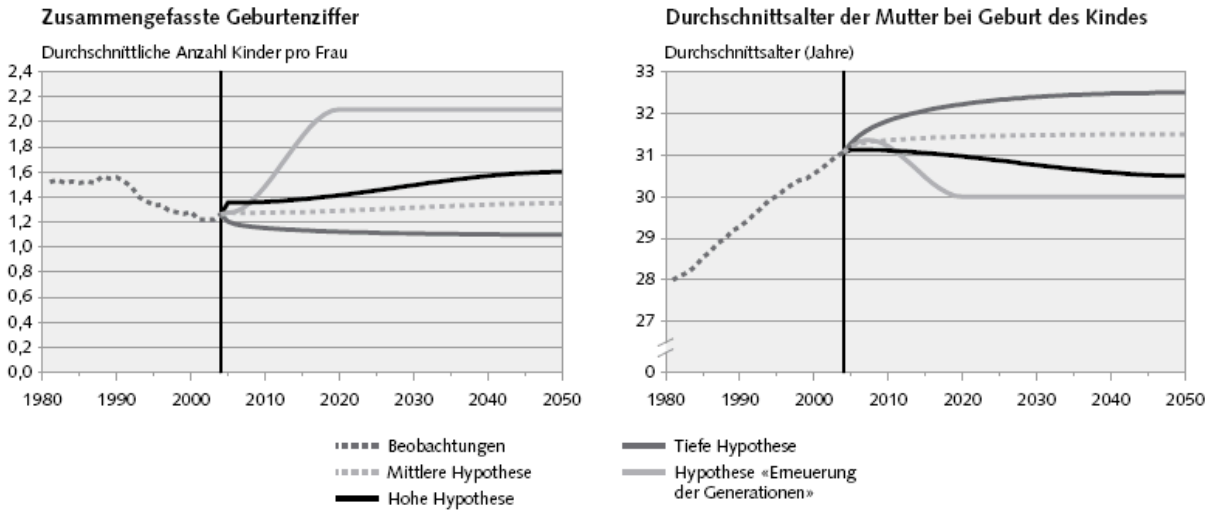

Figure 3: Development of an average rate of children and an average age of having a child of Swiss women according to three hypotheses and the hypothesis “Revival in population” (Source: Bundesamt für Statistik, 2006, p. 17)

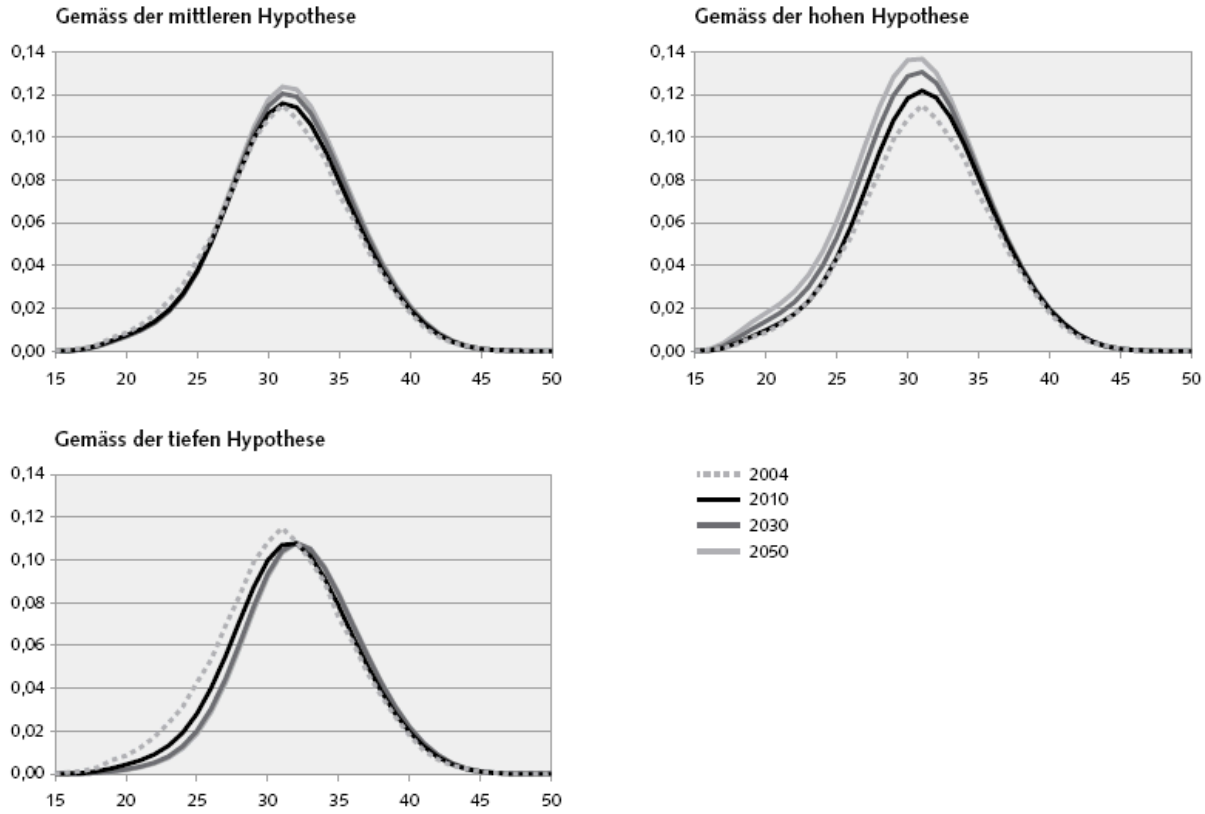

Figure 4: Age-specific birth rates of Swiss women in 2004, 2010, 2030 and 2050 (Source: Bundesamt für Statistik, 2006, p. 18)

In order to receive a more reliable result from the simulation, the consequences of the economic crisis have to be considered as well. It is quite challenging to predict the impacts the crisis will have on the educational level of the Swiss population or trends in the labour market. The possible assumptions about the future developments depend on the question as to how deeply the country is affected by the financial crisis and for how long the crisis will last. Negative impacts on the labour market are possible aftermaths of the financial crisis; redundancies can have a negative influence on the financial stability of a family. Therefore, families tend not to ask *if* they want to have a child, but rather whether or not they can *afford* to have a child. The additional pressure on a woman to find a job in order to be financially secure also has a vast impact on the decision to have a child or not. As a consequence this leads to a further decline of the population.

2.2 Health care quality and its impact on the population

The development of the mortality rate in older age groups depends strongly on the lifestyle, the genetic predisposition and the availability of an efficient health care system for all groups of people (Groth, 2009, p. 11). Groth (2009, p. 12) writes: “The three highest causes of death among the Swiss

population are cardiovascular diseases (37 percent), cancer (26 percent) and for the first time since 2007 – dementia". In addition to overweight and obesity there are other diseases from which not only elderly people suffer, but also adolescents.

In order to run a simulation for analysing the life expectancy of the Swiss population, the previously discussed factors need to be integrated into the following three hypotheses:

- Hypothesis of a middle life expectancy at birth:
  - A relatively effective prevention of accidents, suicide and degenerative diseases.
  - No occurrence of new epidemics and diseases.
  - No fundamental medical improvements.
  - No restrictions on using health care.

At the beginning, medical improvements in areas such as cardiovascular diseases or cancer will enable an increase in life expectancy at first according to the actual trends and later with a regular levelling tendency. In 2050, the life expectancy for men is expected to be 85.0 years and for women approximately 89.5 years. At the age of 65, men will have an average of 22.5 years and women an average of 25.5 years to live (see Figure 5).

- Hypothesis of a high life expectancy at birth:
  - Successful prevention of mortality in society: effective actions against accidents and suicide and early diagnosis of various diseases.
  - Essential medical developments, which enable people to suffer less from AIDS and cancer and, in addition, the appearance of degenerative diseases can be postponed.
  - Extensive availability of health care structures.

Not only important steps in the direction of cancer treatment and the treatment of cardiovascular diseases, but also a change in lifestyle by avoiding harmful behaviour leads to a substantial increase in life expectancy during the forthcoming years. However, this growth will subsequently even out. In 2050, the life expectancy is estimated to increase to 87.5 years for men and 91.5 years for women. At the age of 65 years men will on average have 24.5 more years to live and women around 27.0 years.

- Hypothesis of a low life expectancy at birth:
  - Slow-going improvements in the fight against mortality.

- Occurrence of new epidemics and early combated diseases such as tuberculosis, occurrence of new diseases due to unhealthy life styles (overweight) and environmental damage.
- Certain drugs will lose their effectiveness against infectious diseases.
- Limited health care availability due to bad financial situation.

An increase in harmful lifestyles due to smoking, excessive alcohol consumption or overweight will, without the appropriate medical developments, stop the current increase in life expectancy. Therefore, the increase in life expectancy will slow down during the next years. In the year 2050, the average life expectancy will be 82.5 years for men and 87.5 years for women. At the age of 65 years men will on average still have 20.5 years to live and women about 24.0 years (Bundesamt für Statistik, 2006, p. 20-21).

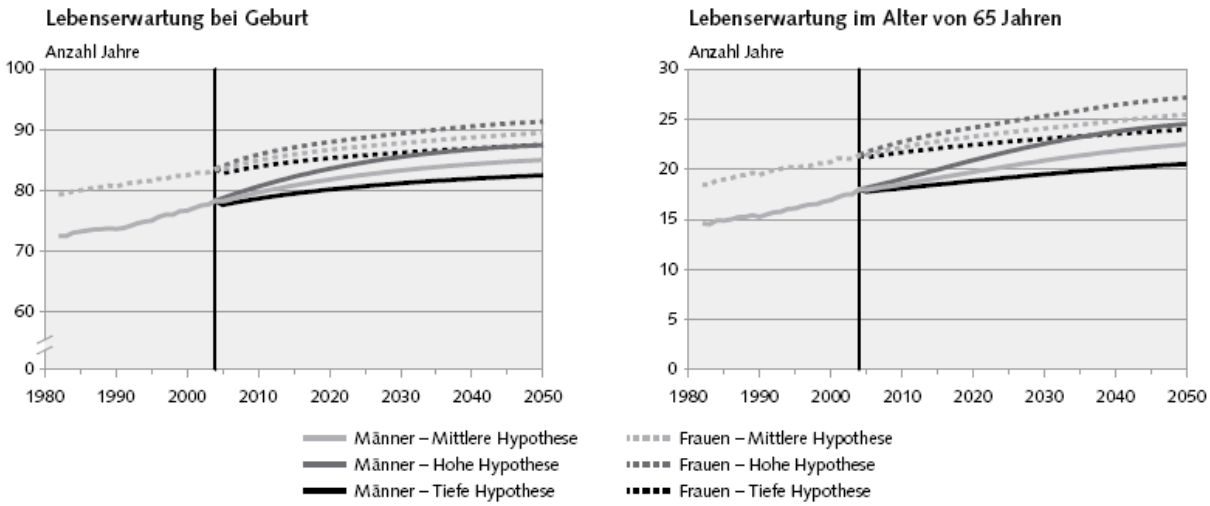

Figure 5: Development of life expectancy of Swiss men and women according to three hypotheses, 1982-2050 (Source: Bundesamt für Statistik, 2006, p. 21-22)

According to the results of the simulations, the size of the older age group will continuously and inevitably increase. This development bears many challenges, which will be discussed in the next section of the paper.

2.3 Migration and its impact on the population

In the last years, the population of Switzerland has grown by roughly 1% annually. The main reasons for this increase were population gains from immigration, which were above the average compared to the rest of Europe (Groth, 2009, p. 2).

For the simulation of the impacts of migration on the Swiss population there are three hypotheses, which have to be observed:

- Hypothesis of a middle immigration rate:
  - The actual trend will continue: the free movement of people has only a temporary effect on the immigration of citizens from new EU member states.
  - Citizens from Non-Economic-European-Area (EEA) member states may migrate to Switzerland only if they can prove that they have good qualifications and skills.

The migration difference between immigration and emigration from EEA member states will stay constant in the coming years. Starting from 2012, net-migration will decrease and stabilise in 2020 at an average of plus 10,000 people. The migration difference of people from Non-EEA members also tends to plus 10,000 people and will stabilise at this level from 2020 onward. However, the migration difference of Swiss nationals will record a loss of 5,000 people (see Figure 6).

- Hypothesis of a high immigration rate:
  - Due to the high attractiveness of Switzerland as an economic place more citizens from EEA states decide to work and stay in Switzerland.
  - Resulting from a decrease in Switzerland's labour force the boundaries of the Swiss labour market are open for citizens from Non-Economic-European-Area (EEA) member states.
  - Because of the high attractiveness of Switzerland as an economic place and a decrease in its labour force, Swiss people are not interested in emigrating to other countries and those who have already emigrated return.

The migration difference of citizens from EEA member states will slightly increase until the year 2011; afterwards it will decrease and stabilise at plus 15,000 people in 2020. The migration difference of people from Non-EEA member states also tends to plus 15,000 and will stabilise at this level starting from 2020. The migration difference of Swiss nationals will tend to zero.

- Hypothesis of a low immigration rate:
  - Decrease in the socioeconomic attractiveness of Switzerland and consequently a decline of immigration from citizens of EEA and Non-EEA member states.
  - Shrinking of the socioeconomic level causes more Swiss nationals to leave Switzerland and look for employment in another country.

The migration difference of people from EEA member states begins to decrease immediately and stabilises at a level of plus 5,000 people in 2020. The migration difference of Non-EEA member states will also tend to plus 5,000 people and will remain at this level after the year 2020. The emigration of Swiss nationals will reach minus 10,000 in the year 2050 (Bundesamt für Statistik, 2006, p. 24).

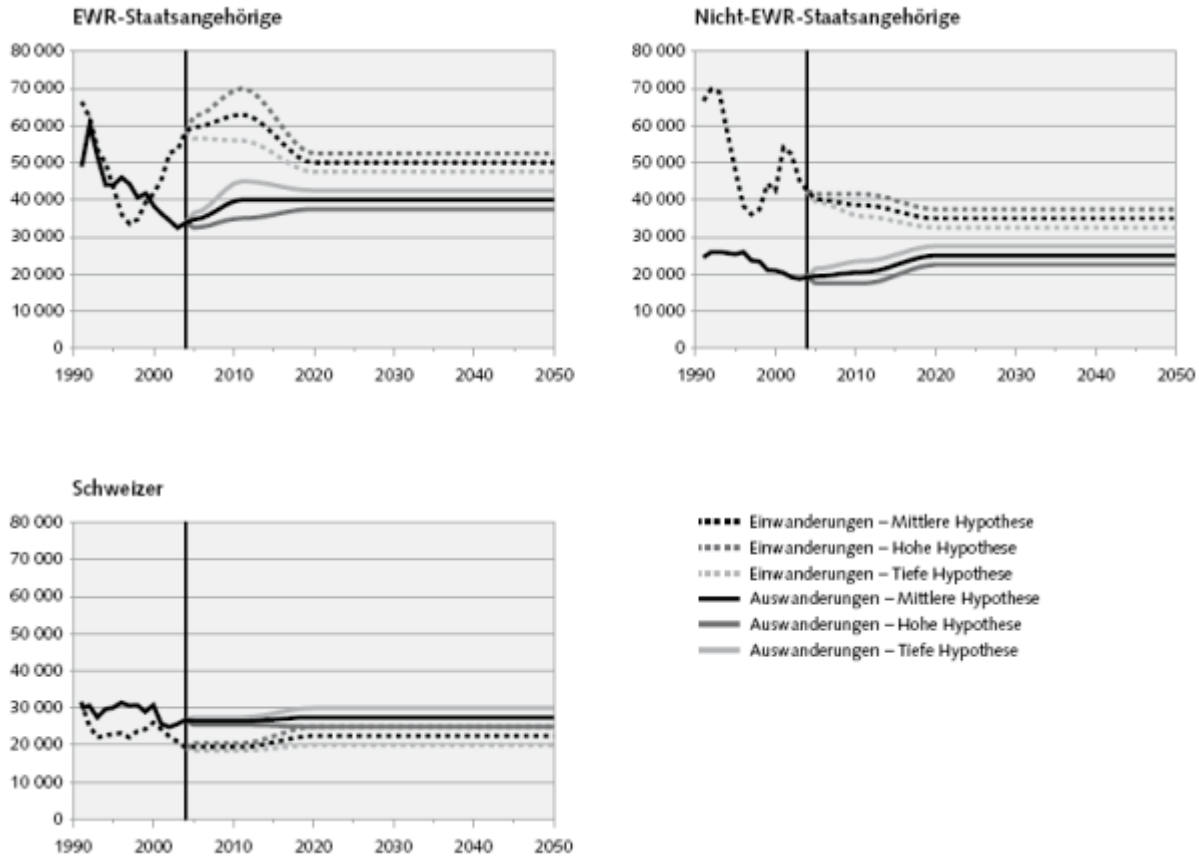

Figure 6: Number of immigrants and emigrants according to three hypotheses, 1991-2050 (Source: Bundesamt für Statistik, 2006, p. 25)

2.4 Results

Taking into account the previous scenarios regarding the influences of health care and migration on population growth, as well as the effects of education and labour participation on the fertility rate, it is possible to analyse the aggregated impact on the future demographic constellation. As carried out previously, we again distinguish between middle, high and low scenarios.

According to the middle scenario the population of Switzerland will rise until 2036 and increase from

a population of 7,701,856 to 8,162,000 (Statistik des jährlichen Bevölkerungsstandes (ESPOP), 2008). Afterwards, the fertility deficit will exceed the positive migration rate and, as a consequence, the population will shrink. In 2050, the population will be at a level of about 8,061,000 people.

In terms of the high scenario, which assumes that fertility, life expectancy and the migration rate will be slightly higher, the population will increase continuously until the year 2050. In 2050, the population will then be equal to 9,659,000 people.

In contrast to the high scenario, the low scenario assumes a decrease in the fertility rate, a low increase in life expectancy and a migration rate that is equal to zero. In this regard, the population will decrease to 6,529,000 people in 2050 (see Figure 7) (Bundesamt für Statistik, 2006, p. 31-32).

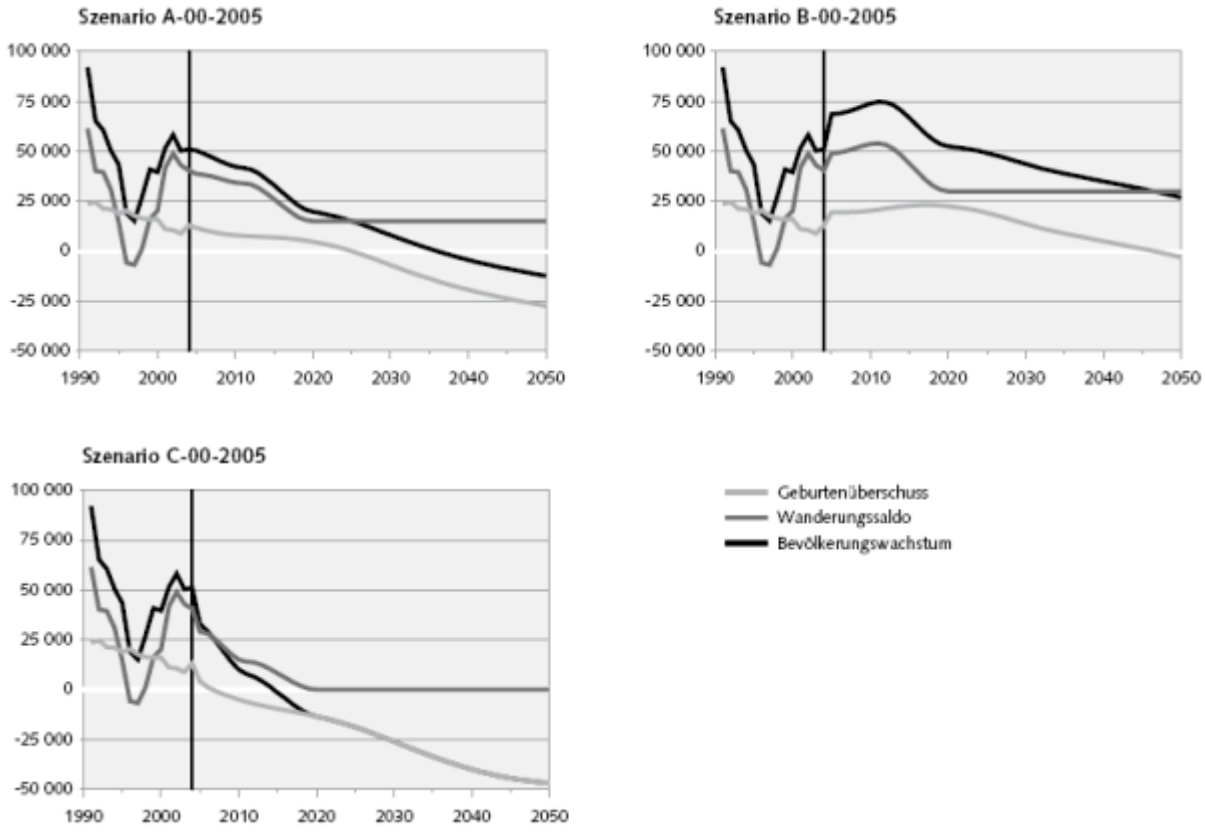

Figure 7: Birth surplus, migration balance and population growth according to three scenarios, 1991-2050 (Source: Bundesamt für Statistik, 2006, p. 33)

People who are between the age of 40 and 50 years in 2010 belong to the age group of the so-called "baby boomers", the generation, which had the highest birth rate so far. Starting in 2025, they will begin to retire and consequently the number of retired people will increase steeply until the year 2035 (Bundesamt für Statistik, 2006, p. 35).

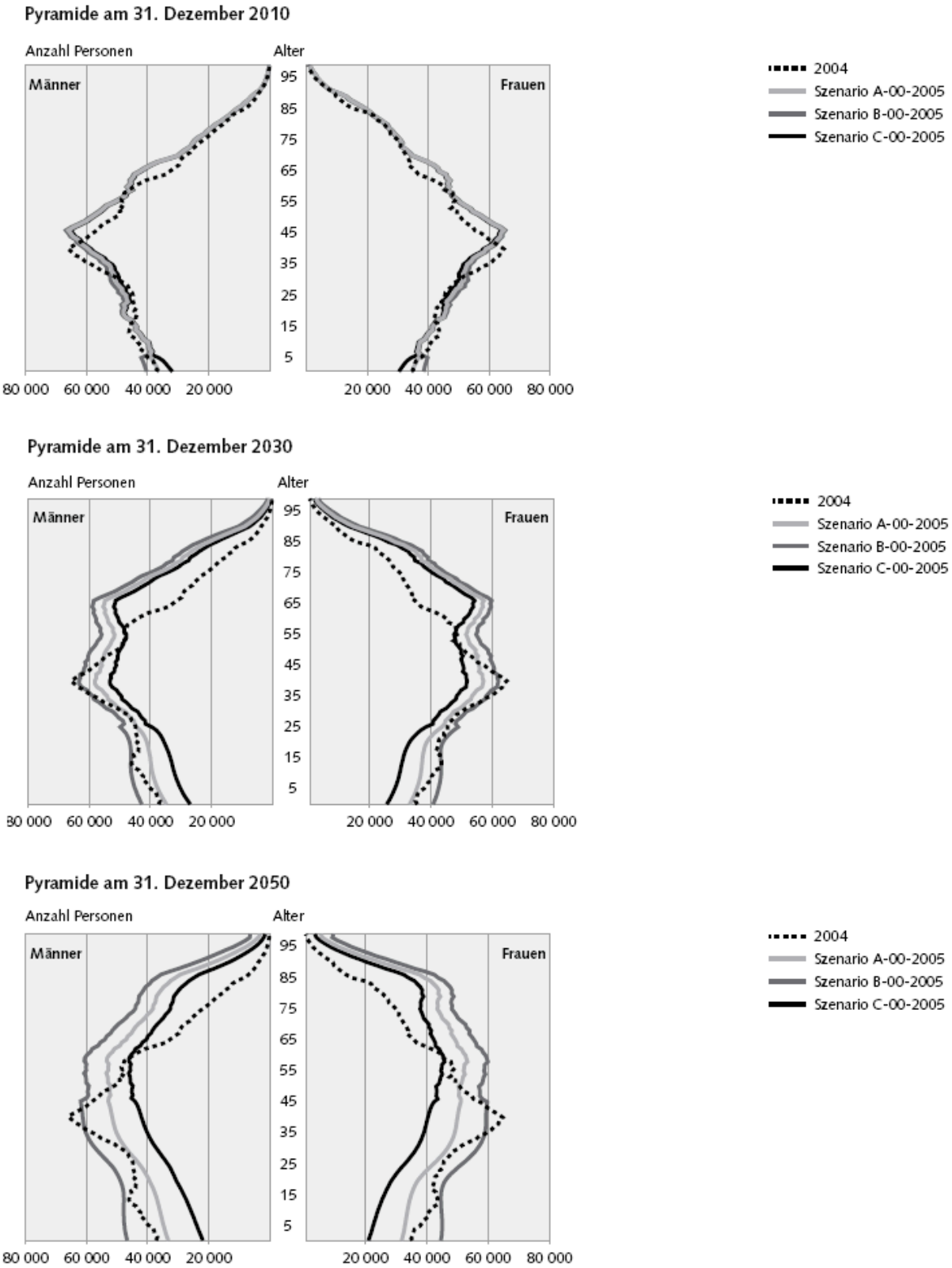

Figure 8: Age pyramid of the population according to three scenarios, 2010, 2030 and 2050 (Source: Bundesamt Bundesamt für Statistik, 2006, p. 36)

3 Determinants of a growing and competitive Swiss economy

In the previous chapter, we analysed how Switzerland's demographic situation would look like between 2030 and 2050. We performed this analysis on the basis of the following factors, namely the migration, family policy and labour participation as well as the healthcare system. Our analysis shows that during the period 2030 to 2050, Switzerland will face several challenges in order to be able to maintain a growing and competitive economy.

In this chapter we further analyse each of the three factors in order to determine the strategies to tackle developing problems and how to turn them into opportunities.

3.1 Labour participation and family policy

How to maintain a growing and competitive economy?

"Never in history have older Europeans been so healthy, yet never, in all likelihood, have they worked so little" (Eberstadt and Groth, 2007, p. 50). This is a fact, which is apparent across Europe and also in Switzerland. Even though more and more people between the age of 55 and 64 are working, Switzerland's average effective age of retirement is still at 63.5 years. The reasons for this discrepancy between the legal age of retirement of 65 years and the effective age are either based on health reasons, personal issues or offers from employers for an early retirement (Groth, 2009, p. 18). In order for Switzerland to maintain a growing and competitive economy this is an essential starting point, especially in relation to an aging population and rising pension costs. Additionally, the number of people in employment compared to the total population is forecasted to decrease substantially in the future. The Bundesamt für Statistik (2009c) predicts that the gross-employment-quota in the year 2050 will be around 51.3 percent of the total population. This is a decrease of 6.1 percentage points compared to the year 2008. This decrease would lead to an enormous burden on the employed population as the number of people above the age of 64 would increase to 59.4 per 100 people in the age range of 20 to 64 years (age quotient). This means that less than two persons in an employment age would need to care for one retired person (Groth, 2009, p. 10; Bundesamt für Statistik, 2009c). Economically this is also unfavourable, as the productivity would decrease accordingly.

In order to change this development in favour of a growing economy, there are two main approaches to examine. On one hand the problem could be tackled from the top regarding the "old" (people

above the age of 64) and on the other hand from the bottom by increasing the fertility rate and taking respective actions in family policies and education.

Regarding the issue of early retirement, there are several options. The most obvious option would be to enforce the legal retirement age. The issue is, that this action "is not only dependent on the employability of employees, but also on the declared will of employers to keep older employees in their jobs" (Groth, 2009, p. 19). But even when the retirement age becomes effective, it would not essentially diminish the burden on the working population. Therefore, it would be necessary to further increase the legal retirement age, which – regarding the predicted life expectancy for women (89.5 years) and men (85 years) for the year 2050 (Bundesamt für Statistik, 2009b) – should be a reasonable step, but probably would not make it through a public vote.

A softer measure would for example be to create some sort of incentives either for employers to keep older people employed for a longer period or for employees to voluntarily keep working beyond the age of retirement. Incentives in this regard could for example include tax reductions for employees beyond the retirement age or provide a flexible pension system offering the possibility of part-time employment with a partial pension payment. For companies and the whole economy this measure could have various positive effects. On one side a highly experienced workforce including a considerable know-how could be kept in the labour market and on the other side the size of the labour pool would substantially increase. The effect of an increase in the labour pool is shown in a European scenario provided by Eberstadt and Groth (2007, p. 56) who say that "an expansion of the European labour pool by 20 percent or more between now and 2030 […] could have a tremendous impact on the pace of economic growth in the region over the coming generation". This same effect would also be the case for Switzerland.

The second approach to tackle the problem of the shrinking labour force would be, as previously mentioned, to increase the fertility rate in Switzerland. This is a target, which can only be achieved, in the very long run by changing ideologies and public thinking. Regarding this topic, we can learn either from France or Sweden, as since the 1970s, they have a higher number of newborns than Switzerland. This is due to the fact that, "both have, as it were, 'historically' working models and childcare structures, which are more family-friendly" (Groth, 2009, p. 9). In this sense, it would be necessary for Switzerland to improve and increase the number of childcare facilities. It is essential that childcare already begin in the first year of life of a newborn in order to get the best results. Only when childcare is implemented, will it be possible for the parents not to spend too much time away from their job (Hossmann et. al, 2008, p. 28). Hence, this measure would make it much easier for

Swiss women to combine work with family and would therefore provide a favourable foundation to increase the fertility rate. An additional advantage of an increased number of achievable childcare facilities is that even mothers who were not previously working could try to participate in the labour force again and could provide additional productivity for the economy. It is essential hereby that these childcare facilities are created on a private basis as it would otherwise lead to additional public costs which should be avoided in order to maintain a competitive economy.

What are the drivers of success?

Three main drivers for a successful economic development in Switzerland in the context of a shrinking employment quota can be derived from our previous analysis. The first and most important driver would be the activation of the experienced workforce from the ages of 55 to 65 or higher. This can either be achieved by realizing the legal retirement age of 65 or by motivating the same target group to remain in employment by creating specific incentives. The second driver is to maintain or increase the quality of the present labour pool through life-long education and training. This action automatically results in an augmented productivity and growth of the economy. The last driver of success is to enhance the labour pool and at the same time to reduce the aging of the population by increasing the fertility rate. As already discussed above, this can be achieved through improving and further developing existing childcare facilities as well as providing new ones.

If these three measures can be implemented there is good chance that the future development of the Swiss economy can be positively influenced.

Are there typically Swiss prerequisites to tackle this in a better or worse manner than other nations?

Switzerland is in quite a favourable position regarding the future challenges. With an average employment quota of 80 percent in 2008, Switzerland, after Iceland, reached the second highest quota in Europe (Groth, 2009, p. 17). This shows that Switzerland has a very active and also productive society. In addition Switzerland has, compared to its neighbouring countries, a relatively low age quotient and also a somewhat higher number of people between the ages of 55 and 64 participating in the active labour force. Regarding this topic, Switzerland may have some sort of a head start compared to its neighbours, but there are some major changes necessary in order to profit from this. Especially in terms of lacking childcare facilities there is a lot of work to be done in order to be able to tackle the aging of the population in an efficient way and to keep up with some of the other European countries.

3.2 Healthcare System

How to maintain a growing and competitive economy?

The most important aspect to maintain a high quality healthcare system is to invest primarily into research. Even though the present costs for this investment appear very high, the long-term benefits could easily redeem the initial expenditure. The intention behind this is to create a high healthy life expectancy, which not only means that people live longer but that they can do this under much better health conditions.

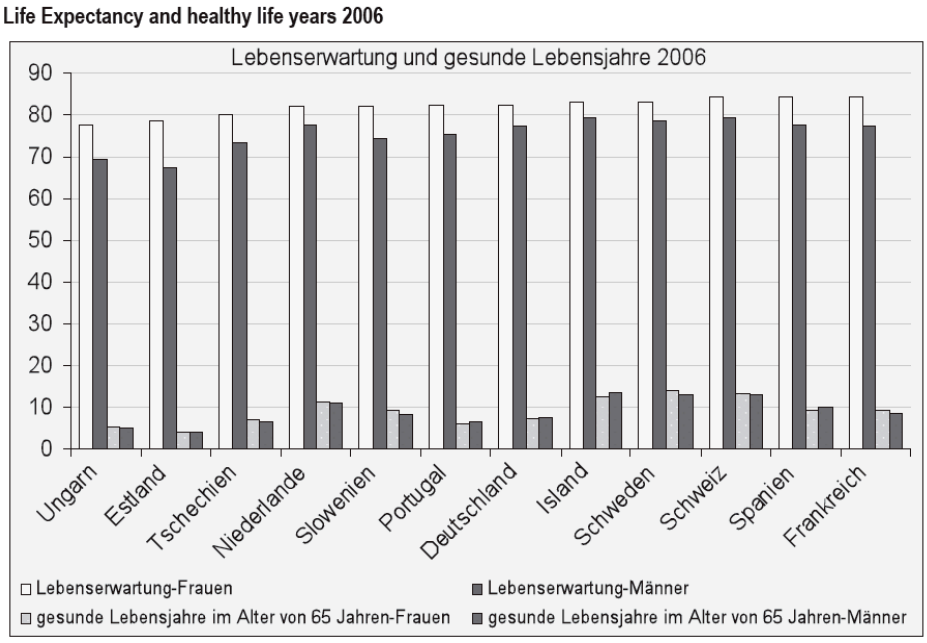

Figure 9: Life expectancy and healthy years in European countries (Source: Groth, 2009, p. 11)

Research should mainly be focused on those diseases, which are causing the highest mortality rate in Switzerland. As referred to before, such cases are, for example, cardiovascular diseases (37 percent), cancer (26 percent) and for the first time also dementia (Groth, 2009, p. 12). These diseases produce an immense damage to the public sector, which could be partly avoided by improved preventive procedures thanks to superior research efforts. Concerning the economic side of this problem, it can be said, that if the elderly tend to live longer with less cardio complaints, they do not need to spend as much money on healthcare as they do today. On the contrary, they will spend at least a certain amount of that money for consumption. To briefly retry to broaden the whole image, older people should not be segregated from the active working population but reintegrated in order to pass their accumulated knowledge down to younger social classes and to keep them as consumers to maintain economic prosperity (Eberhardt-Groth, 2009, p. 56-57).

What are the drivers of success?

The most important driver is, as already mentioned, to conserve a high healthy life expectancy with the support of a well functioning health care system and sufficient allocated resources for research activities. These aspects are also interesting for companies, which consider entering the Swiss marketplace or that even want to transfer their headquarters to Switzerland. Two major advantages are obvious; on one hand healthier employees generate less absenteeism, are more motivated and in the end are likely to be more productive. On the other hand, good health care allows individuals to work longer, thus companies are faced with less restructuring costs and can benefit for a longer period from their most valuable assets.

An efficient health care system is also one precondition among others, which attracts well-educated individuals, families and wealthy elderly people from other countries to settle down in Switzerland.

Are there typically Swiss prerequisites to tackle this better or worse than other nations?

Switzerland has one of the highest life expectancies in Europe and is also holding a top position worldwide, compared for example to the USA and Russia. Figure 10 shows that Switzerland and the USA are going in the same direction concerning life expectancy. Russia is out of the ordinary due to its lack of sanitation, access to basic health care, problems with nutrition supplies and often also drug abuse; these factors are mostly true for rural areas. Despite having this negative background, Russia's population will be on the rise in the coming decades.

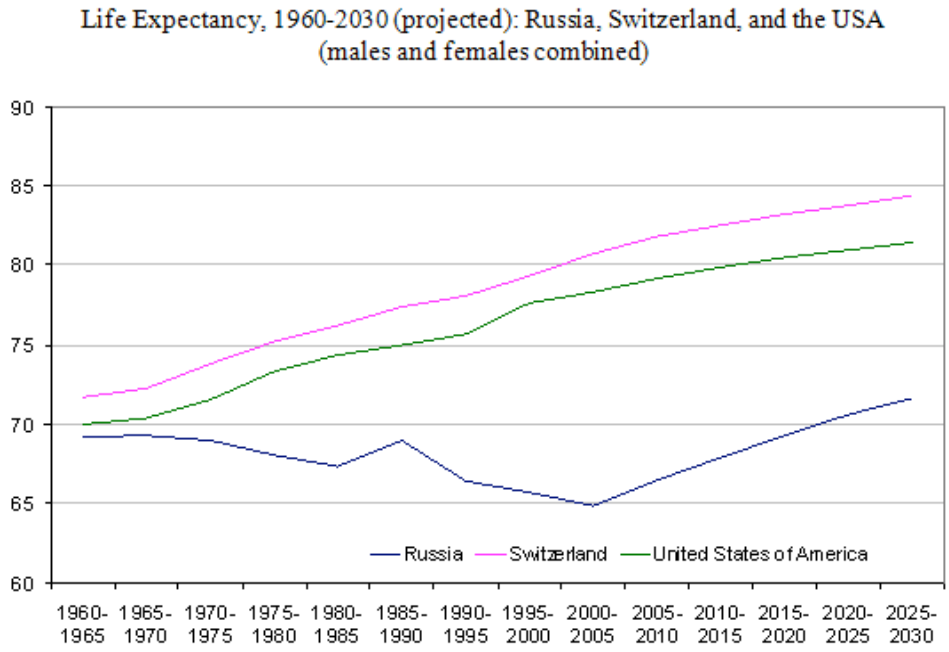

Figure 10: Life Expectancy, 1960-2030 (projected): Russia, Switzerland and the USA (Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp20)

The obligation for a basic insurance is compulsory by law and provides a certain health standard. Beyond this, there is an endless list of cases which can be insured additionally, which are of course are optional and thereby paid out of one's own pocket.

Figure 11 illustrates the fact, that more money spent in the health care sector does not equate with an automatic increase in life expectancy. Compared with Figure 10, the USA has a lower life expectancy, but spends much more money on health care than Switzerland does. This plainly means, that in the USA financial allocation is not executed in an efficient way.

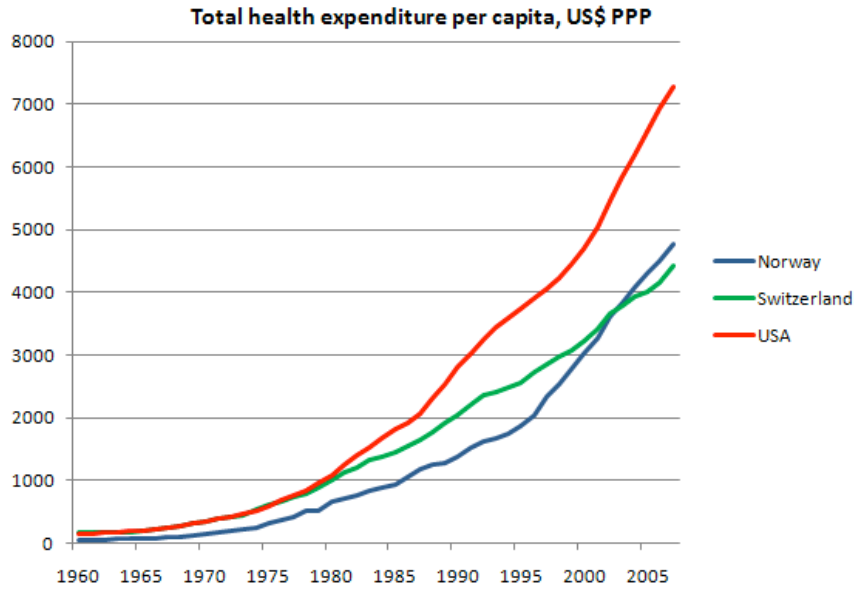

Figure 11: Total health expenditure per capita, US$ PPP (Source: OECD Health Data 2009 - Frequently Requested Data. Retrieved on 4 November, 2009 from http://www.oecd.org/document/16/0,3343,en_2649_34631_2085200_1_1_1_1,00.html

3.3 Migration

How to maintain a growing and competitive economy?

Immigrants play an essential role in Switzerland's economy. According to the Bundesamt für Statistik (BFS) the strong economic growth evident in the second half of the last century would not have been possible without all the guest workers entering Switzerland to look for employment (Bundesamt für Statistik, 2009a). A similar situation can be observed in the recent economic growth phase. Switzerland's average GDP growth rate in the years 2003 to 2008 amounted to 2.8 percent (Bundesamt für Statistik, 2008).

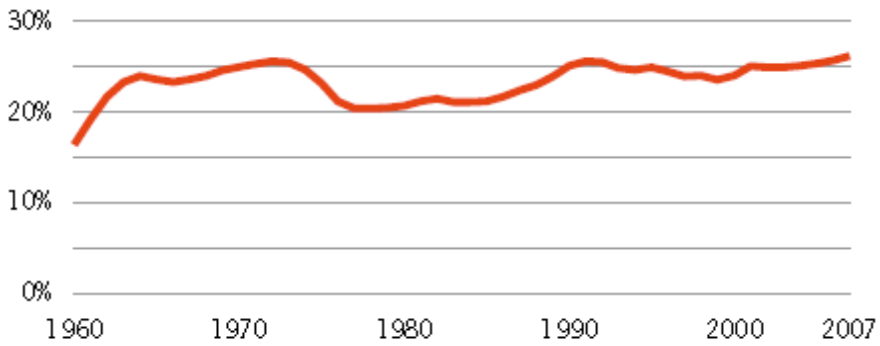

Figure 12: Foreigners as a percentage of the working population (Source: Bundesamt für Statistik, 2009a)

During the same period, the number of foreigners participating in the job market grew by 15.9 percent to a total of 1,207 million foreigners in mid 2008. This is a share of 26.8 percent of the total labour market (see also Figure 12), which means that every fourth person working in Switzerland comes from a foreign country (Bundesamt für Statistik, 2009d). However, the immigration trend is highly dependent on the economic situation and, therefore, when considering the latest numbers, it can be seen that the trend has slowed down due to the financial crisis. According to Groth (2009, p. 22) this current migration situation in Switzerland can be seen as a "mirror image of the economic situation". According to the three scenarios presented in the previous chapter, the migration surplus will balance at around plus 10,000 immigrants per year (see also Bundesamt für Statistik, 2006).

For the economic growth and competitiveness of Switzerland, this trend has two major influences. A growth in the Swiss population as shown in our analysis above can increase productivity through additional human capital in the labour market and also by slowing down the aging of the population. Nevertheless, it can also cause additional costs due to additional unemployment insurance, pension payments and other social costs, as it is not certain that these newcomers can assimilated into being "productive and loyal citizens" (Eberstadt and Groth, 2007, p. 31). From another perspective, migration can also be seen as a sort of buffer in the labour market, which evens out variations in supply and demand. In a phase of economic growth, additional labour supply is gained through immigration and in times of low labour demand emigration can absorb a first wave of unemployment. The latter can be observed by comparing the rates of the second quarter of 2008, which show that the unemployment rate of 6.2 percent among foreigners in Switzerland was much higher than the rate of their Swiss counterparts with about 2.5 percent (Bundesamt für Statistik, 2009d). In addition, this development can also be derived from Figure 13, which shows the unemployment rates of Swiss nationals and foreigners. It can be seen that the unemployment rates of foreigners are much more volatile than the Swiss rates. An explanation for this development can be made by looking at the distribution of the workforce among the different sectors in Figure 14. It

shows that most of the foreigners work in the secondary sector, which is usually hit the most during an economic downturn.

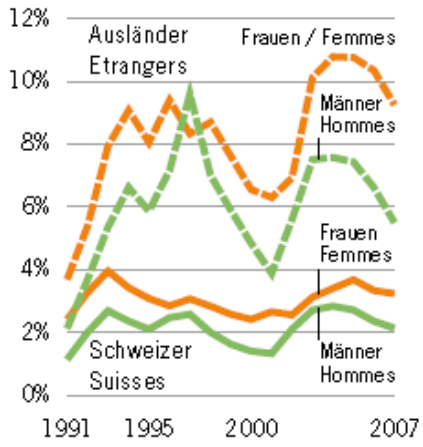

Figure 13: Unemployment rate among foreigners and Swiss people (Source: Bundesamt für Statistik, 2009a)

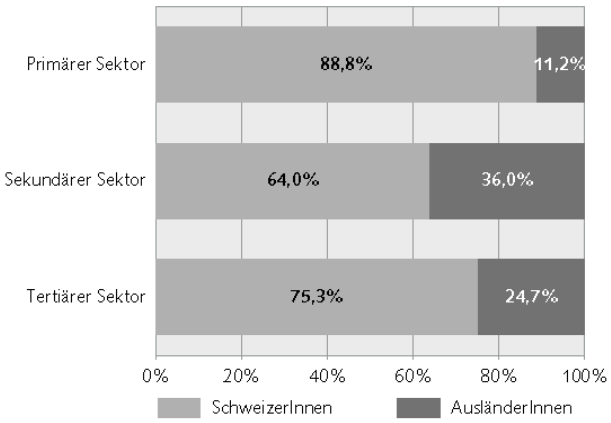

Figure 14: Sector distribution of Swiss and foreign workforce (Source: Bundesamt für Statistik, 2009e)

In order to maintain a sustainable and growing economy it is essential for Switzerland to implement or uphold an effective immigration policy containing laws, which enable a controlled immigration process. It is important that immigrants can be selected regarding their skills and education as well as their ability to integrate and participate in the labour market.

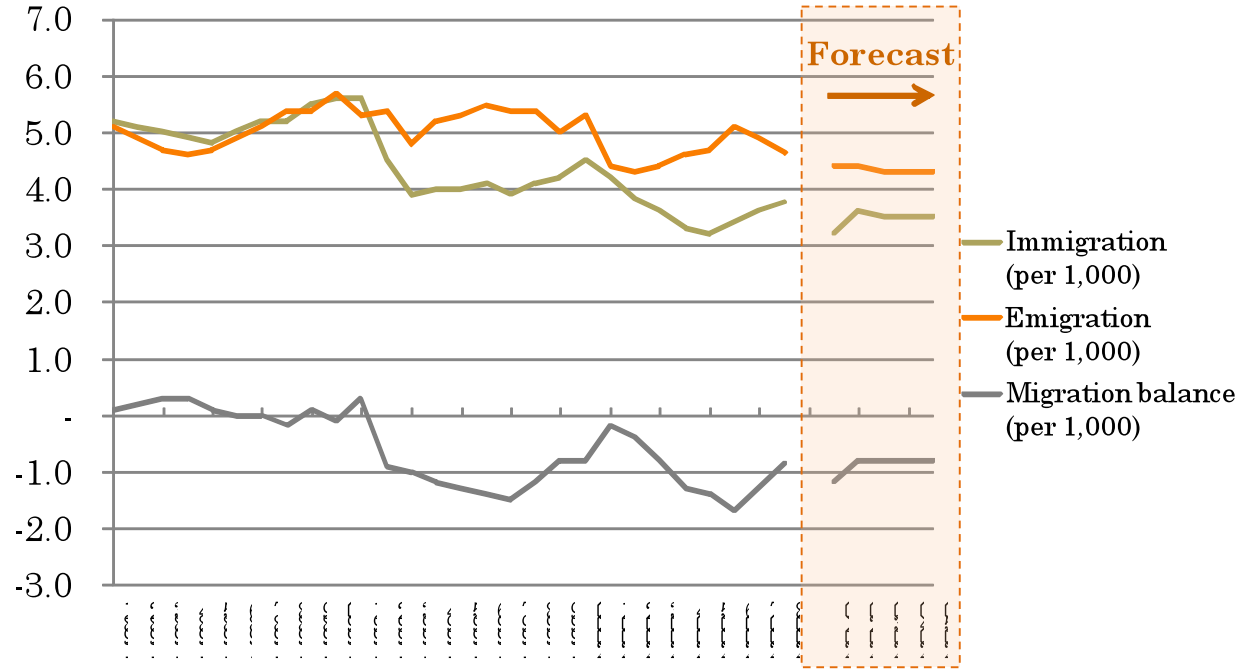

Figure 15: Development of immigration and emigration by Swiss nationals (Source: According to data from Bundesamt für Statistik. (2009). *Indikatoren der Wanderungen in der Schweiz.* Retrieved on October 30, 2009 from http://www.bfs.admin.ch/bfs/portal/de/index/themen/01/06/blank/key/08.Document.67151.xls)

The second influence, which should be addressed, is the so-called “brain drain” through emigration. If a country growth through immigration it is not unlikely that natives consider migrating themselves, be it because of a job loss or just because of another, better opportunity they have abroad (Eberstadt and Groth, 2007, p. 32). Figure 15 shows the migration balance in the past as well as the forecast until the year 2050, which tends to around -0.8 people per 1,000 inhabitants. According to the middle hypothesis this would be a total of about 5,000 emigrants in 2050. The problem with these emigrants is according to Eberstadt and Groth (2007, p. 32), that they are “not only disproportionately self-selected from the prime working-age cohorts, but that they also tend to be better educated and more highly skilled than the peers they leave behind”. A comparison of the educational attainment for the adult population in America and Switzerland shows for example that the proportion of Swiss nationals living in the US, which have attained tertiary education, is much higher than compared to those living in Switzerland. In 2001 the exact numbers were 53.8 percent for Swiss nationals living in America and 26 percent for those living in Switzerland (Eberstadt and Groth, 2007). For Switzerland’s economic development this comparison has a major impact. It shows that Swiss nationals which migrate to other countries often are well educated and highly skilled professionals and therefore are not available on the local labour market. There are two possibilities for restocking this gap of skilled professionals. One is to create financial incentives for highly skilled emigrants who return to Switzerland and the other is to further push tertiary education. Figure 16 shows the predictions for the development of the educational level of Swiss nationals up to the year 2050. It shows that the percentage of people with tertiary education will increase to over 40 percent which would be the idea of the above mentioned solution.

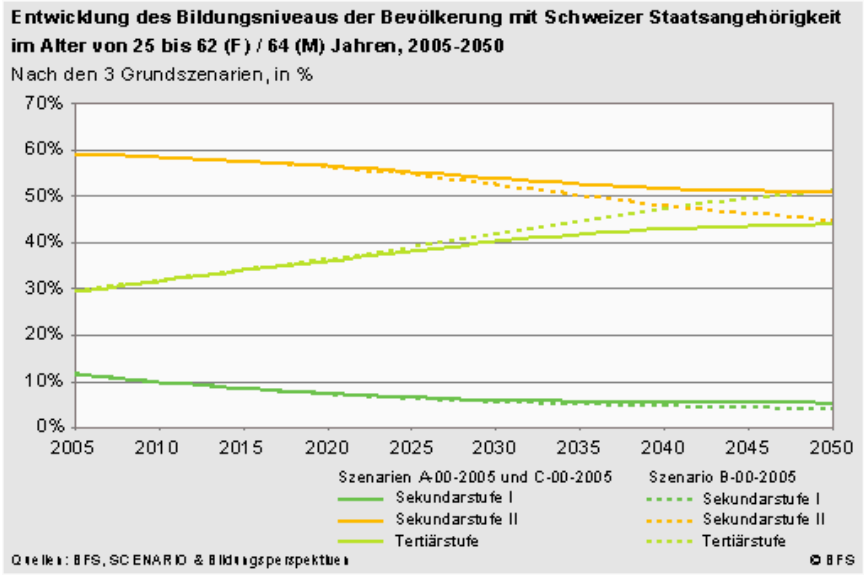

Figure 16: Development of the educational level of Swiss nationals (Source: http://www.bfs.admin.ch/bfs/portal/de/index/themen/01/03/blank/key/bev_entw.parsys.0001.Image.gif)

What are the drivers of success?

The main challenges for Switzerland in the area of migration, on the one side are to maintain a growing population through the immigration of a highly skilled and educated workforce and on the other side not to lose natives with similar characteristics through emigration. The problem regarding the immigration will be that "it remains open as to whether or not Switzerland […] is capable of continuously gaining 0.2 percent through migration until 2050, because if there were a reverse trend in the economic development, the stream of migration would also change strongly" (Groth, 2009, p. 10). It is therefore crucial that Switzerland can attract a skilled labour force by offering a lucrative labour market with a functioning integration concept; this could also have the positive effect of bringing back the previously lost labour force.

Are there typically Swiss prerequisites to tackle this better or worse than other nations?

Until present, Switzerland enjoys a reputation of low taxes, a stable political system and one of the highest living standards on the planet. These qualities are only some of the reasons which are responsible for the increasing immigration during the past few years. Especially since the enactment of the agreement on the free movement of persons with the EU in 2002, the immigration of people from countries of the EU27 and the EFTA increased drastically. Nearly two thirds (61.3 percent) of the foreigners in Switzerland are from one of these countries. In relation to this topic, Switzerland differs from most of the other European countries which are dominated by people from Turkey and other Non-European countries (Bundesamt für Statistik, 2009d). Even though it is likely that these agreements will change in the future, Switzerland had and still has the opportunity to gain some advantages by poaching highly skilled workers away from other European countries. This advance in human capital will be a major competitive advantage for the future.

4 Conclusion

To briefly summarize this thesis, we would like to point out its key findings. It is relevant to recognize that these issues are and will not only affect the Swiss society and economy, but also they have to be seen and treated as major global tendencies. These tendencies will have impacts on every developed western population, at least in the long-term.

In our case, Switzerland is confronted with a declining population, which must be countered by a strengthened immigration of educated and skilled people and preventing a brain drain to other countries.

A further challenge faced by Switzerland is a decreasing labour participation due to an ageing population and a declining birth-rate. Measures have to be made, namely reintegrating the elderly back into our society and rather than viewing them as a monetary burden for our country, see Switzerland benefiting from their brainpower and knowledge.

Another key finding is the length of lifetime and the amount of healthy years which are rising among elderly generations. To gain from this situation and maintain it, continuing and, in a broader sense, preventive investments in health care are required. Only by investing now will we be able to prolong these people's healthy lives for as long as possible to the benefit of the labour market. These combined efforts could also be part of the solution concerning the decreasing labour participation.

Regarding these aspects, we conclude that Switzerland manages these problems quite well; its low taxes and stable political system as well as having one of the highest living standards in the world due to an efficient health care system are supporting pillars for these proposals. In relation to these factors, Switzerland is in a comfortable position compared to other western nations, which will face greater difficulties in accomplishing these challenges. However, there is always the danger of resting on one's laurels. As mentioned previously, efforts in this area should always have preventive characteristics and should be considered as long term initiatives.

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Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 5

Switzerland 2030-2050: Is the inevitable demographic evolution homogeneous across the country or not? What is the potential impact on the economic evolution and potential new industries?

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November 2009
St. Gallen University
Megatrend "Global Demographic Change"
Dr. Hans Groth

Contents

1. Introduction

Switzerland as a highly industrialized country has to face dramatic and far-reaching demographic challenges: while the elderly are getting older, fewer children are being born. Aging cannot be seen as a private matter anymore. Some demographers even prophesize the apocalyptic collapse of the Swiss social insurance system. Our society is threatened by senescence. If we believe demographers – as a rule of thumb – the share of retirees will double by 2050. But who is going to increase our gross domestic product when the working population is continuously decreasing? Michael Skapinker, journalist for the Financial Times, easily answers this question: If the old refuse to die, let them work longer.

As quite often in real life, theoretically complex issues are likely to be over-simplified in political and societal discussions. Even though certain demographic trends seem to be evident on a national level, regional disparities can be observed across the country. In this paper, we will first address the seemingly clear-cut nationwide demographic trends in chapter 2. Then differences between rural and urban areas will be discussed before we examine the regional and cantonal disparities. In order to better understand the opportunities and threats of an aging society, conclusions will be drawn from the historical evolution of Switzerland's population in chapter 3. Thereby, the history of Vals will serve as a positive example to illustrate the population developments of regions in the Swiss Alps. In chapter 4, we then elaborate on the impact of demography on the economic development by focusing on economic growth, labor markets, education and health policy. Finally, chapter 5 discusses what business opportunities and challenges could emerge out of demography as a major global trend. Thereby, telemedicine will be presented as a practical example for a new potential product in the health industry resulting from the unpreventable demographic change. We show that whilst some of contemporary's demographers and apocalypticists feel endangered by the current demographic trends, they also open new business opportunities and thus may enhance economic growth in the future.

2. Demographic evolution in Switzerland

Switzerland is well known for its unique political system based on the principles of federalism. This autonomy of the cantons intensifies regional differences, e.g. in the educational, social security or tax systems, and may explain, amongst other factors such as geographic characteristics, why regions have profited differently from the nationwide economic development of the country. Consequently, this paper analyzes the demography in Switzerland not only on a national, but also on regional and cantonal levels. In addition, differences in the population development in urban and rural areas are highlighted.

2.1. National level

At the end of 2008, the population of Switzerland stood at 7.70 million inhabitants. This corresponds to an increase of 108,400 inhabitants compared to 2007 or a population growth rate of 1.4%, which is the highest population growth since the sixties. The key driver behind this development is the balance of migration, which accounted for about 90% of the population growth with an amount of 98,200 migrants (184,300 immigrants and 86,100 emigrants). The surplus of births, however, only amounts to 15,500 individuals (76,700 births and 61,200 deaths). Relative to the figures for 2007, the balance of migration increased by about 30%, whereas the birth surplus only increased by 15%. Compared to other European countries, Switzerland is among the most dynamic countries in Europe with only Luxembourg (2.0%) and Ireland (1.5%) reporting a higher population growth rate. This high population growth should be seen in the context of the generally sound economic condition of Switzerland and the treaties concerning the free movement of persons with seventeen EU and EFTA member states, which exist since June 1st 2007 (Federal Statistical Office [FSO], 2009a, pp. 1-2).

In 2008, 21.7% of the population were foreign nationals – a slight increase compared to 21.1% in 2007 (FSO, 2009b, p. 7). In addition, the total fertility rate, which measures the average number of children per woman aged between 15 and 49 years, amounted to 1.48 in 2008 compared to 1.46 in 2007. If the total fertility rate is calculated for women according to their nationality, significant differences can be observed. For Swiss women, the rate amounts to 1.37, whereas it is 1.85 for foreign nationals (FSO, 2009c). The average life expectancy at birth was estimated at 84.4 years for women and 79.7 years for men (FSO, 2009d). Sex-specific diseases can explain this difference in life expectancy. Whereas men are more likely to be affected by cardiovascular diseases, young

women are more often affected by lung cancer. As a matter of fact, cardiovascular diseases rank with about 37% as being among the three highest causes of death in Switzerland besides dementia and cancer (Groth, 2009, p. 12).

The Federal Statistical Office published in 2006 a report elaborating on possible scenarios for the population development for the years 2005 until 2050. These scenarios are based upon hypotheses concerning the future fertility, mortality and migration in Switzerland. Thereby, the standard scenario describes the most probable future population path based on historical data taking into account the aftermath of the bilateral agreements between Switzerland and the European Union concerning the free movement of persons. The high and low scenarios are based upon assumptions, which foster or impair population growth and hence define a plausible spectrum for future population development as shown in the following figure. Following the criticism in the publication *Alterung und Wanderung* of Avenir Suisse (2001), the FSO elaborated further scenarios by altering only one of the three drivers of population growth, i.e. fertility, mortality or migration (p. 11). In addition to the three basic scenarios (standard, high and low), two of these alternative scenarios are shown in figure 1 (Alternative 1 and 2), where high or low life expectancy at birth is assumed (FSO, 2006, p. 30).

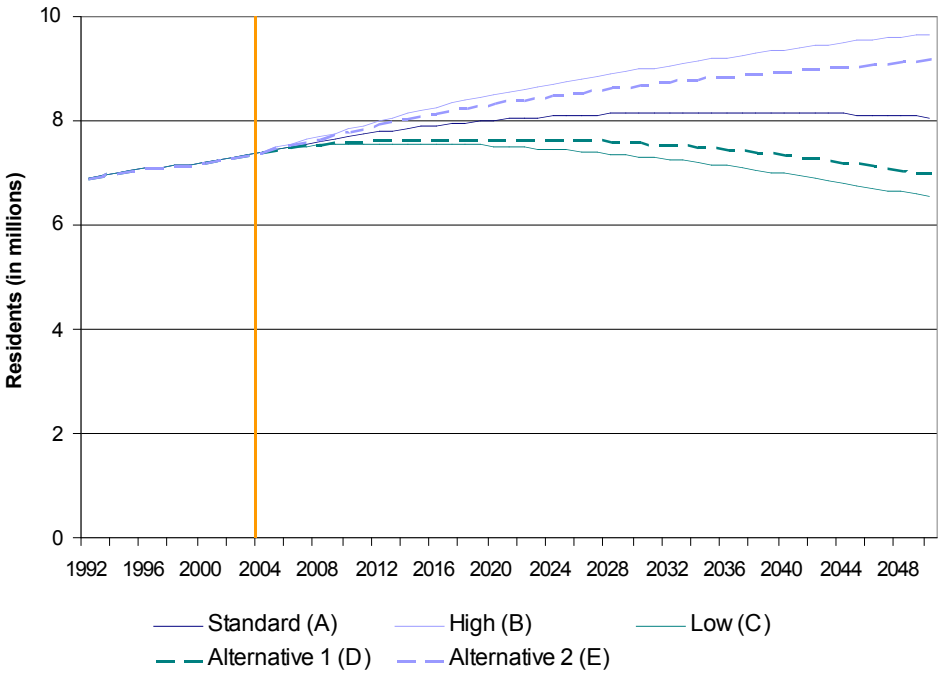
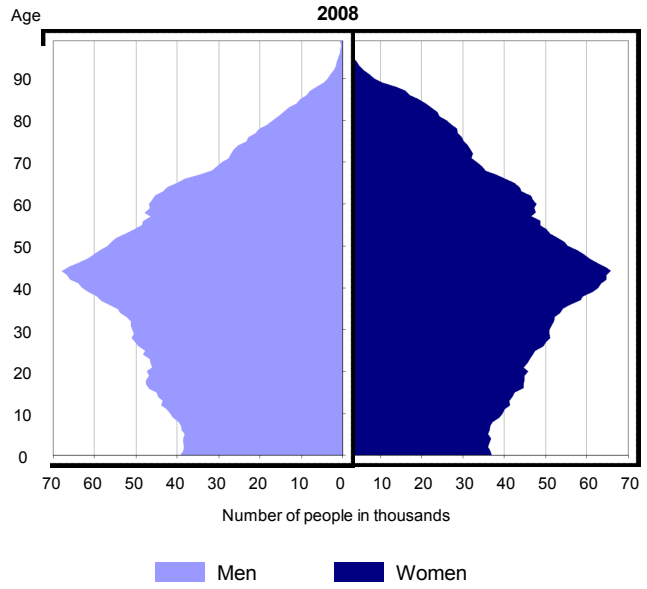


Figure 1: Population forecasts in Switzerland 2005-2050 (FSO, 2006, p. 33)

According to the standard scenario, the population is going to grow until 2036 and shrink beyond because the birth deficit will probably outweigh the positive balance of migration. Furthermore, it is assumed that the extensions of the free movement of persons only temporarily influence the immigration of European citizens (FSO, 2006, p. 24).

Since the standard scenario of the FSO incorporates historical and recent population developments and thus projects a very plausible evolution of the Swiss population, it will serve as a reference for further analysis in this paper, in particular for the development of the age pyramids. Figure 2 shows the actual age pyramids for men and women in 2008. The impact of the baby boom generation with its peak in 1964 can also be seen in today's age pyramids by gender. In 2008, individuals born in 1964 are around 44 years old – exactly where the age pyramid has its peak. Figure 2 also depicts the distribution of Swiss and foreign nationals among different ages in 2008. The distribution of Swiss nationals again emphasizes the impact of the baby boom generation, whereas the distribution of foreign nationals reveals a different fact concerning the working population in Switzerland. There are around 73% foreign nationals compared to only 64% Swiss in the employable age, i.e. between 18 and 65 years old (FSO, 2009e). Due to the decline in the birth rate, there is a lack of Swiss in the workforce (Avenir Suisse, 2009, p. 3). Consequently, the foreign nationals help Switzerland compensate for the lack of skilled workers as well as the lack of offspring, as already indicated above by the differences in total fertility rates. Groth (2009) argues that the majority of people move abroad in their younger years in search of work opportunities or for study purposes. If they settle down in their country of destination, they may usually consider starting a family because of their young age (p. 8).



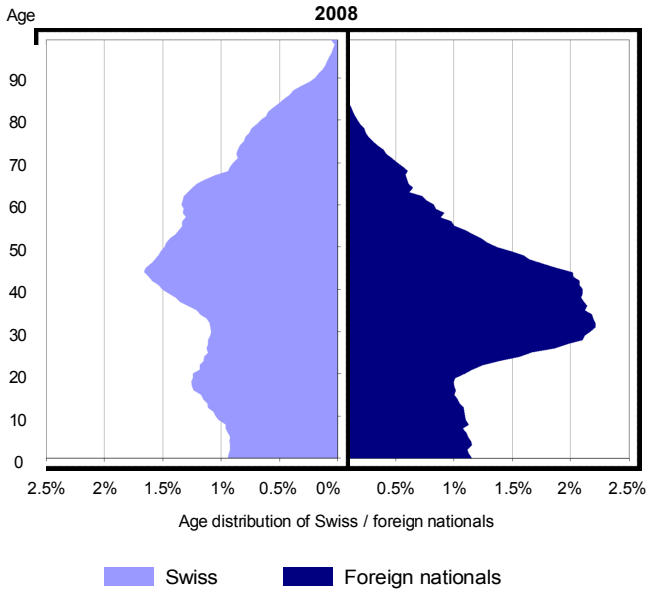


Figure 2: Age pyramids depending on gender and origin (FSO, 2009e)

So how does the population in Switzerland evolve in the future and what insights may the age pyramids reveal for the population structure in 2030 and 2050? According to the standard scenario of the Federal Statistical Office, the age pyramids in figure 3 imply three different trends in the demographic evolution. First, the population continues to grow during the next decades. Second, demographic aging accelerates due to the baby boom generation reaching retirement age in 2030. This bulge of the age pyramid only vanishes in 2050, when these people are of an advanced age and thus becomes less important. In 2030, the second bulge in the age pyramid for persons in the age of 30 to 50 has to be seen in conjunction with the immigration of foreign nationals. Third, the ratio of people in retirement age to those in the employable age is going to

increase to 51 retirees per 100 persons in employable age in 2050. However, after the death of the baby boom generation, the demographic aging will decelerate (FSO, 2008, pp. 13-14).[1]

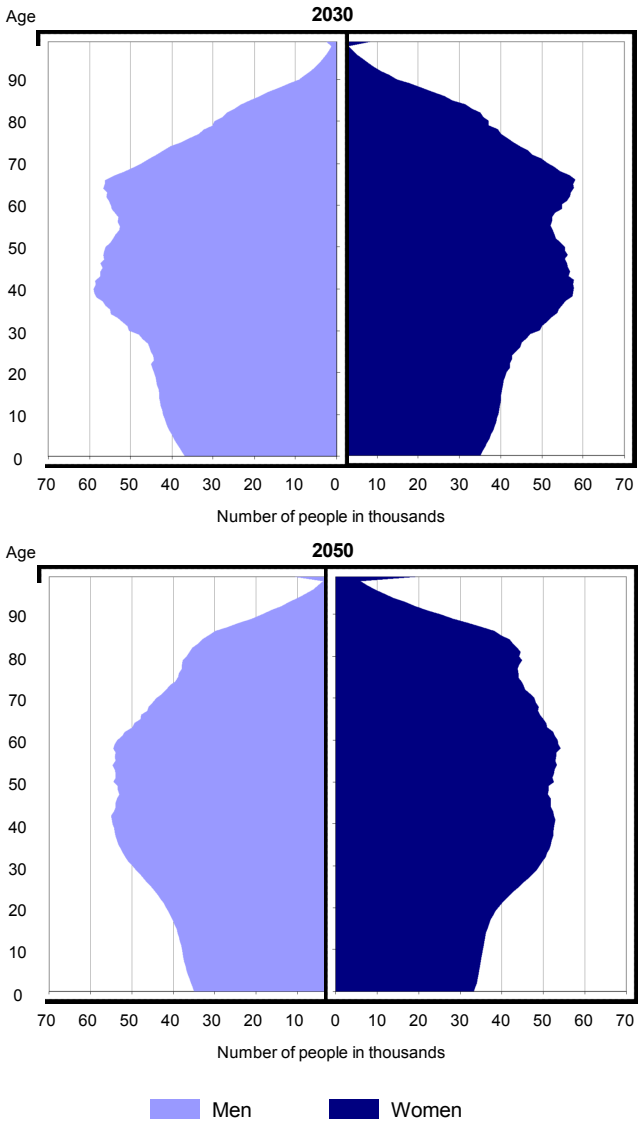


Figure 3: Age pyramids for 2030 and 2050 (FSO, 2009f)

2.2. Urban and Rural areas

Despite the fact that there are general demographic trends on a national level in Switzerland, not all regions of Switzerland experience the same demographic evolution. Significant differences can already be observed by analyzing urban and rural areas. As shown in figure 4, even though both urban and rural areas record a phase of continuous population growth during the last decade, the growth rate in urban areas always surpassed the one in rural areas.

From 1981 until 1998, urban areas only slightly grew compared to a relatively high growth rate in rural areas because of a decline in population growth in the agglomeration of urban areas (FSO,

[1] Please consult the appendix for the age pyramids in the years 2020 and 2040

2009h). However, since 1999, the population growth in urban areas is again higher than in rural areas corroborating the general trend of urbanization (FSO, 2009i, p. 2). Thereby, cities and metropolitan agglomerations denoted with 63.2% and 62.6%, respectively, the highest percentage of residents in the labor force for the year 2000, whereas it is 58.7% in rural areas. Furthermore, the disparities in age between urban and rural areas are more pronounced in the German- than in the French-speaking parts of Switzerland. This is, amongst other things, due to a higher segregation of life styles, a higher individualization of cities and increased childlessness in urban areas of German-speaking Switzerland (FSO, 2005a, pp. 46, 49-50). In addition, immigration is mainly concentrated on large economic centres, which offer the most employment opportunities. As a matter of fact, relocating to another country is usually related to a professional relocation (Credit Suisse, 2009, p. 9).

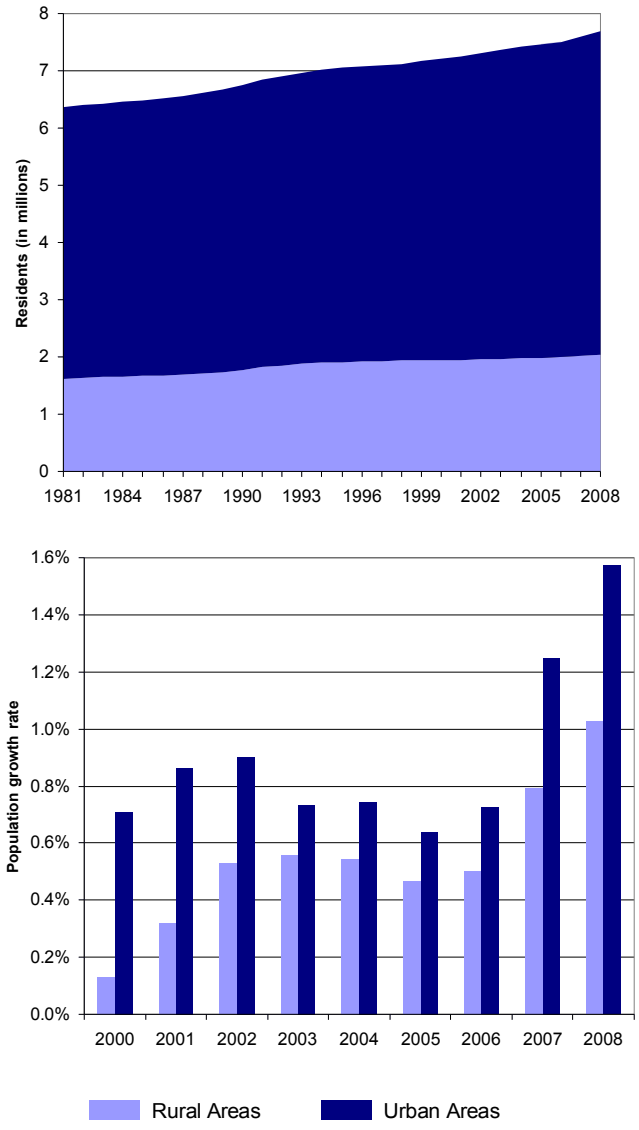


Figure 4: Population development and growth in urban and rural areas (FSO, 2009g)

2.3. Regional level

In the 1970s, Eurostat set up the "Nomenclature of Statistical Territorial Units" (NUTS), which divided up the European Union's territory in order to gather regional statistics for the Community (Eurostat, 2009a). Since 1998 Switzerland participates in the NUTS regional system, where the following seven regions are classified as NUTS-2-Regions: Lake Geneva, Espace Mittelland, North Western Switzerland, Zurich, Eastern Switzerland, Central Switzerland and Ticino (FSO, 2009j)[2]. Figure 5 shows the population growth of the seven different regions for 2007 to 2008. Espace Mittelland and Eastern Switzerland denote the lowest population growth, which is not surprising given the fact that the two regions are still losing inhabitants due to domestic migration (Groth, 2009, p. 6).

Between 2003 and 2007, the cities Geneva, Zurich and Lausanne benefited most from international immigration, which is also mirrored in the high population growth of the two NUTS-2-Regions Lake Geneva and Zurich (Credit Suisse, 2009, p. 10). Lake Geneva and Zurich also depict the highest balance of migration per 1000 inhabitants for 2008 with 18.7 and 16.6 newcomers per thousand inhabitants, whereas Espace Mittelland again records the lowest balance with 8.1 per thousand inhabitants (FSO, 2009l). Furthermore, the Lake Geneva region accommodates the largest number of foreign nationals in absolute (436,579 residents) and relative (30.4%) terms in 2008. On the other hand, Espace Mittelland has with 15.4% the lowest share of foreign nationals among all regions in 2008 (FSO, 2009k)[3].

[2] Please consult the appendix for information about the aggregation of cantons to the NUTS-2-Regions as well as the shares of total population of these regions

[3] Please consult the appendix for the percentage of foreigners in all NUTS-2-Regions for 1999-2008

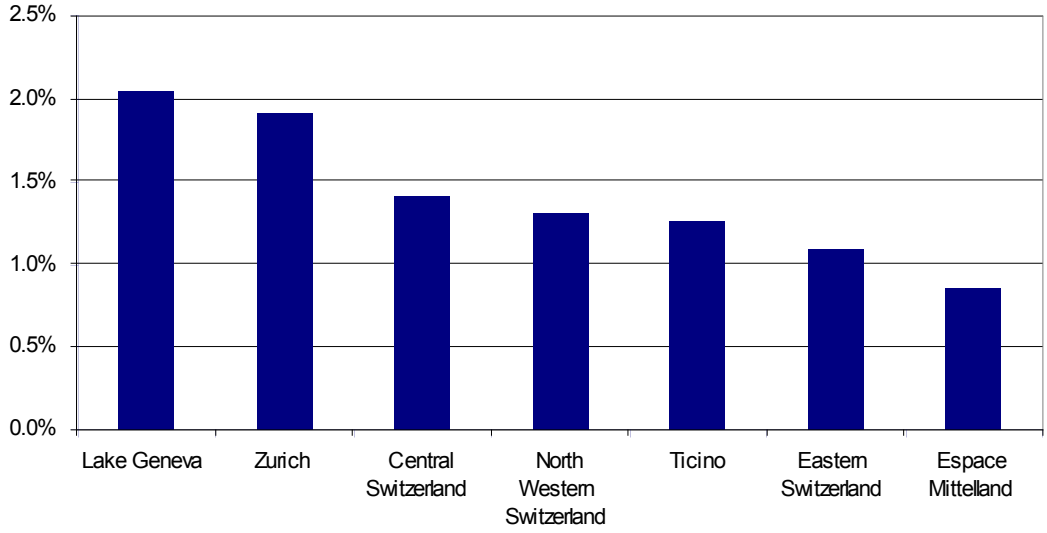


Figure 5: Population growth by regions 2007-2008 (FSO, 2009k)

2.4. Cantons

On a federal state level, population growth is also not homogeneous among the cantons with Basel-Stadt being the canton with the lowest growth rate (-0.04%) between 2004 and 2008. Martin Schuler explains that even though Basel has a competitive advantage during today's recession with its still booming health industry, a wide variety of job opportunities are needed in order to generate population growth. Zurich and Geneva, however, offer a lot of different positions. Furthermore, he points out that the Swiss population of Basel is relatively over-aged and that the younger labor force (aged 40 or less) mainly consists of foreign nationals or cross-border commuters (Eugster, 2009).

If we only consider the growth rate between 31st December 2007 and 31st December 2008 as shown in figure 6, Glarus records the lowest and Waadt the highest growth rate followed by Freiburg, Zurich and Schwyz[4]. In addition, the share of foreign nationals in the cantonal populations[5] is highest in Geneva (38.1%) followed by Basel-Stadt (30.7%) and Waadt (29.9%) in 2008. The cantons Uri, Appenzell Innerhoden and Nidwalden record the lowest shares with 9.1%, 10.1% and 10.6% respectively (FSO, 2009k). In addition to the scenarios for Switzerland, the Federal Statistical Office calculated forecasts of the population growth rates for all cantons. Thereby, the cantons Zug, Freiburg, Appenzell Innerhoden, Nidwalden and Schwyz have the

[4] Please consult the appendix for the respective figure for 2007-2008

[5] Please consult the appendix for the share of foreign nationals by all cantons in 2008

highest growth rates, whereas Basel-Stadt, Glarus and Uri show a decline in population (FSO, 2007, p. 4)[6].

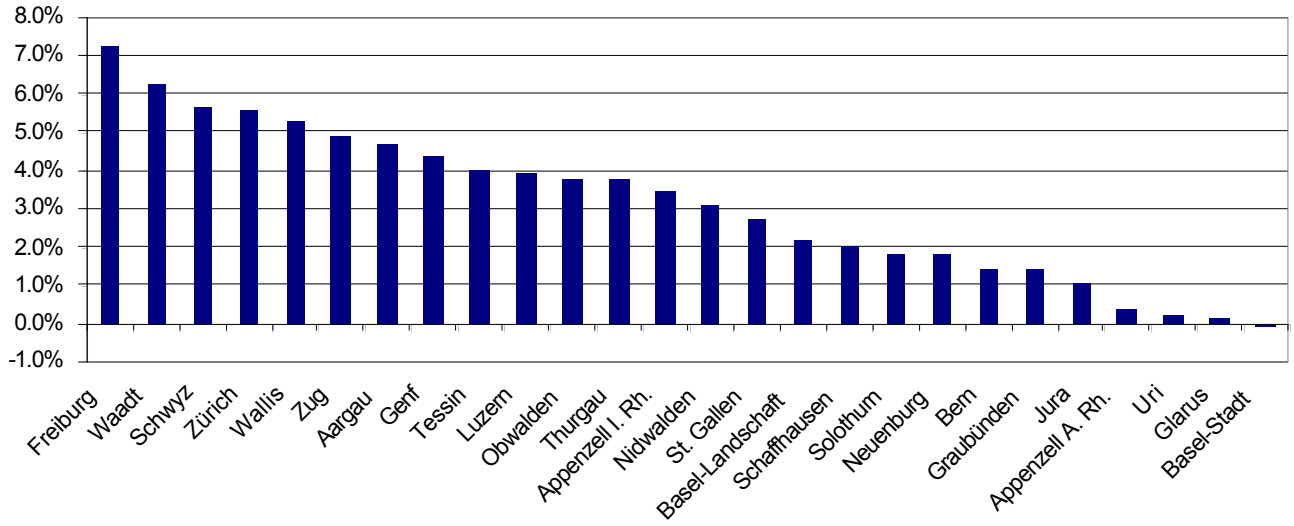


Figure 6: Population growth by cantons 2004-2008 (FSO, 2009k)

During the next years, the population in all cantons will experience demographic aging due to the low birth rate as well as the further increase in life expectancy. City cantons, however, can decelerate the aging process somewhat thanks to national and international migrations (FSO, 2007, pp. 3, 14). Groth (2009) argues that the peripheral regions fail to attract foreign immigrants as well as lose their employable population through migration and that this "structural aging process" is going to accelerate in the future (p. 9).

3. Swiss Demographic History – Lessons Learned

3.1. Overview

Looking at the historical evolution of Switzerland's population, one has to keep in mind that statistical data was not collected before 1798. The first federal Population Census was realized in 1850, ten years later the Federal Statistical Office (FSO) was founded (Calot, 1998, p. 5). As data was statistically evaluated only after this time, most of the studies concentrate on the time period after 1850. Hence only the period from 1860 until now will subsequently be analyzed.

[6] Please consult the appendix for the population growth and the share of people aged above 64 by cantons for 2005-2030

Since 1860, Switzerland's population grew from 2.5 million to 7.7 million people in 2008. This constitutes an average growth rate of 0.76% per year. However, the growth rate was not steady over time but had several peaks and slowdowns. As can be seen in figure 7, periods of rapid population increases can be found between 1890 and 1910 as well as between 1945 and 1970. Slower growth rates characterized the years from 1860 to 1880 and the period between the two World Wars. In 1918 and from 1975 to 1977 even negative growth can be observed (Calot, 1998, p. 7).

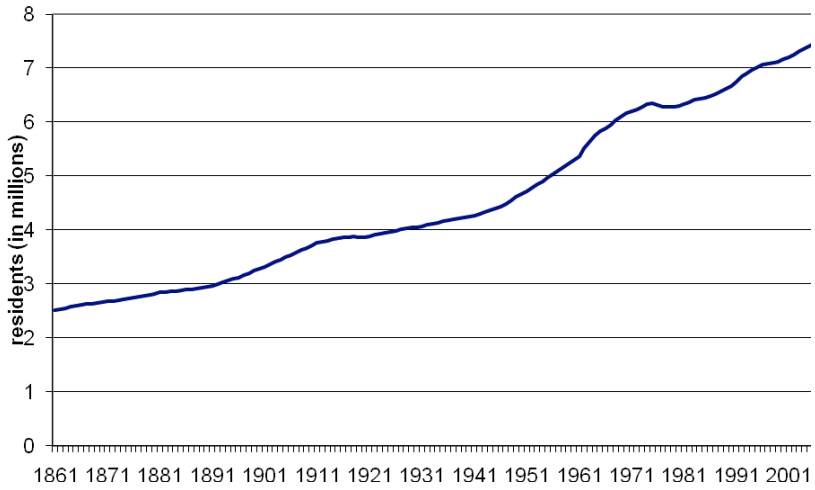


Figure 7: Total Population Size of Switzerland 1860-2008 (FSO, 2009o)

According to Calot (1998, pp. 7-8) the main drivers of the growth rate are net migration, the fertility rate and the mortality rate. The fertility rate was very high from 1938 to 1978, but has been steadily declining since then: in 1875, 4.4 children per woman was the statistical average, whereas in 1997 this number fell to 1.5 children per woman. The mortality rate has been significantly declining as well over the last 120 years: the infant mortality rate has fallen from 20% to 0.5 %, the probability of dying for Swiss inhabitants aged between 1 and 20 has been divided by 20 for men and 30 for women, and the chance for a young man to be able to celebrate his sixtieth birthday has risen from 50% in 1870 to 89% by now (Calot, 1998, p. 119). However, the most important driver of the growth rate is the net migration. Calot states that the net migration[7] is the main reason for the fluctuations in the Swiss growth rate (1998, p. 7). Overall, the migration rate was positive almost all the time except in the years from 1872 to 1887 and in the 1930s (Calot, 1998, p. 7).

[7] Net migration consists of immigration minus emigration.

3.2. Vals – a Positive Example from the Swiss Alps

The story of the Welsh population in Switzerland is a story of population movement, of immigration and emigration. It is therefore an appropriate example for demographic studies.

The Welsh story in Switzerland began in the year 1000, when a small group of Alemani started to settle down in the high plateau of Goms, which is in today's canton of Wallis. From there, they expanded in the 12th and 13th century southwards into North Italy and eastwards into the region of today's canton of Graubünden. Reasons for this migration were overpopulation, poverty and colonial intentions of the Welsh feudal lords (Walser Vereinigung Graubünden, no date).

Over the last one hundred years, a general trend to emigration and centralization in big population centres could be observed in mountain regions (Hornung & Röthlisberger, 2005, p. 15). Welsh settlements do not seem to constitute an exception: Kreis (1958) states that a lot of Welsh preferred a more comfortable life in the lowlands and therefore emigrated from the 19th century onwards (p. 301). As an example, he presents the small village of Safien in the region Surselva. The following graph, presenting the population development of Safien over the last 150 years, shows that there was an almost constant decrease in the population from 685 inhabitants in 1850 to 308 in 2000.

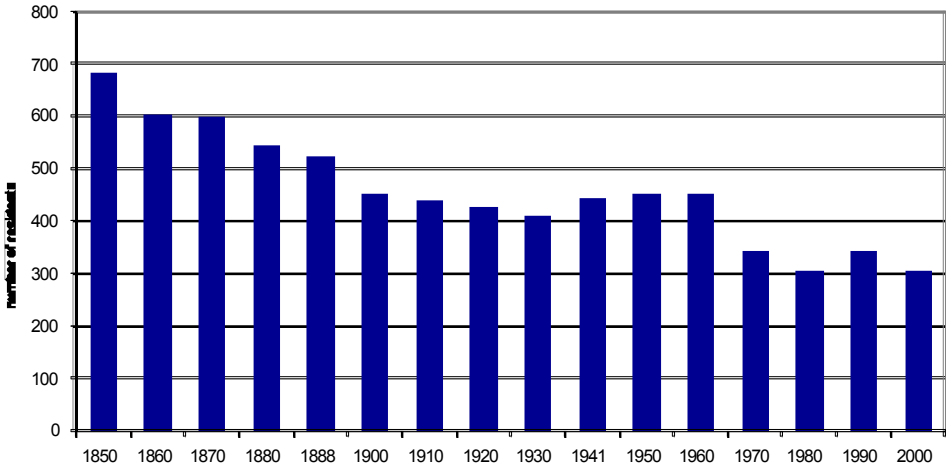


Figure 8: Population of Safien, 1850-2000 (FSO, no date)

However, if one takes a look at another village, situated also in the Surselva, not far away from Safien, one can observe a different development.

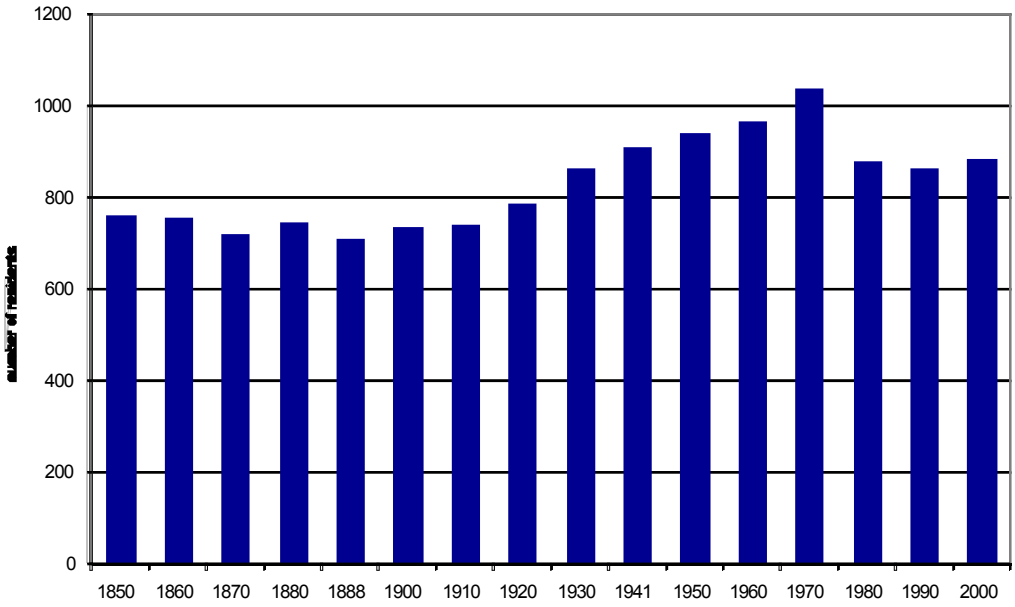


Figure 9: Population of Vals, 1850-2000 (FSO, no date)

In 1850, Vals had almost the same population size as Safien, namely 761 inhabitants. However, over the observed period they were able to increase the population slightly, in contrast to the general trend of mountain regions. In order to draw some useful conclusions from the Swiss demographic history, it is therefore a fruitful approach to discuss the reasons for Vals' positive development of the population. Looking at figure 9, it is striking that from 1850 to 1900 the population tended to decrease, as in Safien. Afterwards, however, the shrinkage could be stopped. What happened there? First, it has to be said that the shrinking of inhabitants in the last years of the 19th century was mainly due to the industrialization and the subsequent emigration-waves to the United States (Riederer, 2009, p. 21). During World War I the incentive to migrate to a foreign country disappeared, leading to a stabilization of population figures. In the following years of financial crisis, tourism, which had started in the late 19th century with the construction of the Hotel Therme in Vals, broke down. This led to an increased agrarian production, which was followed by a population increase in the 1930s (Riederer, 2009, p. 29). Furthermore, Vals benefited from the construction of the street to Zerfreila, which was supported by the national work-creation scheme.

If one compares the figures of Vals and Safien, one observes that the main difference in development happened after 1950. Whereas in Safien the population remained constant and decreased later on, in Vals the positive development could be retained. The reason for the increase in population after 1950 can be seen in three major constructions happening in the area

of Vals: a hydropower plant in Zerfreila as well as avalanche barriers were built. After having finished these constructions, the building of a new health resort and some facilities of the company Valser Minerallquellen AG began. These construction sites drew many guest workers into the valley and triggered an economic upsurge. However, in the seventies the financial crisis led to a cutback in construction. Together with the trend to fewer children per family this was followed by a decrease of the population in Vals. However, in the eighties the Swiss economy recovered and a third major company besides the Thermes and the Valser Mineralquellen AG was founded: the "Steinbruch Waalitobel" which is now a global supplier of flagstones. Furthermore, with the economic upsurge, tourism started to spread again. (Riederer, 2009, pp. 31-37).

In a nutshell one can state that the past has mainly taught us that demographic evolution was always strongly connected with the economic development. Poverty led to emigration, whereas economic well being constituted an incentive for immigration. To balance the trend of over-aging and retain a positive economic development, it is therefore necessary to provide job opportunities and economic incentives. As could be seen in the example of Vals, three major companies offering jobs and money were the main reason for the exceptional development of the population figures compared to other villages in the mountain region. Of course, these economic measures must be supported by political circumstances, which favour globalization. The example of Vals showed that the liberal attitude of Switzerland in the late 19th century led to increased British tourism in Switzerland, which was followed by the founding of the Hotel Therme. The Hotel laid the ground for the tourist attraction of Vals, which still constitutes a major competitive advantage for the small village in the Swiss mountains.

4. Impact on the economic evolution

In the last chapter, we concluded that elaborating on the history of Vals closely links the demographic and economic developments of Switzerland. As a matter of fact, the demographic evolution does affect the economy in a multitude of different spheres. First, we will address the impact of demography on economic growth. Then we will focus on three different spheres of the economy in order to explain the consequences of current demographic trends as well as elaborate on potential actions to tackle issues related to these population developments.

4.1. Demography and economic growth

The current demographic trends challenge the evolution of the economies all around the world. In particular, developed countries such as Switzerland have to produce more goods with a steadily decreasing workforce. First, an aging society is reflected by a decline in the labor force and an increase in the number of retirees. Consequently, productivity gains become the main source for economic growth (Roth, 2006, p. 3). Figure 10 shows how a combination of population growth, a lower employment rate as well as a lower number of working hours impair the per capita GDP growth. In this regard, Japan presents an exemption because the country will already have overcome most of the challenges of its aging society by 2025. Even though an aging society can impair per capita GDP growth due to a decrease in labor supply, Aghion, Howitt and Murtin (2009) explain that a higher life expectancy and a lower mortality rate are both growth-enhancing (p. 23). Thus healthy aging and the policy measures described in the following chapters may outweigh the generally negative effect of a decrease in the labor force on economic growth due to the demographic evolution.

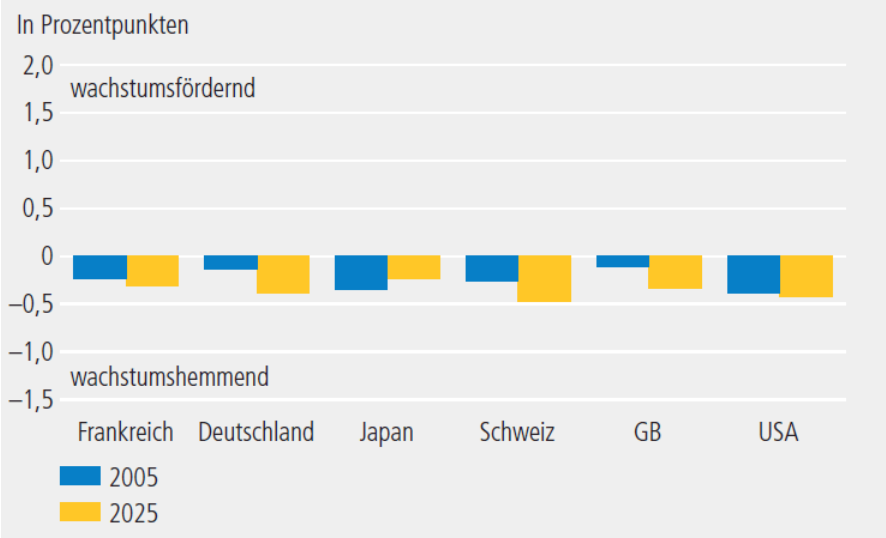


Figure 10: Impact of the aging society on the GDP per capita growth (UBS, 2006, p. 17)

Second, the future population structure as presented in Chapter 2 is likely to influence the savings rate, which could then affect the capital growth in Switzerland as well as the international capital flows between states. The peak in the savings rate is reached approximately at the age of 49 years. People aged less than 18, or more than 79, depict a negative savings rate. As a result, an aging society will negatively affect the private and public savings of an economy (UBS, 2006, pp. 16, 22).

4.2. Labor markets

European labor markets are characterized by generally high unemployment rates and long periods of unemployment. Such structural problems might even aggravate the impact of the contemporary demographic evolution (Eberstadt and Groth, 2008, p. 60). In 2008, Switzerland denoted an employment rate of about 68.4% among older workers aged 55 to 65, which is fairly high compared to the United States (62.1%), the European Union (45.6%), Germany (53.8%), France (38.2%), Austria (41.0%) and Italy (34.4%) (Eurostat, 2009b).

In a letter responding to the strategic document "Switzerland and its Demography" by Hans Groth, the former Swiss Federal Council Pascal Couchepin, who resigned on the 31st of October 2009, emphasizes the necessity to find adequate working models in order to tackle issues related to the demographic evolution in Switzerland. Nevertheless, he recognizes the positive developments in Swiss labor markets, such as the strikingly high employment rate of older workers aged 55 to 65 compared to other industrialized countries as well as a high percentage – about one third – of workers still engaging in the labor markets even though they have already achieved retirement age. However, the average annual hours actually worked per worker in Switzerland slightly decreased from 1991 (1,697 hours) to 2008 (1,643 hours). In 2008, this number is higher than in Germany (1,431 hours), France (1,542 hours) and Austria (1,631), but lower than in the United States (1,792 hours) and Japan (1,771 hours), reaffirming the structural problems of European labor markets (OECD, 2009). In fact, Eberstadt and Groth (2008) identify labor market distortions as a result of high hiring costs and policies, which hamper firing workers in order to explain the phenomenon of the "underworked European" (pp. 60-61). UBS Wealth Management Research demonstrates that every worker in Switzerland would have to work 97 hours more in 2025 compared to 2005 in order to outweigh the negative effect of the demographic evolution on production (UBS, 2006, p. 19)[8].

In his synopsis about the economic challenges of the demographic evolution, Jean-Pierre Roth, chairman of the governing board of the Swiss National Bank, recommends actions to cope with the demographic impact on the labor markets. One measure would be to increase the

[8] This analysis only considers the impact of the demographic evolution on production and does not make any statement about the distribution effect. Nevertheless, an increase in working hours would positively affect the financing of pension schemes (UBS, 2006, p. 19).

employment rate of women through flexible work arrangements. Furthermore, he suggests that older workers should be encouraged to work longer than their legal retirement age if their physical condition allows it (Roth, 2006, p. 5-6). Boxler and Kickbusch (2009) explain that the baby boom generation is the first highly educated aging generation in good health (p. 19). Thus, employees prefer a more flexible transition to retirement. However, certain labor market structures impair the increase in working life beyond retirement age. For example, the fiscal and legal terms of social insurances imply that retiring is at least as beneficial as working beyond retirement age. The 11th AHV revision has the goal to set incentives for a flexible transition to retirement and hence take the current demographic evolution into consideration[9]. Thereby, older workers should have the possibility to advance or defer retirement pay. This is one of the actions, which have been elaborated by a task force of the Federal Department of Economic Affairs (EVD) and the Federal Department of Home Affairs (EDI) to guarantee a flexible organization of working time for the elderly population (EVD/EDI Leitungsgruppe, 2005, p. 19).

As a matter of fact, older workers are usually considered more expensive than younger employees in the economy. First, salaries generally rise in relation to the job tenure. Second, social security taxes are higher for elderly people and third, older workers also claim longer vacations. As a result, there is a strong bias to discard older workers through early retirements in the course of reorganizations within companies (Bundesrat, 2007, p. 28). Consequently, the task force of the EVD and EDI recommends alleviating the reintegration of the elderly population in the labor market. Besides placement services especially for elderly people to facilitate the job search, subsidies shall be paid to companies in order to cover potential job training expenses. In addition, coaching and mentoring services shall be provided to entrepreneurial older workers who would like to become self-employed. Furthermore, employees should have the incentive to work beyond retirement age through the payment of additional pensions (EVD/EDI Leitungsgruppe, 2005, pp. 21-23).

[9] The first draft for the 11th AHV revision was dismissed by popular vote on the 16 May 2004 by 67.9% of the people. A second draft has been worked out. For further information, the reader is invited to visit the homepage of the Federal Social Insurance Office (BSV) of Switzerland:
http://www.bsv.admin.ch/themen/ahv/00011/01301/index.html?lang=de

4.3. Education

Even though the Swiss education system is overshadowed by the moderate performance of Swiss students in the PISA examination, the dual education system in Switzerland guarantees a sound professional education and thus meets the requirements of the economy (EVD/EDI Leitungsgruppe, 2005, p. 16). However, due to the demographic evolution and the transformation of the age pyramids, the number of graduates will continuously decrease as stated by the standard scenario of the FSO. In 2018, 14% less of the youth will enter primary education. Furthermore, already in 2009, the decrease in the number of students entering secondary school is estimated at around 1.6% to 3.9% and in 2018 it will even amount to 10%. As a matter of fact, the professional education will be affected most by the demographic trends. This might even be aggravated by the current economic downturn, which might result in a strikingly large increase in the unemployment rate from 2.6% in 2008 to 5.2% in 2010. Both the demographic evolution as well as the recessive environment might lead to a decrease in the number of students entering professional education of around 11% until 2010. This might finally bring about a lack of specialized workforce. Thus companies need to extend their supply of professional education and offer further professional training in order to address a potential lack of skilled workers (Bildungsspiegel, 2009). Companies might be able to resolve this issue by offering advanced education to older workers. The skills and competencies of the elderly, such as computer and language skills, usually do not meet anymore the contemporary business and job requirements (EVD/EDI Leitungsgruppe, 2005, p. 17). Consequently, it is important to offer additional professional training for the elderly working population.

In an empirical study, Grob and Wolter (2005) state that there is a significant and highly negative impact of an aging society on investments into education, which might be due to the highly direct democratic political structures in Switzerland (p. 19). Bearing in mind that human capital is the most important resource in Switzerland, it is pivotal to sustain and extend investments in education and professional training or in the words of Jean-Pierre Roth: “The Swiss economy can only be competitive and sufficiently grow if it maintains its position in fundamental and applied research. Switzerland has to stay a haven for knowledge” (Roth, 2006, p. 4).

4.4. Health policy

Magnus (2009) states that health care costs are already increasing relatively quickly for non-demographic reasons, such as more expensive health care insurance premiums and diagnostic and treatment techniques as well as relatively low productivity because the health care sector generally employs more labor than other industries (pp. 127-128). In 2007, the health care costs in Switzerland rose to CHF 55.3 billion, which is equivalent to a growth rate of 4.9% compared to 2006. Furthermore, the health care costs make up around 10.8% of GDP in Switzerland in 2007, which is higher than in Germany (10.6%) but lower than in USA (15.3%) and France (11%)[10] (FSO, 2009m, p. 1). In 1960, health care costs in Switzerland only amounted to 4.8% of GDP, whereas they were already 7.7% of GDP in 1985 (FSO, 2009n). In particular, the health care costs for the elderly and chronically sick people in nursing homes grew with 5.4% in 2007 compared to 2006, which lies above the growth rate of total health care costs (FSO, 2009m, p. 1). Consequently, an aging society also has an influence on health care expenditures. For example, patients aged 60 to 79 cost 18% more than the average patient in the Inselspital in Bern. In addition, more than half of all retirees older than 80 years of age spend their remaining years in nursing homes (Ribi, 2009, p. 8-9). Furthermore, the Federal Statistical Office estimates the health care expenditures for 2020 at CHF 67.6 billion, which is equivalent to an increase of 22.2% compared to 2007 or an average annual growth rate of 1.56% (FSO, 2005b, p. 13). Such facts raise concerns in all European countries over potentially exploding health care costs. Eberstadt and Groth (2008), however, argue that medical costs have to be seen in conjunction with the value of health. In an economy, which is mainly driven by its human capital, the health care sector demonstrates a pivotal supporting industry in order to guarantee longer work-life productivity of its people (pp. 63-64). Thus healthy aging requires cautious and sustainable stewardship of available human resources to ensure working capacity and efficiency of the labor force (EVD/EDI Leitungsgruppe, 2005, p. 28).

On the other hand, the demographic evolution also demands a rethinking of policy measures in the health care industry. In Switzerland, the cantons are responsible for the supply of primary health care due to the division of competencies between the state and the cantons. This is a direct outcome of the federalism and the principle of subsidiarity inherent in the political discussions in Switzerland. Therefore it is often difficult for elderly people to know the respective health care services in the Swiss cantons. As a result, there is a necessity to provide these people with the

[10] Most recent numbers of OECD countries from 2006

relevant information and advice concerning the range of services offered. As a matter of fact, Switzerland fails to provide a policy to foster healthy aging and the prevention of age-specific diseases as well as functional invalidity at a federal level (Bundesrat, 2007, pp. 11-12).

Regarding the high balance of migration, another challenge of Swiss health policy will be to guarantee equal opportunities for foreigners. Immigrants are more likely to have parasitic and infectious diseases and usually feel less healthy than Swiss residents. Whereas the mortality of immigrants and Swiss nationals due to lung cancer is approximately the same, immigrants are one and a half times more affected by stomach cancer. Furthermore, the state of health directly influences the integration process. For example, healthy immigrants are generally better integrated into professional life. A key policy measure is to provide immigrants with adequate information about the services and institutions of the health system as well as the respective legislation. In addition, professional health care providers are to get specific training in order to strengthen cultural competencies and remove language barriers (Bundesamt für Gesundheit [BAG], 2007, pp. 13, 28, 30, 47-48).

The ambulatory or stationary health care services are in many respects insufficient. First, jobs in the health care industry are usually underpaid because the public authorities exert pressure on the labor costs due to the state's financial situation. This might even lead to a lack of skilled workers. Second, 3.3% of retirees aged 65 to 79 informally care for other elderly people in the same household. These informal health care services might pose a high burden for the care-giving person and even result in the care dependency of the volunteers. Thus elderly care-giving persons should be even more supported by Spitex services and receive the required medical training. On top of that, the Federal Council of Switzerland will take on coordinating functions in order to establish a national strategy for health promotion and to foster the autonomy of the elderly population (Bundesrat, 2007, pp. 13-14). Second, the aging society, especially the aging health care professionals, creates a high demand for skilled professionals in the health care industry. Until 2030, between 120,000 and 190,000 new professionals will have to be hired. At least two thirds of these workers have to be hired in order to replace current health care professionals who will retire in 2030. About one third of the professionals have to be employed in order to compensate for the aging society due to the demographic evolution (Schweizerisches Gesundheitsobservatorium, 2009, p. 14).

5. Impact on Industries and Opportunities

This chapter aims at giving an overview of the evolving business opportunities due to the demographic evolution in Switzerland until 2050 and looks at the demographic change from a business perspective. First, the Blue Ocean Strategy will be presented as a tool to evaluate strategic opportunities. Afterwards, based on the demographic figures presented earlier in this paper, business opportunities and challenges will be discussed and illustrated with a practical example drawn from the health industry.

5.1. The Blue Ocean Strategy

The Blue Ocean Strategy is an approach for strategy formation developed by Kim and Mauborgne in a book called “Blue Ocean Strategy – How to Create Uncontested Market Space and Make the Competition Irrelevant” (2005). As already implied by the title of the book, the aim of the Blue Ocean Strategy is to shift companies’ attention away from highly contested markets to newly created market space with no existing competitors. Thereby the reach of the Blue Ocean Strategy goes further than pure innovation. Companies are required to strategically establish the company in new markets in such a way that they innovate and break the existing cost structure of the traditional markets at the same time. This approach is labelled “Value Innovation” in order to stress the combination of innovation and value formation by cost-reductions. Kim and Mauborgne promote a “reconstructionist view”, where market boundaries and structures are not seen as being stable but as being redefinable by smart strategic moves. (Kim & Mauborgne, pp. 3-22).

5.2. Opportunities for Industries

As outlined in chapter 2, the FSO calculated different scenarios for the demographic development of Switzerland. Being the most viable scenario, the Standard Scenario will be applied in order to evaluate possible opportunities for the business world. In short, the Standard Scenario predicts three particular development paths:

- Swiss population will continue to grow until 2036. Afterwards the positive migration balance will assumedly be outweighed by the birth deficit, leading to a population decrease.
- The aging of the population will continue. Starting in 2030, the baby boom generation will reach retirement age.
- This will lead to an increase in the share of the retired population: it is estimated that in 2050, 51 people will be retired for every 100 persons in employable age.

For the business world this evolution has several impacts. Kuebler, Mertens, Russel and Tavis (2008, as cited in Mertens, Russell & Steinke, 2008) summarize the five existing challenges for companies:

1. Ensuring innovativeness
2. Retaining older workers and expertise
3. Accommodating older workers
4. Reducing company costs and risks
5. Other issues (p. 356).

On the one hand there are several drawbacks emerging from the demographic trend: especially the decrease in the working population as well as the aging of the workforce poses a threat to companies. Concerning the aging of the workforce, several research papers have been written. Tempest, Barnatt and Coupland (2008, p. 246) suggest, for example, to classify the elderly workers into the following matrix:

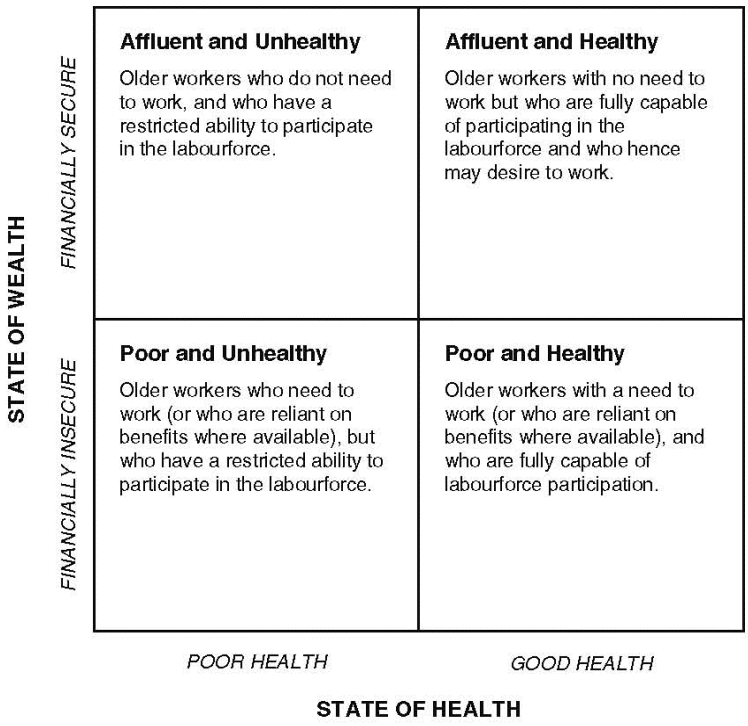


Figure 11: The older worker wealth/health segmentation matrix (Tempest, Barnatt & Coupland, 2008, p. 246)

This highlights the need for diversified schemes for handling an elderly workforce. According to Mertens, Russell and Steinke (2008) adapting a company to the needs of elderly workers concerns mainly two areas:

- physical working environment

- accessibility[11] of hard- and software (pp. 362 – 363).

Some of the capabilities of elderly people tend to decrease. Next to physical capabilities, also cognitive features may change in seniority. Mertens, Russell and Steinke mention the following possible age-related cognitive changes:

- decrease in selective attention
- decrease in working memory capabilities
- decrease of divided attention[12]
- reduction of fluid intelligence, including information processing
- prolongation of reaction times (p. 363).

It is therefore important for companies to design a physical working environment and use hard- and software that is appropriate for the needs of the older workforce.

The aging of the workforce further poses the threat of losing knowledge from retiring employees. Companies therefore have to implement measures in human resources in order to facilitate knowledge transfers from older to younger employees. (Mertens, Russell & Steinke, p. 360). A further possibility would be to hire retirees as freelance consultants.

Beside these challenges, the aging of the population also constitutes huge chances for companies, as the soon retiring baby boom generation forms a strong consumer group. In the literature, this is often labelled as the "silver market phenomenon". For companies the generation 50+ is highly attractive, as baby boomers possess a formidable purchasing power. In 2007, they had on average a gross monthly income of CHF 10,036 per household at their disposal (Müller, 2007, p. 11). The baby boomer generation as a consumer group is furthermore characterized by a demand for high quality, convenience, competent advisory and good service (Müller, 2007, p. 12). Osl, Sassen and Oesterle (2008), however, identified various needs of elderly consumers in their study. They therefore concluded that elderly people form a heterogeneous target group, which needs individually designed products and services (p. 3).

[11] Accessibility is defined as "a product's capacity to be used by everyone, regardless of abilities or disabilities" (Mertens, Russell & Steinke,2008, p. 362)

[12] Divided attention allows people to complete different tasks simultaneously (Mertens, Russell & Steinke, p. 363)

Looking at the silver market phenomenon from the viewpoint of the Blue Ocean Strategy, the huge opportunities for companies become evident: a whole new market is developing, creating new uncontested market space for companies. Whereas the Blue Ocean Strategy demands companies to actively create such markets, here is the opportunity for firms to just step into markets, which actually develop themselves. However, in order to really profit from these markets, companies have to innovate and break existing cost structures (Kim & Mauborgne, 2005, p. 13). As a result, almost every industry can profit from the demographic change, provided that companies are ready to invest into the silver market with value creating innovations.

5.3. Practical example

One industry, which promises to benefit greatly from the demographic trend, is the health industry. The need for medicine and health care will increase together with the share of elderly people. The following chapter therefore quotes telemedicine as a practical example of "Value Innovation" from the health industry in order to present the opportunities and threats of the silver market.

Telemedicine is generally defined as "the use of electronic information and communications technologies to provide and support health care when distance separates the participants" (Field, 1996, as cited in Grigsby & Sanders, 1998, p. 123). It therefore comprises different technological means that facilitate health care over distances, such as the Internet, interactive video and phones. The first telemedicine programs were developed over 40 years ago. However, the volume of delivered telemedicine remained low for a long time (Grigsby & Sanders, 1998, p. 123). In Switzerland, one of the major providers of telemedicine is Medgate, which was founded in 1999 (Medgate, 2009, p. 1). Medgate offers medical consultations via phone, a second medical opinion, medical information per phone about current issues, medical assistance for customers in foreign countries including the organization of transportation back to Switzerland, and case management for patients with chronic diseases (Osl, Sassen, Oesterle, Fischer, 2009, p. 2).

As demanded by the Blue Ocean Strategy in order to create sustainable uncontested markets, telemedicine constitutes "value innovation", as it operates in a new market and breaks the existing cost value structures in the health care system at once. The future of telemedicine is usually seen as being very promising. Heinzelmann, Lugn and Kvedar (2005) state, for example, that they can "safely assume that developments in mobile communications, sensor devices and

nanotechnology will alter the way that health care is delivered in the future". This positive assessment of the future development of telemedicine is mainly based on the huge opportunities, which the concept constitutes. First of all, as telemedicine changes the existing cost structures, it offers huge potential for cost saving, which is highly attractive in today's financially challenged health care systems. Hence more and more health insurance companies offer their members free medical consultations with Medgate. Furthermore, telemedicine provides a way of interconnecting different actors within the health system and therefore simplifying the proliferation of information (Balch & Tichenor, 1997, p. 5). In addition, in cases of huge distances between health professionals and patients for example in rural areas and of patients with limited mobile capabilities, telemedicine proves very helpful.

However, besides these chances, there are also some threats and drawbacks of telemedicine. Osl, Sassen, Oesterle and Fischer (2009) observe in an interesting study about the future of telemedicine and technical gadgets, as for example an automatic transmission of vital signs to a doctor, several critical points: the interviewees were especially afraid of too much monitoring, the loss of privacy and the decrease of the direct contact with medical staff.

One therefore has to conclude that although the aging of the population offers huge potentials for companies in the health sector, which are prepared to invest in innovations, the limitations set by social values and attitudes cannot be overturned overnight.

6. Conclusion

"No invading army, volcanic eruption or yet undreamt of plague can rival ageing in the breadth or depth of its impact on society." (Laurence, 2002)

This paper attempted to look at the demographic evolution of Switzerland from various perspectives. First, information on the current demographic composition of Switzerland was provided. It was shown that the key driver of the high population growth is a considerable immigration rate. Furthermore, by discussing the demographic evolution of different Swiss regions, it became clear that demographic trends are not homogeneous across the country. In addition, the scenarios of the Swiss demographic future development were presented.

The discussion of the Swiss demographic history showed that the growth rate was not steady over the last 150 years but had several peaks and slowdowns. The case study of Vals, a demographically exceptional Swiss mountain village, explained in detail some of the reasons for the changing growth rate. It became clear that demographic changes in Vals were mainly triggered by economic developments. In the end, large construction projects as well as the existence of three successful companies accounted for the difference to other mountain villages, which have been facing severe reductions in population figures over the last 50 years.

The demographic evolution leads to a decrease in the workforce as long as the retirement age is not changed. A diminished share of the working population may impair economic growth. However, it could be showed that appropriate measures in the areas of labor markets, education and health policy support a healthy aging, which reduce the negative impacts of demographic trends on the working population.

From a business perspective, the demographic development provides opportunities as well as threats. On the one hand, the companies have to deal with a decrease in workforce, facing a possible loss of productivity and knowledge. On the other hand, new, "blue" uncontested markets develop and constitute huge business opportunities for companies who manage to implement a strategy aimed at innovation and the breaking of existing cost-structures.

So, is it really true that demographic change poses a greater threat to mankind than wars and volcanic eruptions, as stated in the quotation of Laurence, a British health editor? Of course, it is difficult to find a definitive answer to such a complex question. However, this paper demonstrated that the demographic future not only has drawbacks but also provides huge opportunities. The main challenge therefore is to find ways of fighting the threats and benefit from the development. In order to succeed, political and economic schemes have to complement each other and work in the same direction. From a business perspective the Blue Ocean Strategy might lead the way to a profitable future, in spite of over-aging and a projected decrease in the working population.

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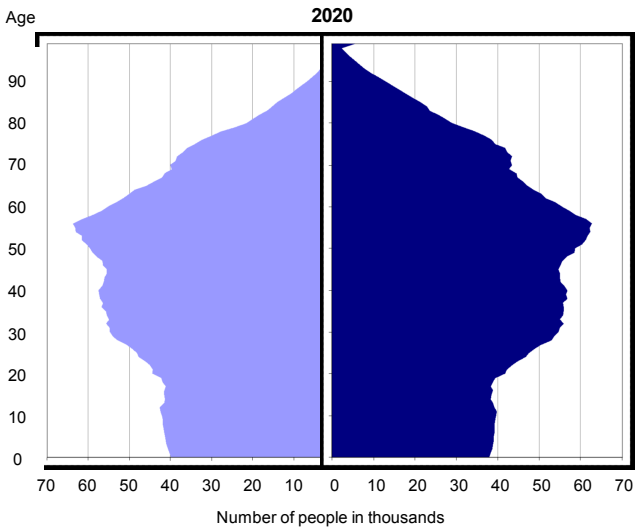
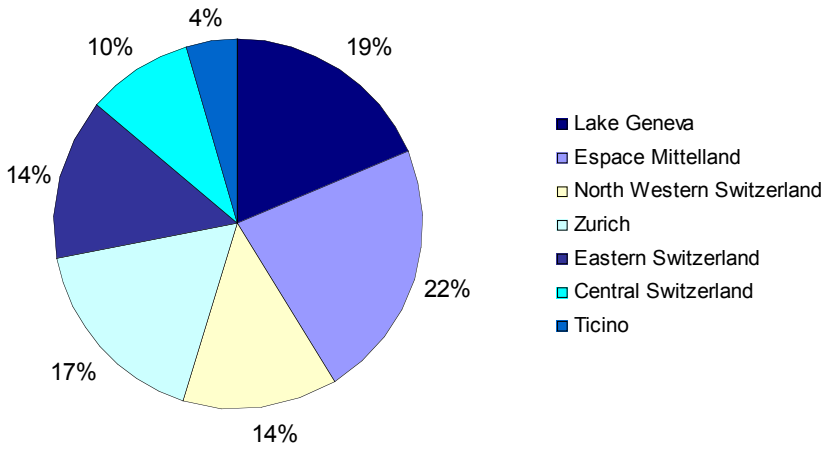
8. APPENDIX: FURTHER MATERIAL

8.1. Age pyramids for 2020 and 2040



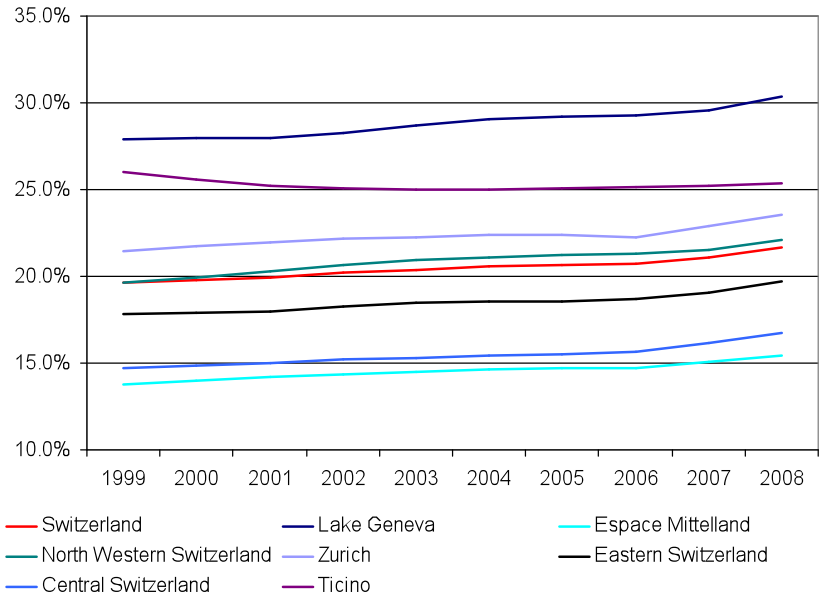
8.2. Population by NUTS-2-Regions in 2008



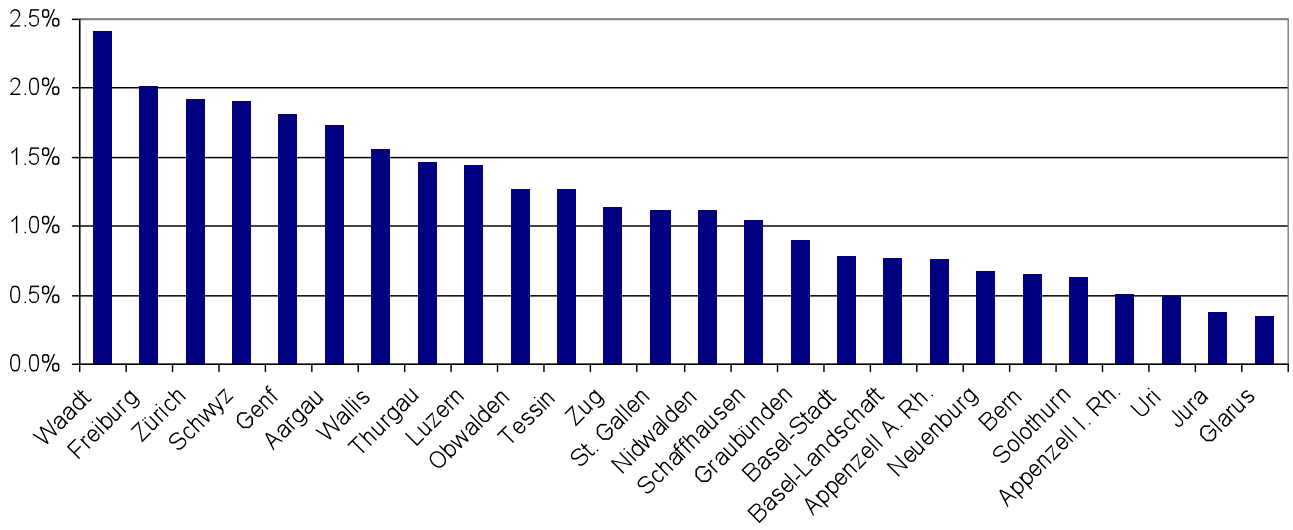
8.3. Aggregation of cantons to NUTS-2-Regions

Lake Geneva:	Waadt, Wallis, Geneva
Espace Mittelland:	Bern, Freiburg, Solothurn, Neuenburg, Jura
North Western Switzerland:	Basel-Stadt, Basel-Landschaft, Aargau
Zurich:	Zurich
Eastern Switzerland:	Glarus, Schaffhausen, Appenzell A. Rh., Appenzell I. Rh, St. Gallen, Graubünden, Thurgau
Central Switzerland:	Luzern, Uri, Schwyz, Obwalden, Nidwalden, Zug
Ticino:	Tessin

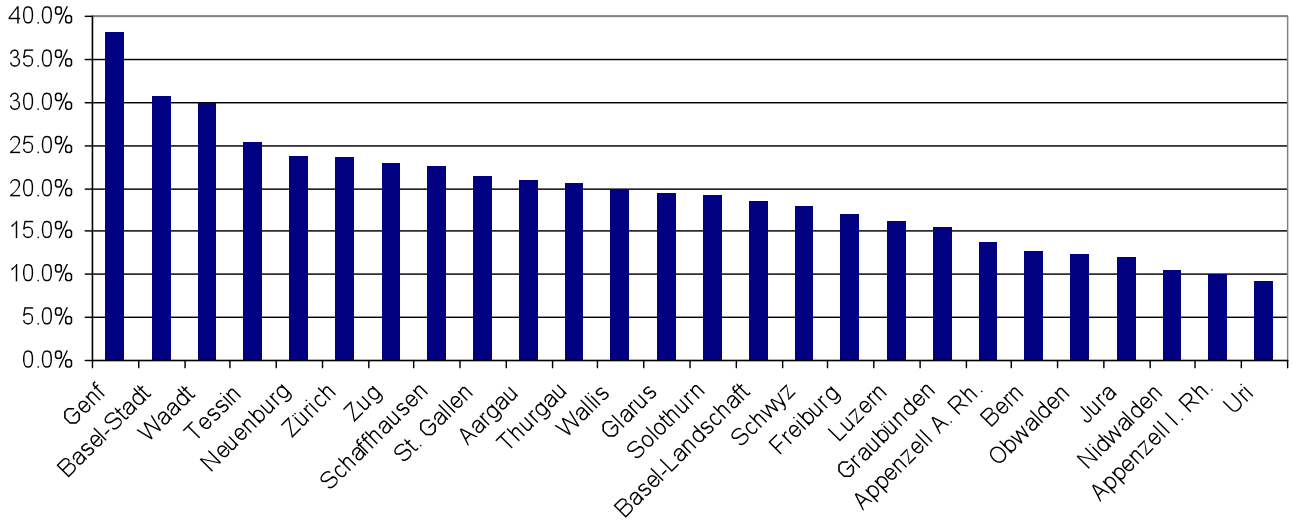
8.4. Percentage of foreigners in NUTS-2-Regions for 1999-2008



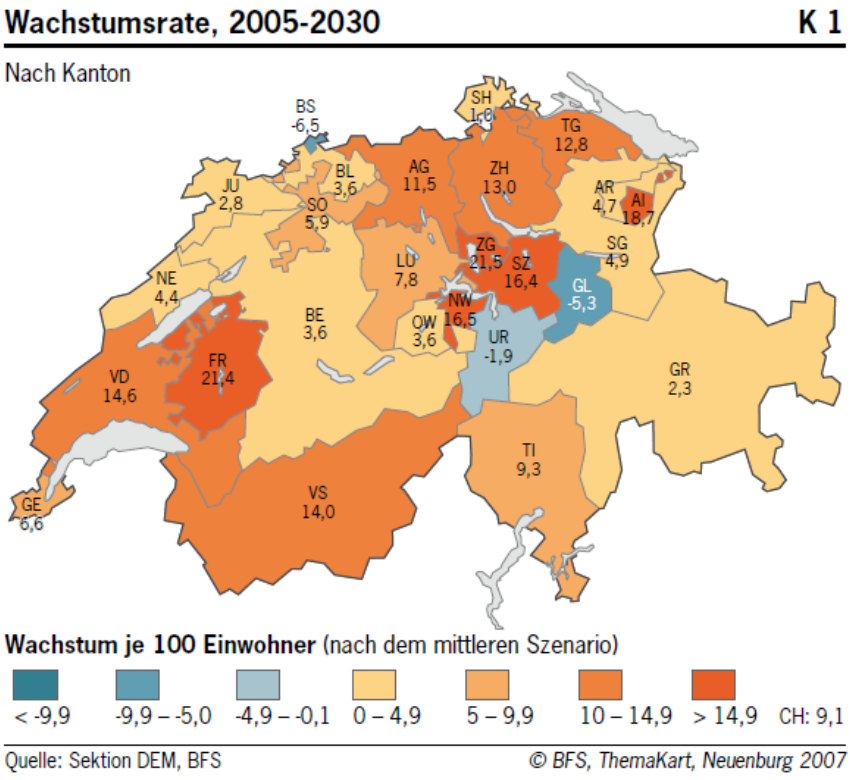
8.5. Population growth by cantons for 2007-2008



8.6. Share of foreign nationals by cantons in 2008



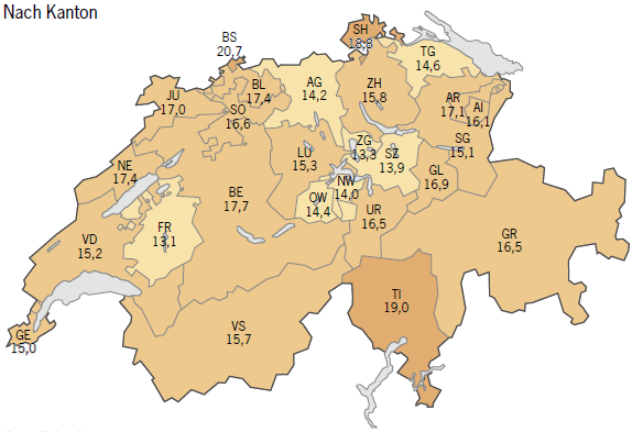
8.7. Population growth by cantons for 2005-2030



8.8. Share of people aged above 64 by cantons for 2005-2030

Anteil der über 64-Jährigen, 2005 **K 7**

Nach Kanton



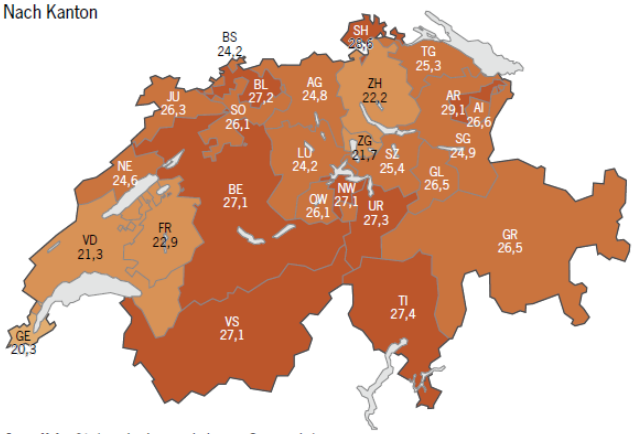
Anteil in %

< 15,0 | 15 – 17,9 | 18 – 20,9 | 21 – 23,9 | 24 – 26,9 | 27 – 29,9 | > 29,9 CH: 16,0

Quelle: Sektion DEM, BFS © BFS, ThemaKart, Neuenburg 2007

Anteil der über 64-Jährigen, 2030 **K 8**

Nach Kanton



Anteil in % (nach dem mittleren Szenario)

< 15,0 | 15 – 17,9 | 18 – 20,9 | 21 – 23,9 | 24 – 26,9 | 27 – 29,9 | > 29,9 CH: 24,4

Quelle: Sektion DEM, BFS © BFS, ThemaKart, Neuenburg 2007

Universität St.Gallen

Hochschule für Wirtschafts-, Rechts- und Sozialwissenschaften

(HSG)

Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 6

Today's youth and not the "baby boomers" will be hit by the potentially harmful consequences of demographic change. Conduct a creative approach as to how citizens aged between 20 and 30 years in two nations of your choice envisage how they will manage this challenge.

Authors

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November 2009

St. Gallen University

Megatrend "Global Demographic Change"

Dr. Hans Groth

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1 INTRODUCTION

This paper provides an insight into the knowledge and perceptions about the demography of today's youth and we have attempted to understand the concerns of this generation regarding demography. The pressure of a graying society is the youth's sword of Damocles. The level of awareness and understanding of the interconnections existing in the ageing process are crucial to forecast the future society and the way demographic challenges will be handled. To transform challenges into opportunities, actions have to be undertaken.

By conducting a survey within our countries of respective citizenship, Germany and Switzerland, we have been able to gain some real input data about the so-called "Generation Y".

2 GENERATION Y

"Generation Y" designates the young population between the ages of 20 and 30 in 2009. They are the children of the baby-boomers and are different from them in many ways. Generation Y is now entering their student years or embarking on their professional careers. They will study longer and have the tendency to stay longer at their parent's home than ever before. Therefore, the average age for marrying is increasing as well as the average age at which people are having their first child. In comparison to their baby-boomer parents, young people have higher expectations of the world; they are perfection seekers. Moreover, they are more independent and more self-centred. It seems like Western society is regressing toward an individualist society, where the quest for happiness goes through perfection. Generation Y has been raised in a technology oriented environment with televisions, the Internet and cell phones. This leads many to believe that generation Y would be more prompt to endorse new technologies in the future than their baby-boomer parents. Communication and social interactions are very important for this generation. The best example would be Facebook and how fast it spread across the world as an answer to an unfulfilled need.

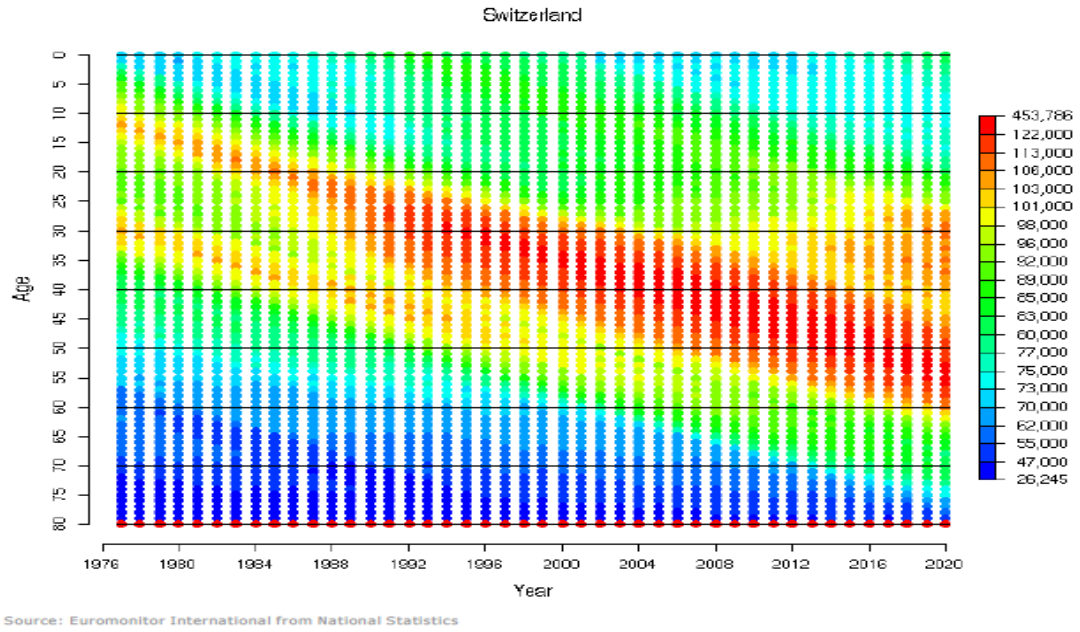
The environment in which generation Y has grown up is very different to that which their parents grew up in. Baby-boomers have had permanent jobs and experienced ideal working conditions; they are preparing for a golden retirement. These are only some of the myths known about the baby-boomer generation. We do not pretend to verify these myths, but one truth holds for everyone, times have changed. The baby-boomers have been raised in an environment of remaining growth. On the contrary, the baby-boomers' children, the current 20 to 30 year old generation, experiences instability, pessimism, competition and shifts in value. To make things worse, they will also be impacted by demographic trends that are spreading all over the developed world. Decreases in fertility rates below the replacement level and increases in the old-age dependency ratio are among these major trends. Well, the good news is that generation Y will live longer than they ever imagined. The bad news, paradoxically, is that generation Y is going to live longer than they ever imagined. The question as to whether this generation Y will apprehend these future challenges in time remains crucial in knowing which scenario will be played in the "Generation Y in 2030" première.

3 DEMOGRAPHIC CHALLENGES

3.1 SWITZERLAND

In Switzerland, the population is expected to increase at a slow positive rate with a downward trend. From a rate of 0.41% in the period 2005-2010, it will decrease to 0.26% between 2025 and 2030.[1] The high net migration movement is the main source of this growth. Indeed, Switzerland has a long history of immigration, and it widely contributes to the national population growth. The fertility rate of the immigrants in Switzerland is higher than the national one, smoothing the time frame of the demographic consequences.

Chart 1 Age structure of the population



Source: Euromonitor International from National Statistics

The age structure of Switzerland is changing and this trend will continue. Chart 1, represents the number of people at a specific age, for each age and over time, the national age modification is illustrated. In 2008, the youth aged between 20 and 30 are represented by the green points. The shifting of the red zone to the bottom right of the graph indicates an ageing of the population. By 2020, most of the people will be between 45 and 60 years. We can easily forecast that the 2040 scenario will be worse, with this category reaching the retirement age. Chart 2 illustrates the dependency ratio, which is the number of elderly people to the working age population between 15 and 65 years old, which proves this trend. Indeed, from 1990 to 2010, it increased from 21.3 to an expected 25.5.[2], meaning an increasing number of retired people rely on the workforce providing for them. The generation aged between 20 and 30 in 2009, will be between 40 and 50 years of age in 2030. According to the World Population Prospects, the dependency ratio for this generation will be 40.

1 Population Division of the Department of Economic and Social Affairs of the United Nations

2 Human Development Report 2009, UNDP

Chart 2 Switzerland Old Age Dependency Ratios

Year	2000	2005	2010	2015	2020	2025	2030
Old age dependency ratio	23	24	26	28	31	35	40

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision*, http://esa.un.org/unpp,

In addition, since 2002 a new blue zone has appeared at the top of the figure, showing the birth rate decreasing due to the downward change in the fertility rate and higher education, among others. The change in the age structure of Switzerland has been slightly slowed down by the net migratory movements due to most immigrants being of working age[3] and having a higher fertility rate than the indigenous inhabitants. Education is negatively correlated to explain the variable fertility rate. As mentioned, this generation pursues more higher education than those of the past. In addition, members of this generation are often single and live longer in their parents' home. Consequently, the fertility rate is not expected to return to the replacement rate of 2.1 in future years.[4]

The Swiss have fewer children, but they also experience one of the highest life expectancies in the world. In comparison to other countries, life expectancy is not only higher in Switzerland but its population also has better general health. In 2009, the average life expectancy has been calculated to be 81.8 years. We will gain three years of average life expectancy until 2030. If "Health equals Wealth" as, pointed out by Eberstadt and Groth (2007)[5], Switzerland has an invaluable asset in its pocket. Health could save Switzerland from recession or slow growth, by providing a competitive advantage. Its current demographic features and its solid pension system could place Switzerland in one of the best positions to manage demographic challenges.

3.2 GERMANY

The Federal Republic of Germany, from here on referred to as 'Germany', is Europe's largest economy and the second most populated nation after Russia. It is a key member of the continent's economic, political, and defence organizations.[6] "Modern-day Germany's population profile is perforce an accumulation of history. Its population structure now has been shaped by the country's unique and convulsive legacy from the 20th Century - a legacy inspirational in some episodes, shocking and terrible in many others."[7]

The Nazi era, on the one hand, left a very small number of survivors from the birth years 1943-47, and on the other hand, in the following post war period, it led to a mass migration into the former West Germany by ethnic German refugees from all over the Eastern European areas that had belonged to the Third Reich.[8] In the following years, West Germany saw more refugees enter the

3 The WDA –HSG Discussion Paper Series- Swizerland and its demography

4 Vital Statistics (VITSTAT), Annual Population Statistics (ESPOP)

5 Foreign Affairs, Healthy Europe, Nicholas Eberstadt and Hans Groth, June 2007

6 CIA official country profile Germany (2009)

7 Eberstadt and Groth (2008), *Unlocking the Value of Health (p.1)*

8 Eberstadt and Groth (2008), Unlocking the Value of Health (p.2)

country, for example, from "the Soviet Union's then-East German satellite state (the DDR), and another three-plus million from other then-Communist lands (the latter accommodated or financed under the framework of West Germany's pre-unification *Grundgesetz* and the special subsequent *Bundesvertriebenengesetz* of 1953)"[9], but also from non-German immigrants called 'Gastarbeiter', mainly in the 1950's and 1960's, which up until 2005 accumulated to roughly 8 million people. In 1989 and 1990 Germany experienced a significant milestone in its history when the 'Iron Curtain' finally fell and allowed East and West Germany to reunite again after more than 40 long years apart.

The ripple effects of this reunification can still be felt in German's current economy in terms of demographics as well as the financial effects. The demographic consequences include younger generations moving from the east to the west of Germany and leaving an older population behind. The financial consequences can be seen by the modernisation and integration of the eastern German economy - where unemployment still exceeds 30% in some municipalities – which continues to be a costly long-term process, with annual transfers from west to east amounting to roughly $80 billion.[10] During the post-war era and up until today, one other major factor silently influenced Germany's demographic profile more than most sudden historic events; the childbearing patterns of the post-war generations. Although there were a few brief years in the 1960's, with fertility rates of around 2.4, the general stealthy and ongoing trend in lower fertility meant that Germany's average fertility rate of 1.41 in the last 35 years was drastically below the required replacement rate of 2.1.[11]

Only due to the high net immigration that Germany experienced in the last five decades, was the country able to offset this low fertility rate. As net immigration has decreased due to more and more Germans leaving the country ('Auswanderer') and not enough foreigners replacing them[12], the predictions for the German population for the next 20 years are as follows:

Chart 3 German Population

Year	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Population in thousands	82 075	**82 409**	82 057	81 346	80 422	79 258	77 854

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp,

Not only is Germany's population expected to decrease drastically over the next 20 years, but the age structure of Germany is also changing, which aggravates the demographic trends. Chart 4 representing again the number of people at a specific age, for each age and over the time, illustrates this national age modification. In 2008, the young population aged between 20 and 30 are still represented by green points. The shifting of the red zone to the bottom right of the graph indicates again an ageing of the population. By 2020, most of the people will be between 50 and 60 years. We

9 Eberstadt and Groth (2008), Unlocking the Value of Health (p.2)

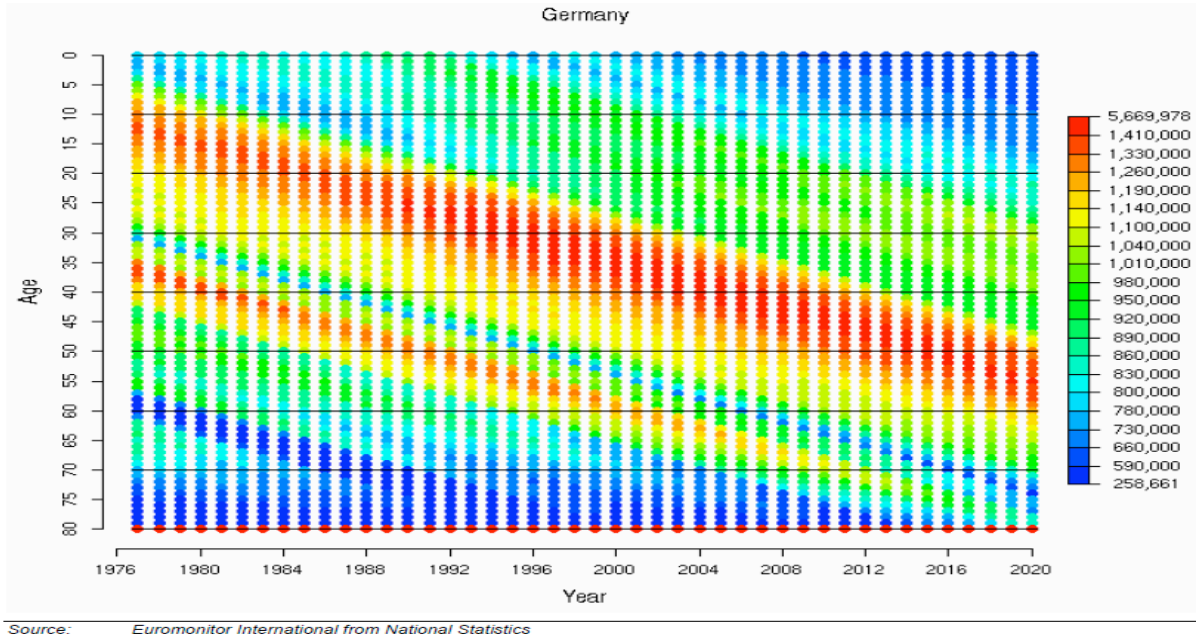
10 CIA official country profile Germany (2009)

11 Galasso (2006), The Political Future of Social Security in Aging Societies (p.105)

12 Klingholz (2009), Europe's Real Demographic Challenge (p.63)

can again deduct that in 2040 the picture will be even more dramatic, with the current generation Y reaching the retirement age.

Chart 4 Age structure of the population



Source: *Euromonitor International from National Statistics*

Chart 5 illustrates the dependency ratio for Germany and paints the same picture, meaning that an increasing number of retired people rely on the work force providing for them. In 2000, this ratio was still comparable to those of other European countries. But due to the unique demographic history of the German population, for generation Y, this ratio will double until 2030. That is indeed a very daunting prospect, as it indicates that nearly every two active members of the work force will have to support one pensioner, which is an extremely difficult situation to manage.

Chart 5 Germany Old Age Dependency Ratios

Year	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Old age dependency ratio	24	28	31	32	35	40	48

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision*, http://esa.un.org/unpp,

As Germans also have a very high average life expectancy of 79.9 years, which is believed to increase further, another main area of interest will be the healthcare system. As the German system is currently only ranked twenty-fifth in the world,[13] investments in this field are essential if Germany is to retain its competitive edge as a leading export nation. The welfare system as it stands today will also not be viable in the future and is in dire need of restructuring to prevent a drastic increase in poverty amongst elderly people in the future. Germany is facing one of its biggest challenges ever

13 World Health Organisation's ranking of the world's health systems

and taking its unique demographic profile, it could end up being an experimental 'test run' for the rest of Europe.

4 SURVEY

4.1 SURVEY DESCRIPTION

The survey was designed to explore the current perceptions and ideas of young people about demographic changes and their implications for Germany and Switzerland. It was therefore aimed at people between the age of 20 and 30 years, living in Germany or Switzerland, with the latter country being divided into a Swiss German and a Swiss French region, to get a more precise look at different cultural mindsets. We therefore created three surveys: a German, a Swiss German and a Swiss French survey, each in the respective language of German and French. Each country survey contained the exact same questions. Each question in the survey was carefully thought through and aimed at a particular set of knowledge we wanted to evoke from the participants. We confronted the participants with different types of questions, some of which were targeted at a specific knowledge of facts and others were more open ended to find out about the participants' opinions about and/or preferences of certain topics. The survey was split into two parts. The first part had the participants showing us their knowledge and perceptions without any influence or bias. The second part of the survey introduced statistical information and repeated similar types of questions as already seen in the first part of the survey. This was to see how the participants' perceptions would change when confronted with specific demographic facts and knowledge.

The survey was open for participants to be filled out during a 1.5-week period, to give as many people as possible the chance to complete the survey. Invitations to answer the survey were sent out via the University of St. Gallen email system, i.e., a Facebook group and a StudiVZ group, which is the German equivalent of Facebook. We finally sent the survey to a nursery HES named Ecole de la Source, based in Lausanne. The University email system proved to be very unhelpful in this matter as our email was scanned to be authorised by the University's administration for the duration of the 1.5 weeks of the survey being open and we ended up sending personal messages to the members of our Master's courses, rather than reaching all of the students currently studying at this University.

This led to the very unrepresentative number of 16 participants for the Swiss German survey. The German survey also showed a limited respondent rate of 51 participants starting the survey, but only 31 of them actually completing it. This number again is not as representative as we would have liked, but one has to acknowledge the rather limited pool of respondents available for the German survey due to the fact that the German co-author had not lived in Germany, but abroad for more than 6 years prior to this survey being sent. Fortunately, the Swiss French survey experienced a very high response rate of 241 participants starting the survey and 135 finishing it, which makes it a successful and representative survey.

4.2 SURVEY CONTENT AND INTENTIONS

The first part of the survey started with three questions, which were aimed both at the knowledge and perceptions of the participants. We wanted to know whether the participants knew what the average age and the legal retirement age are today in the respective countries, their perceptions of how the average age would change in the future and at what age they expected to retire at.

The next two sets of questions were aimed at how aware the participants were of demographic changes and the following consequences on the working environment. Participants had to rate whether they agreed or disagreed with two sets of statements, the first related to demography and the second related to the labour market in the respective countries.

Questions 6 and 7 related to financial issues. We asked whether or not participants expected to have more disposable income in the future than their parents now have. Then, question 7 followed this with a ranking of what the participants thought were the most important areas of their budget now and in 2030. This was intended to help us understand whether the participants realised what proportions of a person's budget are spent on which category and whether they could fully acknowledge how this changes with age.

Questions 8 and 9 were again a large set of statements that participants had to agree or disagree with. These statements were meant to find out what the participants would like to see in their future in terms of technology, science, knowledge transfer, nutrition, everyday life, healthcare, and other aspects of life. Even though not all of the statements may seem realistic in today's terms, it was interesting to see how people reacted to various suggestions about potential future products and services.

The second part of the survey started with a statement regarding the average age in the respective countries. We confronted the participants with the actual figures for today and the predictions for 2030 and asked whether the increase in average age would have an extensive effect on the respective country or not. If this question was answered with yes, we offered a follow up question that asked which three domains would be the most affected by this shift in average age; 10 domains and an 'other' option were provided including areas such as available income at retirement age, the competitiveness of the respective country, the decrease in the labour force, and others. This was to gain an insight into the participants' perception of the main future challenges they will be facing.

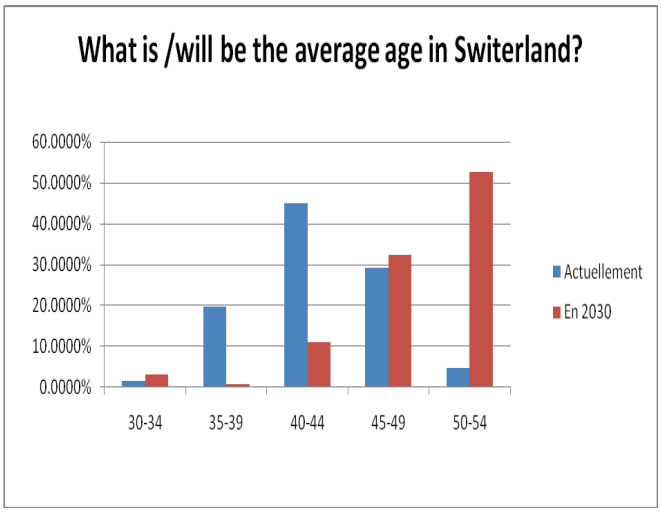
Question 12 gave the actual retirement age in the respective country rather than the legal retirement age and repeated the question as to when participants expected to retire. This was to find out whether the perceptions were changing due to the bias of the received information.

The next question was another set of statements, but this time participants had to rate the statements according to their positive or negative impact on the respective country. The statements were also more precise and some contained statistical information. This was to judge whether the participants were actually aware of the impact certain demographic trends and the following consequences had on their respective countries.

Question 14 asked which measures the respective countries should chose to best tackle these demographic changes. Participants had to provide the three most important actions in their eyes out of a given set of 14 options plus 'other'. This showed us what participants rated as being the important actions to counteract the negative demographic effects the respective countries are facing. The last question was an open-ended text box in which participants were to write their main wishes and worries for the year 2030, to see what their ideas and outlooks were for the future. The questionnaire ended with a set of demographic questions about the age, sex, occupation and nationality.

5 SURVEY ANALYSIS

5.1 SWITZERLAND



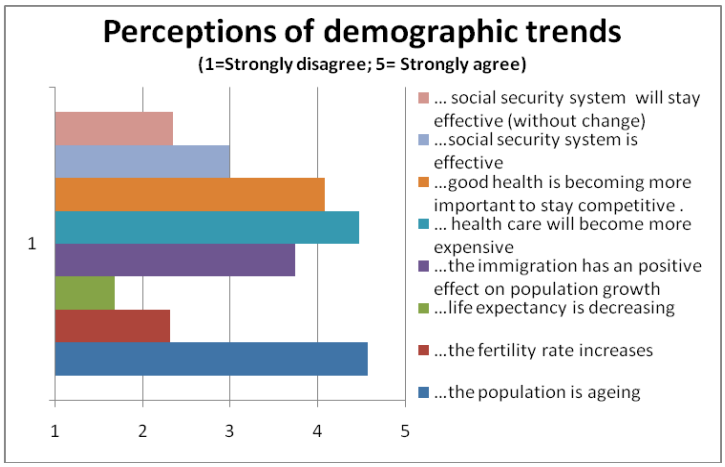
The first question evaluated generation Y's perceptions of the ageing trend in Switzerland. Around 45% of the participants have evaluated correctly that the Swiss average age is currently between 40 and 44. The exact average age is 41.9 for 2010. For the 2030 perspective, 52.7% of participants put the 2030 average age between 50 and 54. In reality, the average age in Switzerland is expected to increase to 48 by 2030.[14]

The second question evaluated the knowledge of the young generation regarding the legal retirement age. On average, the respondents have estimated the legal retirement age for men and women to be 65.03 and 63.41 years old respectively. The current retirement age in Switzerland is 65 and 64 years. More than 93% of the participants answered with 65 years and over for men. For the female legal retirement age, around 46% of the participants answered correctly and 51.5% underestimated the real age. Knowledge about the retirement age is better for men than for women. This could be due to the fact that the retirement age for women has increased from 62 to 64 years old in 1995, enabled by the 10th AVS revision.[15] It is interesting to see that the young generation does not want to work until the legal retirement age. On average, they want to retire at 63.3 years in Romandy and 64.85 years in the Swiss German part. This difference could be explained by the divergent cultural influence. Romandy is more influenced by France, which has one of the lowest legal and effective retirement ages in Europe with 60 and respectively 58.7 effective years. The Swiss German part is more influenced by Germany, where people effectively retire at 63.2 versus a 65-year-old legal threshold. An interesting and paradoxical point, proven in a prior study by Eberstadt and Groth (2007), is that living standards

14 Catalogue IUGM, Pension Switzerland

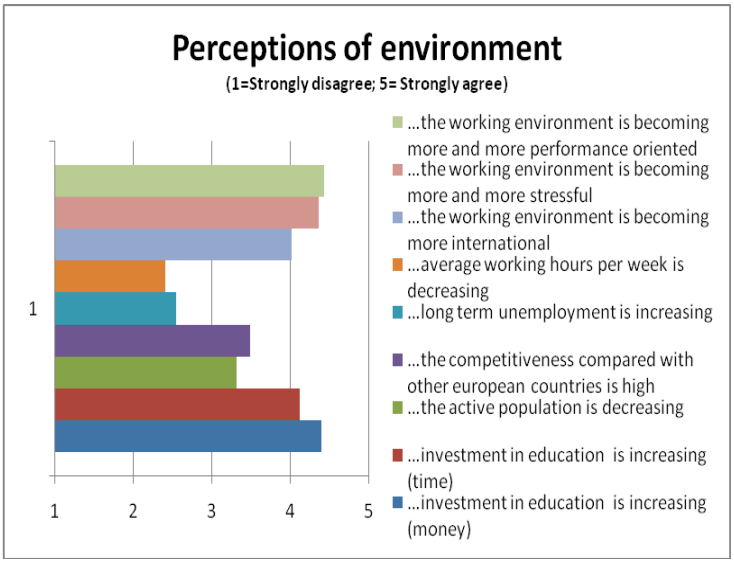
15 Ageing and Pension Reform around the world: Evidence from Eleven Countries, Giuliano Bonoli

have never been so high and people have never worked so little. Generation Y seems to confirm this theory.



Questions 4 and 5 are related to demographic trends and to society in general. Regarding the ageing of the populations, more than 93% of all respondents agreed or strongly agreed to the trend. The results for the life expectancy show 86% of people disagreed or strongly disagreed with the decrease of life expectancy. The fertility rate decrease has also been rejected by 65% of them. On the contrary, 16% agreed with the increase statement. The results of the survey show generation Y has a good knowledge of the demographic trends. The perceptions concerning the effect of immigration on the population growth shows 63% accepted the positive contributions, which is true for Switzerland. 25% of the sample was undecided about this statement. Health is widely accepted by 79% as a key determinant of national competitiveness. However, 93% see health as also being a costly expenditure and expect costs to increase. Therefore, we can infer that people are aware that health is a strategic asset with a high net present value but its costs are too high according to them. Social security in Switzerland is considered to be one of the best in the world. Surprisingly, 35% of the participants disagreed with the effectiveness, 34% agreed and the rest remained undecided.

An increase of investment in education, as well as in time and money was perceived by 94% and 83% of the participants respectively. Concerning the working environment, participants widely agreed at 82%, 89% and 92% respectively that it is becoming more international, more stressful and performance oriented. This indicates that the respondents are in a competitive environment, where productivity tends to be preferred to human values.



The question related to the budget showed interesting results. The categories food and beverages, health and housing were ranked as the three biggest expenditures in the budget with 28.4% in 2009 and 50.6% in 2030 by all the participants. A significant increase in the ranking of health from the sixth place in 2009 to the third place in 2030 was observed. The perception that health is becoming more expensive over the years, a result already found in

question 4, is then strengthened.

In question 7, a drastic decline in the education rank from 4 in 2009 to 7 in 2030 was also noticed. It reinforces the following assumptions: generation Y is more egocentric than the past generation, the family structure has changed and finally the fertility rate will experience a tremendous increase in the future. Indeed, in 2030, participants will be around 40 to 50 years old and will have a higher chance of being married, divorced and having children by then than the contrary. In the evaluation, it seems that the participants have not evaluated their 2030 budget by taking into account that they might have children to raise. The reason is not clear, but it could mean that they are either not thinking about having a family and if they want a few or no children at all or simply that they are aware of the low education costs in Switzerland.

Questions 8 and 9 attempted to answer how the participants envisage their future demands and needs. Regarding technology, 64% of the respondents were in favour of having wifi everywhere. However, 45% tend to reject having more technology in their everyday life, but 30% of the participants accept this idea. 76% strongly rejected the idea to have a robot in the future. Generation Y, which is the replacement generation, is technology driven. In other words, they will be quicker to adopt new technologies than their baby-boomer parents. This characteristic predicts that Western society will be increasingly technology oriented. The Internet will spread everywhere but technologies that exceed simple convenience and actually change the way people act will take more time to establish. Indeed, 58% of the respondents have rejected to live or work in a spatial environment where you can control your electronic equipment with your body. Regarding nutrition, a movement toward healthier food has been observed. Indeed, 85% of participants have expressed the wish to see an increase of healthy fast food, while 79% have rejected a rise in fast food itself. More bio products are wished for by 55% of participants, although 25% rejected it. Moreover, 56% of them want to see more regulations promoting healthy food in restaurants. In relation to science and health, we experienced a strong disagreement toward the use of pre-emptive medicines with 56% rejecting this idea. Genetics could be at the centre of health care in the future. Genome analysis changes diagnosis and expands knowledge about human diseases. However, the genetic code represents an ethical dilemma. In response to an identity card with an imprint of a person's genetic code, 65% conveyed disagreement. That health is crucial for a country is no longer a secret and we can fortunately see that the population of Switzerland has a chance to remain healthy and even increase the level of health. 74% of the young generation rejected the idea to do sport virtually. In combination to the rising concern regarding nutrition, it is likely that the health of the Swiss will improve. As mentioned, generation Y tends to be more concerned about environmental issues. Not surprisingly then, 82% of the respondents want to use electronic cars in the future. Online platforms for education are mitigated with 42% wanting them and 40% rejecting them. It shows that even with the expansion of the Internet, face-to-face learning remains important.

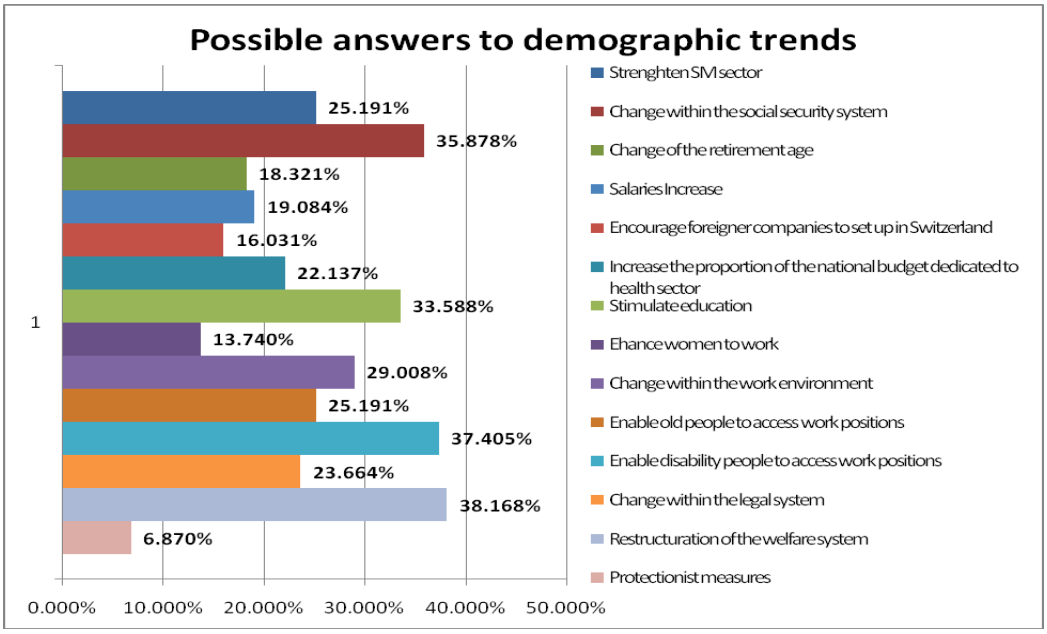
Out of all of the participants, 91% agreed that ageing will have wide-reaching consequences[16] and 84% of them want to see more elderly friendly products. It shows that this generation is aware of ageing and that some products and environments have not yet been adapted for elderly people. The ageing process and the increase of life expectancy are perceived to be negative for Switzerland by 84% and respectively 56%. These responses combined show that being old has very negative

[16] Question 12 Appendix

associations for the young generation. Immigration having a positive influence on the growth of population is linked with a positive impact for 61% of the participants. Generation Y is conscious that health is important for the future regarding demography. 78% consider that it has a positive impact on the country. However, 51% of them consider an increase of the national budget dedicated to health would be positive.

In relation to the impact of an ageing population, participants think that the disposable income, retirement age and the size of the active population will be the most impacted areas. Then, follows the sustainability of the social security system and the lack of adaptation of the environment for old people. In relation to the disposable income, it is interesting to point out that 49% of the respondents think they will have less disposable income than their parents have[17]. This is a rather pessimistic result, which seems to question whether or not we can naively have the same expectations as our parents. Life standards have increased tremendously fast in developed societies. Demography and its inherent challenges is a real threat to the so-called "usual growth".

The chart below pictures the actions that should, according to the young generation, be undertaken in Switzerland to oppose the negative demographic trends. The preferred actions are the restructuring of the welfare system, the increase of access to work for people with disabilities. The last proposition has a clear link with the current status of the social security system. Indeed, in Switzerland, the first pillar is represented by the AVS (survivor's insurance) and the AI (invalidity insurance). The Confédération finances 37% of the AI.[18] Although it was originally created to support invalids and disabled people, the change within the society has increased the burden on this insurance. Among others, psychological problems justifying the obtainment of AI coverage have increased from 27% to 40% between 1997 and 2009[19]. The causes of which include healthcare, societal changes, work pressure, changes in family structures and difficulties related to immigration.



[17] Question 6 Appendix
[18] Overview of the Swiss social security, Federal Insurance Office, Swiss Confederation
[19] Disability Insurance Feels the strain, 14/09/2009, swissinfo.ch

The next preferred actions come through a change within the social security system and an enhancement in education.

Regarding the desires and concerns expressed by generation Y for 2030, several streams have been observed. Work concerns have included worries about job security and the balance between family and work as reflected in a desire to expand part-time possibilities as well as creating a scheme helping women to work and have a family at the same time. Concerns about the retirement age were expressed several times, as well as worries about the sustainability of the pension system. The hope to have an increase in disposable income was also expressed. The participants who answered this question also generally conveyed environmental concerns. Health concerns were also evident. To sum up, participants believe that health should be promoted without having to consider economic issues. Moreover, the inadequacy in the number of places in elderly homes as well as the number of doctors and nurses were pointed out. Regarding the young generation, it was felt that it should be better supported from an economic point of view. Education should be expanded and offer more diversity at several levels. Concerns about the ageing population included the view that the elderly should be better integrated in active and social life and that their independence should be ensured.

The average age of the participants was exactly 22; 23% were male and 77% were female. Over 90% of respondents were students.

5.2 RECOMMENDATIONS FOR SWITZERLAND

As actions have to be undertaken, it remains to decide which of them Switzerland should put forward. The results of the survey together with some specific aspects concerning Switzerland lead us to provide the following recommendations.

Switzerland should provide opportunities for older people to work. “Old & Active” is possible for Switzerland. Thanks to the health of its inhabitants and its high life expectancy, Switzerland could eventually have one of the greatest competitive advantages to face the demographic challenges. Incentives to hire older workers should be increased. Regarding legislation, flexibility in the work place should be protected, as well as a phased retirement. Social activities could be also an interesting way to channel older people to work. We recommend that better incentives for companies to become learning corporations should be provided. Knowledge is important and it should be enhanced at all levels. Constantly updating technology and skills as well as the learning of new skills could help old people to stay active for longer. Indeed, the gap between younger and older people regarding technology can be large. In the short term, the baby-boomers should be offered new opportunities to enhance their technological knowledge. In the long term, we believe that generation Y, who are “digital natives”, will be more keen to update their knowledge once they are working. Inventions such as an integrated electronic system[20] set up in the houses of old people could eventually assist in the ageing process. Assuming technology will have an increasing importance in our everyday lives, it is important to integrate innovations appropriately.

Knowledge and experience are valuable and it is a waste of resources if it is not used correctly. In Africa and Asia, contrary to Europe, old people are considered wise. Integrating old people in fields such as consulting could assert a real value to the experience of older workers. Having diversity in the

[20] System where electronic equipment could communicate with each other

age of employees in corporations could help to assure growth. Indeed, the young and old complement each other with the young standing for vitality and the old for knowledge and experience. The more diversity, the better the chance to take advantage of the ageing trend. The working environment is also important in the process of ageing. According to the results of our survey, the working environment is becoming more international, more stressful and more performance oriented. The consequences of this on demographics are unclear but it remains that the current working environment does not help people to work longer. Indeed, instead of a cooperative environment, intergenerational competition at work has taken place, wasting time as well as the energy of older workers. In Western countries, one generally reaches the peak of one's career at 50. Rather than associating ageing with wisdom, this is perceived as a decline leading to an unproductive period of life. The question therefore is if work values as well as personal values could only be shaken up and transcend the eternal youth fantasy? To promote the graying process positively could help people to cross the bridge between an ominous destiny to one with opportunities.

The increase of the retirement age could help to decrease the future pressure that the social security system will face. Switzerland already experiences a high effective retirement age,[21] which is good but considering its national health, an increase could be feasible. It is very likely that the legal retirement age for women will increase to the level for men in the coming years. In reference to the "dolce vita" phenomenon, this was confirmed in a survey carried out as part of a study by Eberstadt and Groth (2007). Generation Y wants to work even less than the legal retirement age. Actively promoting ageing in the society would eventually make people keener to work. Another way to protect the pension funds against the ageing phenomenon could be the possibility of using the financial market to ensure that profitability will match future liabilities. The longevity risk represents the risk that a pension fund effectively pays more than its expected liabilities. From the transfer to reinsurers, and over a distribution to capital markets, as well as hedging possibilities, the longevity risk can also be traded.[22]

Switzerland as an immigration country sees its ageing of the population slowing down. However, immigration is not always positive as pointed out in the article from Eberstadt and Groth (2007). As stated before, immigration is one of the main causes cited for the increase of psychological problems related to the disability insurance. An increase in work participation of disabled people has been chosen by generation Y as the preferred measure. Changes within the work environment and integration measures could lead to a decrease of the AI expenses.

Businesses that enhance the possibilities for women to work while having a family and an improved integration of immigrants should be developed.

Advances in technology and science will play a role in providing economies of scale in health as well as an improvement of health care. According to our survey, health is expensive and improving its cost efficiency would be a very welcome measure. In our everyday life, technology has to be more adapted for elderly people. Indeed, the survey conveys that elderly friendly products are desired. Old

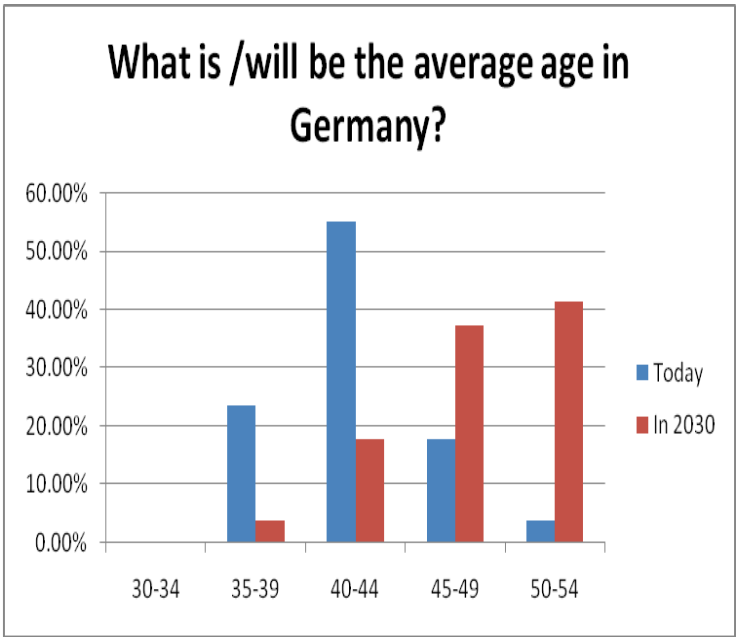
21 See Appendix for numbers

22 Swiss Re sigma study : Annuities - a private solution to longevity risk.

people's homes and tailoring architecture for the elderly provide real opportunities regarding the population's level of income and its standard of living.

Education has to be improved to better fit Switzerland's needs. Indeed, according to the latest report of the global competitiveness index recently produced by the World Economic Forum, one of the biggest problems in doing business is the inadequacy of educated workers.

5.3 GERMANY

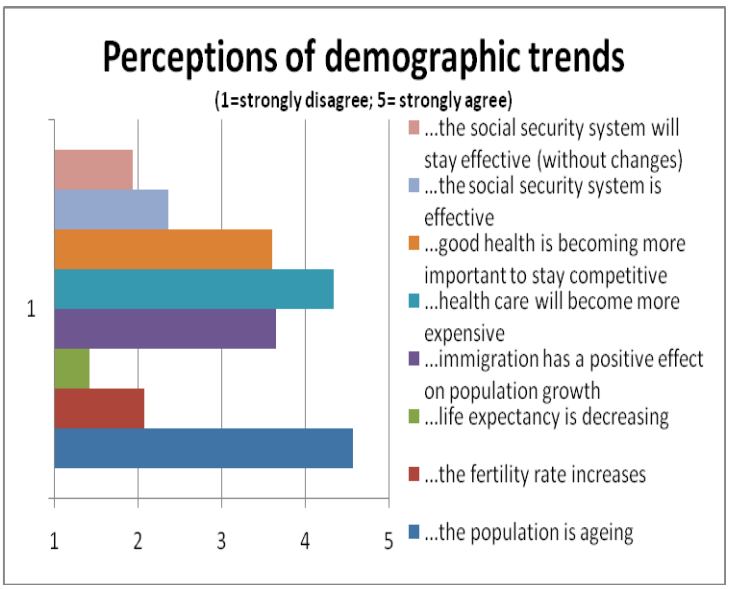


The first question concerned the average age in Germany. 55% of the participants knew that the average age in Germany lies between 40 and 44 years, although 24% thought it was between 35 and 39. For the second part of the question, 37% of the respondents knew that the average age in Germany in 2030 will be between 45 and 49, although 41% thought it would be between 50 and 54 years. This shows that although most respondents were aware of the actual figures, a relatively large proportion first underestimated and then overestimated the results.

Regarding the second question, 43% of the participants knew that the German legal retirement age currently is 65 years. 38% of respondents thought that the German retirement age was 67, which is not the case so far. The German government announced in 2006 that it would gradually adjust the retirement age from 65 to 67 from 2012;[23] the latter group of participants must have confused this fact with the actual legal retirement age.

When asked at what age participants thought they were actually going to retire, the answers ranged from 50 to 75 years. Over 60% of participants thought they would retire at or above the legal retirement age of 67, and nearly 30% of respondents thought they would retire at 70 or above. This seems to indicate that the participants appear to be aware of the need for a prolonged active working life and ranked their answers accordingly.

[23] Article of the 'Neue Zürcher Zeitung' 29.11.2006

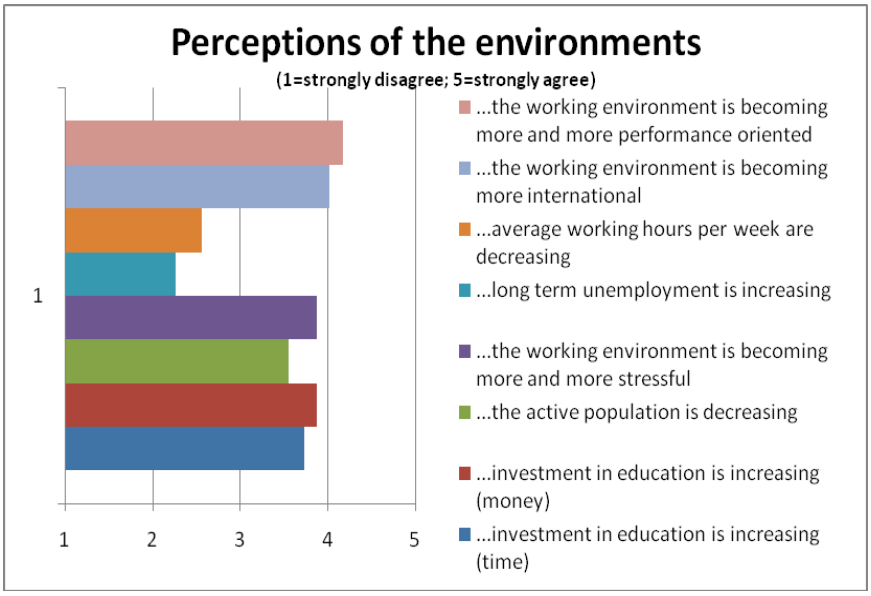


The next part of the survey concentrated on statements relating to demography and whether the respondents agreed or disagreed. 91% of respondents agreed with the statement that Germany is becoming older; no one disagreed and the remaining 9% were undecided. This proves that the participants acknowledge that Germany's society is ageing. 73% of the respondents think that the fertility rate is not increasing and only 16% of the respondents seem to think that the fertility rate could increase, which indeed paints a negative picture for Germany. As the participants who filled out this survey are the ones who have an influence on the fertility rate in the future, we can infer that the average participant is not likely to have more than two children.

93% of respondents are sure that the average life expectancy in Germany will definitely increase, showing good faith in the healthcare system and healthier lifestyle trends. 60% agreed that immigration has a positive effect on population growth, which holds true for the last decades up to the year 2003 when the population was decreasing for the first time since the Second World War.[24] 89% of respondents believed that the healthcare system is getting more expensive and 56% agreed that health is becoming more and more important for the competitiveness of the country. However, 31% of participants were undecided on this last statement, which shows that many participants have not yet confronted themselves with this fact and are therefore unsure as to whether it holds true or not. 62% of respondents are convinced that the pension system in Germany is not effective today and 78% state that the current pension system will not be viable in the future, which shows just how little faith the current generation has in the systems currently in place.

[24] Klingholz (2009), Europe's Real Demographic Challenge (p.63)

The second part of the statements focused more on the labour market. An increase of investment in education, and in time and money, is perceived by 64% and 76% of the participants respectively. This shows that the respondents were aware of the increased trends in higher education and the importance of education to the individual. 61% of respondents agreed that the size of the workforce is decreasing, acknowledging the current demographic trends. Only 54% of participants agreed that Germany's competitiveness is high compared to other European countries and 76% believe that long term unemployment will increase in the future. This shows low faith in the countries competitive resources and a negative outlook for Germany's performance in the international arena. A common feature that can be observed among German nationals is that they have a very negative outlook regarding their country, the world and life in general when compared to other European countries.[25] Even though Germany ranks thirty-seventh out of 178 surveyed countries in international happiness studies, the Germans always seem to find something to complain about and sometimes it feels like complaining is a national German pastime.[26] Regarding the working environment, participants widely agreed at 88%, 71% and 81% that it is becoming more international, more stressful and more performance oriented. Also, 56% believe that the average weekly working hours are likely to increase. All this confirms a relatively bleak outlook for the working life of the participants.



61% of respondents thought that they will have more disposable income in the future than their parents currently have. Regarding personal spending, we asked participants to rate the different areas of their budget according to importance. We found the three most important areas of the budget today to be living expenses with 82%, education with 64% and nutrition with 52%. In 2030, this shifted to living expenses with 82%, nutrition with 49% and leisure and healthcare being relatively equal with 39% and 37% respectively. We can hereby note that the perceived spending on leisure in this case rose by 44% and perceived spending on healthcare even increased by 200%. Another interesting observation was that perceived spending on education fell drastically by more than 70%, which indicated that the respondents tended to consider only investments in their own education and neglected to acknowledge that they will very likely have to pay for their children's education in the future.

In question 8, 75% and 63% of respondents respectively were in favour of having wifi everywhere and more technology in their everyday life. However, 59% strongly rejected the idea of having a

25 Blanchflower (2007) Hypertension and Happiness across Nations

26 Spiegel online (20.02.2007) Zufriedenheitsstudien

robot in the future. 50% of the respondents were interested in an interactive operating and projection system replacing their computer, showing that the German generation Y is very much technology driven, albeit within limits. Concerning nutrition, a movement toward healthier food can be observed. 66% of participants expressed the wish to see an increase in healthy fast food, while 88% opposed a rise in fast food itself. 53% of participants wished to have more bio products, although 28% rejected it. Moreover, 63% of respondents want to see more regulations promoting healthy food. Regarding health and science, 88% of participants strongly rejected the idea of doing sport virtually. In combination to concerns related to healthy nutrition, the general health of the young German generation is very likely to continue increasing which could improve the country's competitive stance. As health becomes more and more important for Germany, it will be a strong asset in the future. Regarding the use of pre-emptive medicines, as many respondents were undecided as against or for it. 66% of respondents, however, were opposed to the idea of an identity card with an imprint of one's personal genetic code, as genetic research and practice remains a very controversial issue. Concerning generation Y's interest in environmental issues, 60% of participants want to use electronic cars in the future. Online platforms for education were desired by 44% of respondents, although 38% were opposed to this idea. This again proves that face-to-face learning remains important for generation Y. In comparison to the results in Germany, it seems like Swiss people are more concerned about health and food than technology.

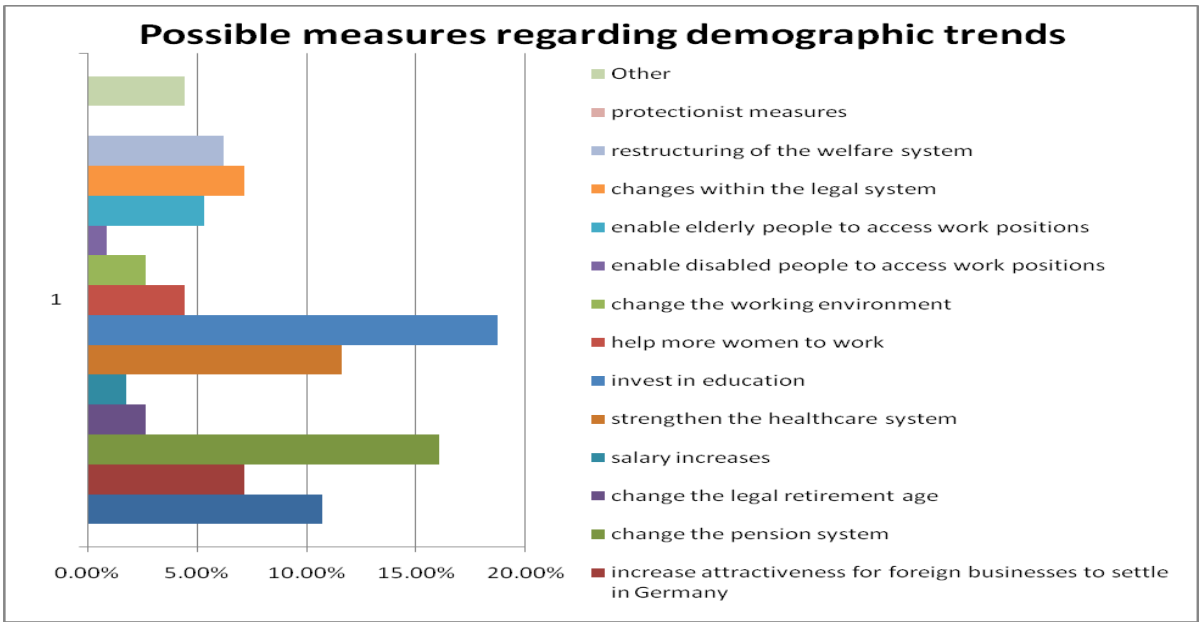
91% of participants agreed that ageing will have wide-reaching consequences and when following this question with an inquiry as to which areas in the German economy would be most affected by this change, the three most cited answers were: available money at retirement age, the sustainability of the pension system and the retirement age itself. The shrinking workforce and Germany's competitiveness closely followed these. We see that generation Y is more preoccupied with personal matters before the welfare of the country among other factors.

When confronted with the actual effective retirement age of 63.1 and 63 years for men and women respectively, only 55% of respondents now stated that they would retire at or above the legal retirement age of 67, and 36% of respondents now believe that they would retire at 70 or above. An interesting observation was that the average predicted retirement age provided by participants in question three was 66.2 years and this number has now decreased to 65.7 years. This indicates that the participants were influenced by the actual low retirement age figures provided in this question.

In the next question, participants ranked the positive or negative impact on Germany of the statements given. 81% of participants realised that the current fertility rate of 1.41 children per woman has a negative effect on Germany, and 77% of respondents predicted negative effects of the combination of a stagnant immigration rate and a negative population growth in Germany. 48% believed that the high life expectancy of 79.9 years, which is said to be increasing, has negative effects on Germany. More than 35% of respondents think that an increase of the national budget dedicated to health will have a neutral effect on Germany and 42% even think it will have a negative effect. Yet 56% of participants believe that "health remaining a strong asset for Germany" has a positive effect on the country. This is somewhat contradictory and infers that the participants either did not fully grasp the questions asked or did not think about them carefully enough. 94% and 87% of the participants respectively expressed that a decrease in the workforce and an increase in the proportion of elderly people in the population will have negative effects on Germany. However, 77% of respondents believe that an increase in international trade will benefit Germany, showing that the

participants are aware of Germany's strong export qualities and that they have faith in Germany's potential to use these international opportunities in the future.

Then, participants were asked to choose the three most important measures Germany could take to counteract the negative demographic trends it is facing. As can be seen in the chart below, the three most promising actions out of 11 options were: higher investment in education, restructuring of the pension system and strengthening the healthcare system. Other important measures mentioned were strengthening medium-sized enterprises and supporting families more intensively.



Tied in with these measures, we ended the survey with an open-ended text box asking respondents to write their main wishes and worries for the year 2030. Their wishes included a happy family, higher standards of living, a more eco-friendly lifestyle, a stable income and good health. Concerning their worries, these included poverty at the retirement age due to a failing pension system, extensive medical and healthcare costs, long term unemployment, the repercussions of the financial crisis and future possible crises and even natural disasters caused by global warming; this is another partial side effect of the demographic trends across the world in the last 200 years and also shows again generation Y's concerns regarding environmental issues.

The average age of the participants was exactly 23; 45% were male and 55% were female. Over 80% of respondents were students and all participants were of German nationality.

5.4 Recommendations for Germany

Germany is in a deep crisis and the ongoing demographic changes will continue to aggravate its problems. To improve Germany's situation, many measures need to be taken, and soon!

Germany's main problems include the fact that the demographic trends will drastically reduce the current workforce, and that the old-age dependency ratio is predicted to increase dramatically in the next few years. These two combined factors pose a large threat: the current pension system is likely to collapse, the healthcare system will come under enormous pressure to provide for the increased elderly population, the education system compared to other countries is performing poorly (PISA,

etc.) and the country's competitiveness in the international arena will be challenged. As factors like the fertility rate and immigration are difficult to influence and control we will neglect them in the recommendations.

The welfare state in Germany, one of the oldest in the world,[27] is in dire need of restructuring. The pension system will need to be reconsidered to prevent impoverishment of the elderly demographic of the population. Investments in healthcare will prove extremely important to retain Germany's good health, which is becoming more and more important as a national asset. Only with good health can Germany unlock the true potential of elderly people contributing to the workforce. By additionally creating work that is more elderly friendly, we can use the knowledge and experience of the elderly, which are invaluable in strengthening the country's capabilities and helping it to remain competitive in tomorrow's business world. Furthermore, extending the retirement age potentially relieves some of the burden of the pension system. The next issue is education. Germany needs to invest in its education system now before it is too late. High quality vocational training should remain a great national asset and the individual's investment of time and money in higher education is predicted to increase. However, Germany needs to continue investing to retain its relative level of education in the worldwide arena. Furthermore, the decrease in the workforce will need to be substituted by higher productivity to retain Germany's competitive position in the world. Knowledge and life-long learning are the keys to this productivity and its ensuing wealth. To further strengthen the German economy, we should also encourage more women to enter the workforce, which will be complemented by better support for families to relieve pressure on them. Additionally, medium-sized enterprises need to be supported, as they represent 99,7% of all turnover taxpaying businesses in Germany. They employ 65,9% of the work force, produce 38,3% of the total annual revenue and educate 83% of all apprentices/trainees in Germany.[28] Therefore, they are the backbone of the German economy and an invaluable asset to the country.

If Germany starts implementing these measures now, it will have a better chance of managing this most difficult situation in the future. Not all actions are certain to produce the desired effects and many of the trends Germany is facing are irreversible; but with blood, sweat and tears Germany will be able to face these daunting challenges and possibly even transform them into opportunities. Nevertheless, Germany will be the first European country to be actively confronted with the extreme type of demographic population structure described in the paper. Hence, whatever actions Germany will take in the future, it will most likely act as an experimental case for Europe, which will be able to benefit from the lessons learned in Germany.

27 Galasso (2006), The Political Future of Social Security in Aging Societies (p.97)

28 Schlüsselzahlen des Mittelstands in Deutschland 2007/2008

6 CONCLUSION

Comparing both countries we find many similarities, yet Germany seems to be several years ahead in the ageing process. Switzerland benefits from higher relative levels of immigration than Germany, as well as better levels of health and life expectancy. The Swiss pension system is better adapted to face the country's demographic challenges than the German one and its effective retirement age is closer to the national legal limit than in Germany. However, the working environments are very similar in both countries and we can observe that they are becoming more stressful, performance oriented and more international. Finally, in both countries we notice an increase of investment in education, both in time and money.

The generation Y participants of our survey seemed to be aware of the main demographic challenges, and chose possible measures for Germany and Switzerland to counteract the negative demographic trends. Yet somehow there appeared to be a feeling of apathy and inertia towards the proposed measures. The respondents were aware of, and named possible actions, but reviewing the survey showed that most did not really take these measures to heart and sometimes their answers did not show a deeper reflection on the future at all. Many responses fully confirmed the general perception of generation Y, discussed in the demographic literature, but nevertheless some answers were surprising and showed true passion.

Regarding future business models, we believe that technology will come to the forefront of the business world, potentially providing innovations to help elderly people in their everyday life. Technology together with science will also improve the health system's efficiency in terms of quality of service delivered and reductions in costs. Health will be one of the most important assets in the future for the two countries: "health is wealth"[29]. In general, the business world has to adapt to the needs of the elderly and create products accordingly. Taking into account the results of our survey we found that societal values are shifting. Generation Y does not cherish the same values as their parents and old age no longer merits respect; it is a state of being that is feared by the young generation. Being old is associated with illness, no purpose in life, loneliness and death. However, with age comes knowledge and experience, which is very valuable if used correctly. Currently, the working environment disregards elderly people, rather than enabling an intergenerational knowledge transfer. Tapping into the yet unused potential of the elderly in the working environment would be a great opportunity to maximize national resources in human capital, which will lead to higher productivity and wealth. Furthermore, Germany and Switzerland should focus on their other core capabilities to strengthen their competitive positions in the business arena. Only through growth can both countries effectively counteract the negative demographic trends and avoid missing the boat.

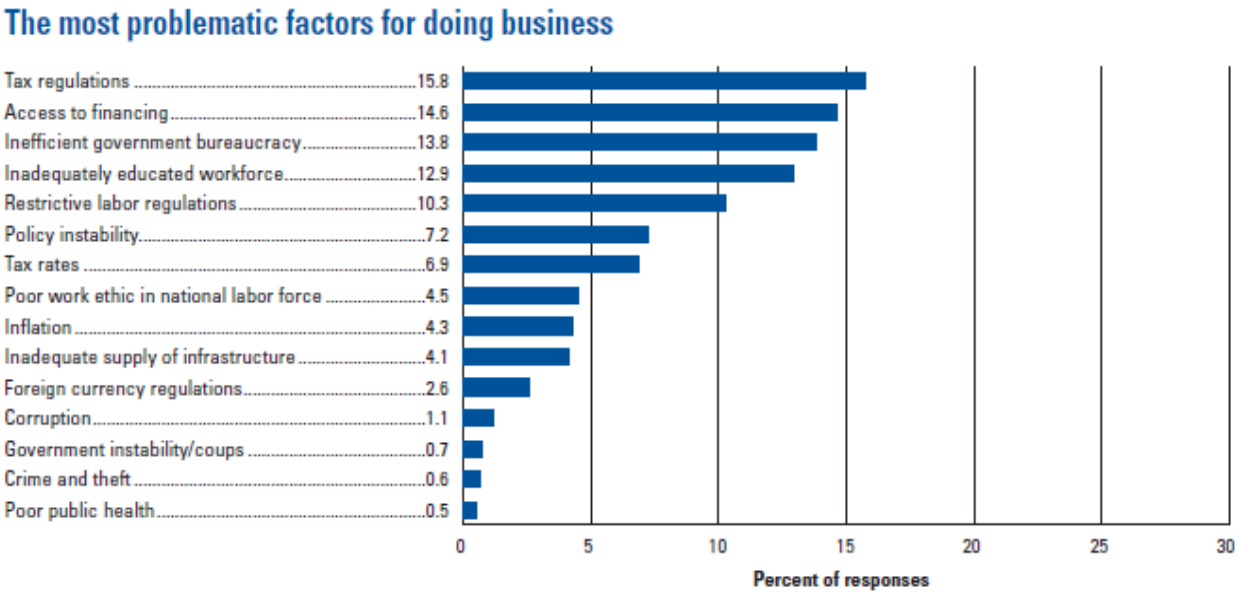
[29] Foreign Affairs, Healthy Europe, Nicholas Eberstadt and Hans Groth, June 2007

7 APPENDIX

7.1 GRAPHS

	Rank (out of 133)	Score (1–7)
GCI 2009–2010	**1**	**5.6**
GCI 2008–2009 (out of 134)	2	5.6
GCI 2007–2008 (out of 131)	2	5.6
Basic requirements	**3**	**6.0**
1st pillar: Institutions	8	5.9
2nd pillar: Infrastructure	5	6.3
3rd pillar: Macroeconomic stability	17	5.6
4th pillar: Health and primary education	21	6.1
Efficiency enhancers	**3**	**5.4**
5th pillar: Higher education and training	6	5.6
6th pillar: Goods market efficiency	5	5.2
7th pillar: Labor market efficiency	2	5.8
8th pillar: Financial market sophistication	14	5.1
9th pillar: Technological readiness	3	6.0
10th pillar: Market size	36	4.6
Innovation and sophistication factors	**3**	**5.7**
11th pillar: Business sophistication	3	5.8
12th pillar: Innovation	2	5.6

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision*, http://esa.un.org/unpp



Note: From a list of 15 factors, respondents were asked to select the five most problematic for doing business in their country/economy and to rank them between 1 (most problematic) and 5. The bars in the figure show the responses weighted according to their rankings.

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision*, http://esa.un.org/unpp,

7.2 SURVEY

Question 1

What is the average age in XX?	In 2009	In 2030
30-34		
35-39		
40-44		
45-49		
50-54		

Question 2

What is the legal retirement age for women?
What is the legal retirement age for men?

Question 3

At which age do you want to retire?

Question 4

In XX…	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
…the population is ageing					
…the fertility rate increases					
…life expectancy is decreasing					
…the immigration has a positive effect on population growth					
… health care will become more expensive					
…good health is becoming more important to stay competitive					
…social security system is effective					
… social security system will stay effective (without change)					

Question 5

In XX…	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
…investment in education is increasing (money)					
…investment in education is increasing (time)					
…the active population is decreasing					
…the competitiveness compared with other European countries is high					
…long term unemployment is increasing					
…average working hours per week is decreasing					
…the working environment is becoming more international					
…the working environment is becoming more and more stressful					
…the working environment is becoming more performance oriented					

Question 6

Do you think you will have more disposable income than our parents have? (yes or no)?

Question 7

Rank from 1 for the highest expenses to 11 the lowest, the proportion each category represents in your budget		
Expenditure on	In 2009	In 2030
Leisure and recreation		
Education		
Housing		
Health goods and services		
Transport		
Clothing and footwear		
Food and non-alcoholic beverages		
Alcoholic beverages and tobacco		
Communications		
Hotels and restaurants		
Other		

Questions 8 & 9

Do you want….	Completely Agree	Agree	Neutral	Disagree	Completely Disagree
…more technology in your everyday life 2030					
…wifi everywhere is 2030					
…a robot in 2030					
… more bio products in 2030?					
…to use a chocolate inhaler, in other words taste without sugar or calories.					
…more fast food in 2030					
…healthier fast food in 2030					
…more legal frameworks promoting healthy food in the restaurants in 2030					
…to use mainly e-books in 2030					
…to have an electronic newspaper in 2030					
..to use e-paper (electronic paper) instead of classic paper					
…to watch 3D movies at home					
…work/live in an environment where you can control your electronic environment with your body (cf. minority report)					
…advertisment to be more controlled					
…to have clothes that are self washable and do not need to be ironed					
…to do virtual sports in 2030					
…to use online educative platforms in 2030					
…to use electronic cars in 2030					
…to have a worlwide passport in 2030					
…to have your genetic code on your ID in 2030					
…know in advance your genetic sensitivity to diseases					
…to use pre-emptive medicines					
…to use an integrated system enabling electronic equipment to communicate among each other (oven, fridge, TV, light, etc) in 2030					
…to use mainly TV or Internet to buy food in 2030					
…to use mainly TV or Internet to buy clothes in 2030					
…to use network enabling to access video on demand instead of physical support like DVD in 2030					
…to have more products oriented toward old people in 2030					

Question 10

The average age in … is … and is expected to increase to …in 2030. Do you think it will have an impact?

Question 11

What will be most impacted by the ageing of the population? (Pick 3)

	Disposable Income at retirement age
	Competitiveness of Switzerland
	Retirement age
	Inadaptation of environment for old people
	Size of the active population
	Sustainability of the social security system
	Appearance of new products/businesses
	Level of Income
	Change in personal values
	Increase of social inequality

Question 12

The retirement age is …for men and…for women. When do you want to retire?

Question 13

In XX..	Very positive impact	Positive impact	Neutral impact	Negative impact	Very negative impact
…the fertility rate is xx and is expected to decrease					
…the average life expectancy is xx and is expected to increase					
…the active population is decreasing					
…the ratio of old age dependency is increasing					
…immigration has a positive impact on the population growth					
…the proportion of the national budget dedicated to the health system is increasing					
…a good national health is a strength for the future					

Question 14

Which measures could be undertaken in Switzerland to face national demographic trends? Pick 3

	Strengthen the PME secot
	Change within the social security system
	Change of the legal retirement age
	Increase of incomes
	Stimulate education
	Enhance that women can work
	Encourage setting up of foreign companies
	Increase the national budget proportion dedicated to health
	Change within the work environment
	Enable old people to access work positions
	Enable people with disabilities to access work positions
	Change within the legal system (taxes etc.)
	Restructuring of the welfare system
	Protectionist measures

Question 15

What are your main concerns and desires for 2030?

http://catalogue.iugm.qc.ca/GEIDEFile/pension_switzerland.PDF?Archive=193881391106&File=pension_switzerland_PDF

www.swissinfo.ch

Sources: Vital Statistics (VITSTAT), Annual Population Statistics (ESPOP)

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Swiss Info: www.swissinfo.ch

Swiss Statistics: http://www.bfs.admin.ch/bfs/portal/en/index/themen/01.html

Swiss Re: http://www.swissre.com/

Universität St.Gallen

Hochschule für Wirtschafts-, Rechts- und Sozialwissenschaften

(HSG)

Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 7

Prepare a submission to the Walder Stiftung Award "Leben und Wohnen im Alter" ("Life and living in old age") by developing a business concept as to how elderly Swiss citizens could live in an innovative and stimulating environment.

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November 2009

St. Gallen University

Megatrend "Global Demographic Change"

Dr. Hans Groth

Abstract

This paper describes a concrete micro-level solution to the challenges brought to us by the "Global Demographic Change". The project *Homes Connected* is a social enterprise which offers a sustainable way of dealing with the future associated issues of "living in old age". In essence a housing community, *Homes Connected* has found an innovative way of creating immense social interaction among its inhabitants, thereby solving many problems at once. The paper is structured the following way. Sections 1-3 provide general background information on demographic change in Switzerland and especially allude to the situation and problems of the elderly. Section 4 consists of the business plan, in which the *Homes Connected* project is introduced and described as a (social) business. Section 5 gives a short conclusion.

Table of Contents

1. Introduction

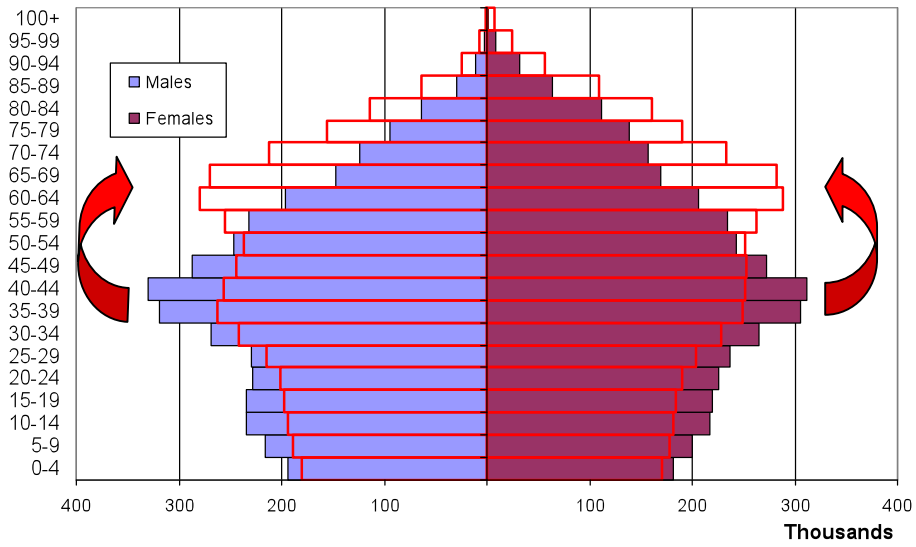
As part of our course "Megatrend 'Global Demographic Change': Tackling Business and Society Challenges in 2030 and beyond" at the University of St. Gallen, we are proposing a submission to the Walder Stiftung Award "Leben und Wohnen im Alter" by developing a business concept as to how elderly Swiss citizens could live in an innovative and stimulating environment. We will set up our idea as a social business. Our model will be interesting for both investors and for society as a whole.

2. Background

2.1. Problem setting

Switzerland, as most European countries today, is confronted with an ageing society (OECD). The percentage of people above 65 years increased in the last eight years from 15.4% in 2000 to 16.6% in the year 2008, while simultaneously the percentage of children and youth below age 20 decreased from 23.1% to 21.1%[1]. According to a scenario from the Swiss "Bundesamt für Statistik", the percentage of people above 65 is expected to rise up to 24% until the year 2030[2].

The following chart shows the situation in year 2005[3] and a projection for year 2035.



[1] Bundesamt für Statistik Schweiz http://www.bfs.admin.ch/bfs/portal/de/index/themen/01/02/blank/dos/le_portrait_demographique/introduction.html

[2] Rolf Ribi: Die Schweiz wird älter, http://www.revue.ch/gesellschaft, 21. October 2009

[3] Nicholas Eberstadt, Demographic Profiles in Contrast: Health, Aging and Development in Russia, Switzerland and USA, September 2009

This change in demography requires accompanying measures to deal with the many changes to elderly people's lives such as work, pension funds (AHV), mobility, housing and health, etc[4].

We see the creation of suitable living spaces as a means to take appropriate measures to improve elderly people's lives.

2.2. Needs of elderly people

Official empirical data support the thesis that men and women today do not only live longer, but also enjoy a life without physical restrictions for longer (BAF)[5]. Elderly people are not just only weak and fragile, but many of them are going through a stage in life that has its own value and still holds many possibilities. The ageing process varies vastly between different individuals[6].

The federal council of Switzerland has identified five main areas that concern elderly people, namely health care, civil engagement and social participation, mobility and housing, work and retirement and the economic situation.

This section shortly describes these five areas.

2.2.1. Health care

The above-mentioned trend towards increasingly active and healthy elderly people has an impact on the needed health care. There are two situations that need to be considered[7]:

1. Due to better living conditions and stronger health, the number of people in need of intense health care does not grow as fast as the number of elderly people in general
2. Longer life expectancy and better medical care means a long period of disability and need for medical care for a minority of people.

This raises two main questions: Who provides this medical care and who pays for this?

For the people that still live at home (the group of people we look at in this paper) the responsibility of the provision of medical care lays with the Spitex. The organization collaborates with institutions such as "Pro Senectute" and the "Red Cross" and numerous volunteers provide excellent medical service for elderly people still living at home.

If elderly people's income is not big enough to pay for the necessary medical care, the "AHV" and "Pro Senectute" provide financial assistance. Elderly people can obtain information on the possibilities of financial support at the "Pro-Senectute Beratungsstelle"[8].

[4] Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009
[5] Thomas B. L. Kirkwood, *Healthy old age,* Vol 455|9 October 2008
[6] Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009
[7] Höpflinger, Hugentobler, 2003

2.2.2. Civil engagement and social participation

With the perspective of living an active and sorrow-free period of life after retirement, engagement and social participation becomes increasingly important, as “normal” work-related social interaction falls away. It entails participation in social, economic, cultural, spiritual and political aspects of life. Even handicapped or sick people have the opportunity to make an active contribution to their families and their environment within the scope of their abilities.

They often take care of their grandchildren and participate in charity work and self-help organizations. 15% of grandparents between the ages of 65 and 79 look after their grandchildren and 25% are involved in some kind of voluntary association (Bundesrat).

Since the health situation is quite different for elderly people, their demand for social participation varies. This requires a broad range of possibilities for the elderly to participate in activities suitable to their situations.

2.2.3. Mobility and housing

For retired people, their flat, house and neighbourhood become the focus of their lives. While many retired people are still quite fit and flexible, the older they get, the less mobile they are.

Most of the elderly are quite happy with their housing situation. Many of them live in their own comfortable homes and enjoy relatively low rents. But when it comes to their environment, they voice the following deficiencies[9]:

- Low air quality
- Lack of safety in their neighbourhood
- Facilities not suitable for wheelchairs/electronic wheelchairs
- No shopping facilities in the vicinity

These factors often propel the elderly to move to nursing homes earlier than otherwise would have been necessary, which brings a high cost burden to society[10].

[8] Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009
[9] Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009
[10] Bundesamt für Statistik: http://www.bfs.admin.ch/bfs/portal/de/index/regionen/thematische_karten/atlas_de_la_vie_apres_50_ans/mobilite_spatiale.html, 19. October 2009

2.2.4. Economic situation

The Swiss retirement system is based on three pillars. The following chart clearly describes the contribution of the three pillars to the monthly rent of the elderly.

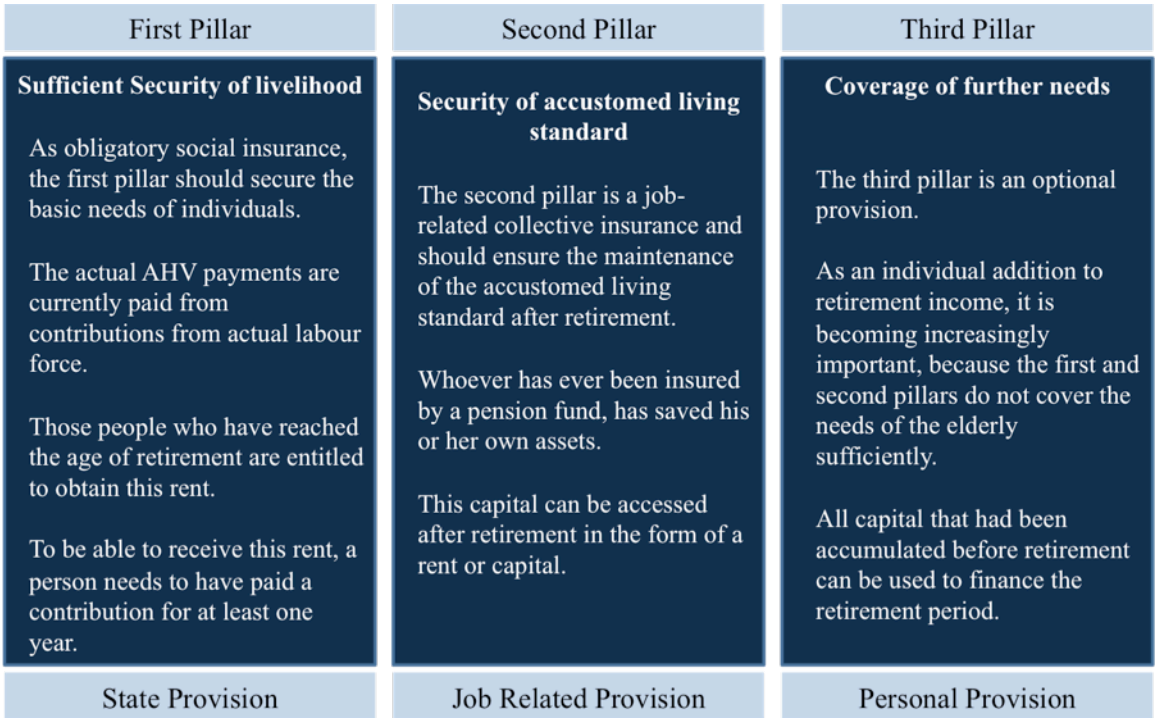


Chart 2[11] The three pillars of the Swiss Pension Scheme

The Swiss Pension scheme prevents the elderly from sinking into poverty by providing them with a minimum income via the first pillar. This amounts to the following:

	Individuals	**Couples**
Maximum AHV annual rent	CHF 27,360	CHF 41,040
Minimum AHV annual rent	CHF 13,680	CHF 20,520

Table 1[12] AHV annual rents

With the contribution of the second pillar, this allows for a very decent retirement life.

The Swiss elderly are comparably wealthy in terms of assets. Their median assets lie at CHF 430,000 for couples, at CHF 170,000 for single women and CHF 230,000 for single men[13].

Nevertheless, with increasing needs for medical care and assistance in daily operations, the average pensioner needs to carefully spend his/her money in order not to sink into poverty. Another concern, which we will not address in this paper, is what will happen to the system

11 Raiffeisen Bank; http://www.raiffeisen.ch/raiffeisen/INTERNET/home.nsf/0/CC04983425D30C3DC1257570002DCB9E/$FILE/Merkblatt%20Pensionseinkommen.pdf, 18th October 2009

12 http://www.123-pensionierung.ch/de/ahv/hoehe-ahv/

13 Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009

when the ratio of people paying for the system and people profiting from the system changes. This will have very serious implications for the system.

2.2.5. Work and retirement

In 1970, more than 30% of men at retirement age were still working. This can be partly explained due to the lack of the second pillar of the pension scheme in Switzerland at that time. Since then, the percentage of people working at their retirement age has decreased[14].

One reason for this is that it is often quite difficult for people over the age of 50 to find a new job. The reasons for this are manifold: low motivation for continuous life-long learning, an incorrect understanding of the capabilities of people over 50 and regulations negatively affecting the employability of this group.

When looking at the fact that older employees have several comparative advantages, such as a lot of experience, loyalty to the company and a more responsible mindset[15], this is certainly a loss for society.

For the "AHV" and for society at large, it would be preferable to have a flexible retirement system, but unfortunately this is contrary to the desire of most people[16].

2.3. Vision

Naturally, the federal state of Switzerland is concerned with solving all of the above-mentioned challenges for the elderly from a macro perspective. Our project *Homes Connected* is an example of how a social business solution brought forward and pushed by private individuals, can bring relief on a micro scale.

It is our vision:

To create a comfortable home for elderly people where they can live whilst maintaining their quality of life until they pass away.

14 Schweizer Eidgenossenschaft, Atlas über das Leben über 50, http://www.bfs.admin.ch/bfs/portal/de/index/regionen/thematische_karten/atlas_de_la_vie_apres_50_ans/activite_et_retraite/activite_professionnelle_aux_ages_de_la_retraite.html, 17th October 2009

15 Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009

16 Bericht des Bundesrates: Strategie für eine schweizerische Alterspolitik, www.bwo.admin.ch/themen/00232/index.html?lang=de, 20. October 2009

2.4. Overview Mindmap

When analyzing the situation of the elderly, we mapped the problem in the following way:

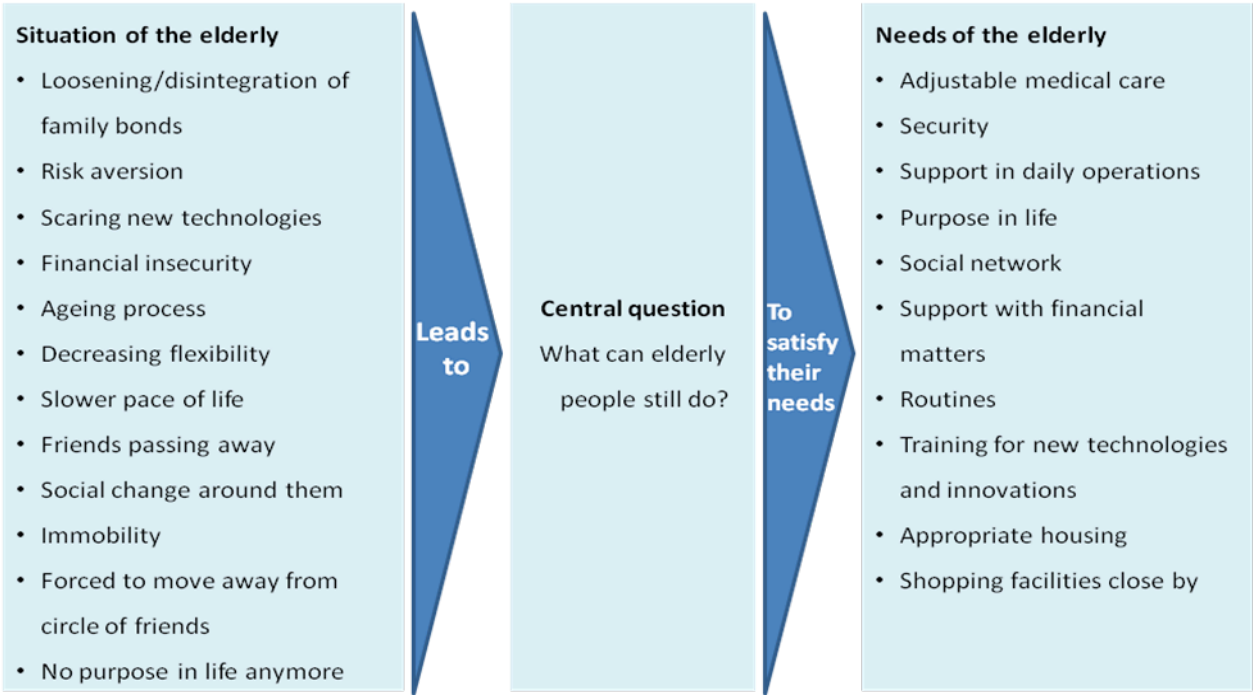


Chart 3 (own creation)

We think that all elderly people have different answers to all three columns. Therefore, we believe that by bringing elderly people from different backgrounds together, and designing a stimulating environment in which everybody answers the question for him-/herself, we can create an ecosystem in which many issues are tackled via social community-based interaction. The following business plan shows how this can offer elderly people a life worth living.

Business Plan

3. Business plan

3.1. Executive Summary

With ageing come many challenges: depending on the individual's health, the elderly need help with shopping, cleaning and washing; they more frequently need medical attention. People around them pass away, which leads to increased loneliness and, often, the sense of a purpose in life falls away with age. As Switzerland will have an increasing number of elderly people, how can this long list of issues be dealt with? Moreover, as the ratio of pensioners to working people increases up to a projected 1-on-1 in 2050, it is impossible for the current financial system to cover the increasing pension costs.

Therefore, this issue requires innovative solutions; concrete concepts that tackle these problems and are still financially sustainable. *Homes Connected* is such a concept. It has found unused opportunities and, very importantly, a creative way to employ this potential.

There are many types of elderly people. There are those, who need help with everything, from getting dressed to going to the toilet. However, there are others who may no longer be as mobile as before, but can still cook, do the gardening or take care of (grand-)children. When looking creatively at elderly people and actively stimulating their self-worth, it turns out that almost everybody can still do something. The challenge is to connect these skills that are still on offer with the demands of other people.

This is the principle on which *Homes Connected* is built. *Homes Connected* is a community of buildings, open to everybody, but at least 50% is occupied by people who are 65 plus years old. It is a small community, with both medical services and a shop for basic necessities. It has a day care service for small children, a communal canteen, a coffee bar and a common room. In other words, *Homes Connected* offers the facilities of any 5-Star residence, but for an affordable price. Its secret is, that it is able to mobilize the capabilities of the inhabitants of the settlement and have many of these substitute activities which otherwise would have to be covered by monetary transactions. Also, building according to the latest environmental standards will significantly reduce energy costs. This does not only guarantee that the financial costs of living at *Homes Connected* will be much lower, but also (re-)integrates many of the elderly into society. Their voluntary activities will keep them in contact with the community around them and offer essential services for this community.

For a long time, it was very hard to connect what person A can do with the necessities person B has. Here modern technology offers a solution. *Homes Connected* uses a digital platform on which members exchange services with each other. An incentive structure and other ingenious features that guarantee its proper functioning support the system. *Homes Connected* also includes a supports centre, which offers the necessary training and guidance for the system to operate smoothly.

Homes Connected enters the market with an innovative concept to solve some of the main challenges of the global demographic change. It sees itself as a social enterprise, which means that *Homes Connected* tries to achieve its social goals, whilst being financially sustainable. The financial calculations show an initial investment of 102 million Swiss Francs is needed. It should then take 21 years to pay back the initial investment and start making a profit. The profits will flow into a social investment fund where the money will be used to finance other projects with similar goals.

3.2. The Concept

Homes Connected is a community of 225 apartments of different kinds and purposes. Designed according to the latest environmental Minergie®-P-Eco-Standard, *Homes Connected* wants to provide sustainable living for its clients according to all environmental, social and financial dimensions. The community will not only consist of housing, but will also feature a common room, a coffee shop, a store for basic necessities, a small medical service centre, a day-care facility and small gardens for the inhabitants. *Homes Connected* aims to fill the apartments with people from all different age groups, but wants at least half of the population to be 65+ years old. This is the core group we wish to provide for, and we believe that when people from younger and older generations connect, this is highly beneficial for both groups.

However, the feature that makes *Homes Connected* so unique is not its extensive offer of housing facilities, but its social interaction. The inhabitants at *Homes Connected* are still able to do many things, such as taking care of children and organizing activities. We believe that asking people to use their skills and interact with each other will greatly benefit the social interaction and the atmosphere at *Homes Connected*. That is why *Homes Connected* works with an incentive system in order for people to actually bring to the table what they can do[17]. *Homes Connected* is supported by a digital platform on which people offer their services and post the needs they have. In return for their services, the inhabitants are rewarded with social credits, whose number depends on the amount of hours they put into the work. These social credits can then be used to, for example, take part in some of the activities, obtain products in the local store (up to a certain amount) and eat in the common room. In many ways, the inhabitants of *Homes Connected* create their own economy, where, guided by the principles of supply and demand, many wants are fulfilled, without the inhabitants having to pay a monetary amount for these services. Thus, even though the rents of the apartment are not that much lower than those of a “normal” apartment, the “free” use of many services will significantly reduce living costs.

In order for the system to be sustainable and finance itself, people from the vicinity can take part in many of the activities and services offered, but will have to pay for them. The money that comes in via this channel is then reinvested in the community projects.

[17] Appendix 1 features a non-exclusive list of examples of services many of the elderly can still offer

As mentioned before, the platform connecting these services is digital. Some may raise the concern that many elderly cannot work with a computer. Although this might be true for many of today's elderly, the next generation of early baby-boomers will already be more apt in using computers. Moreover, *Homes Connected* will feature a support centre, where the elderly are offered computer courses. This training will not only teach them to work with the platform, but also introduce them to the wonderful opportunities of technology. In modern days, technology is an essential tool to enlighten the world of the less mobile elderly. It will enable them to communicate with their (grand-)children, who live further away, and enable access to the almost unlimited potential of the World Wide Web.

The support centre will not only offer help on computer-related matters, but also function as a facilitator in the *Homes Connected* economy. It will be in constant dialogue with people in order for them to put their qualifications online and stimulate people to use the services on offer. The support centre is also the first contact point for any questions from *Homes Connected* inhabitants and plays an extremely important role in realizing social inclusion and cohesion. The support centre is essential for *Homes Connected* to achieve its social and financial goals.

3.3. Business Model

The core income of *Homes Connected* will be generated via the rent of the apartments. As the inhabitants can save on additional living expenses when residing in *Homes Connected,* we can offer market rates and still achieve our social and financial goals. Additional income, though a small percentage of the total, will be generated via the rent of the common room, offering certain services to outsiders (for example, the kindergarten), the shop and medical services.

After the large initial investment, the costs for managing the facility will be small. Each month, 2% of the total rent will be set aside for maintenance work, which will definitely be needed at some point in the future. Also, 5% of the rent income is needed for administration purposes. This percentage is needed both for the running of the support centre and for the management of *Homes Connected.* Further costs of about 1% of total rent income are included in the calculations.

3.4. Market Analysis

As described in section 3, the number of elderly people will grow significantly over the coming decades. This implies that new housing is required. Nowadays, many of the "new elderly" still live in the family home where they raised the children, but which has now become too big for them. Also, the services they need might not be in the close vicinity

anymore. They often need and/or want to move, but still expect a high standard of living. This is an opportunity for *Homes Connected.*

As *Homes Connected* also wants to attract a significant number of non-elderly, the housing market for the younger generation is important too. In Switzerland, there is a shortage of affordable homes in the vicinity of a big city. Especially because of the expected immigration of highly skilled workers, the capacity of the Swiss housing market is expected to remain tight. This is an opportunity for *Homes Connected.*

3.5. Competitive Analysis[18]

In accordance with "Curaviva", the umbrella organization for institutions and organizations for the care of elderly, we identify the following institutions as competition to our project "*Homes Connected*": nursing homes, residences for the elderly, day care centres, night-care centres, care centres for people suffering from dementia, assisted living and elderly living with their families[19]

3.6. Strategic Positioning

Marketing-guru Michael Porter has identified two possibilities to achieve a competitive advantage: cost leadership and differentiation[20]. Cost leadership means having lower costs than the competition and therefore being able to offer better prices. Differentiation means to distinguish oneself from the competition by offering something different from the competitors such as different product features or additional services.

Achieving cost leadership in the area of providing homes to the elderly is relatively difficult. Prices for health care and building maintenance are quite standardized in Switzerland. The possibility to differentiate a housing project from the existing competition is to offer different services and to offer a different intensity of care.

Chart 4 shows where the above identified competition stands relative to the intensity of care and the personalization of services they provide and where we would like to position our own project "*Homes Connected*".

[18] In this paper, we refrain from conducting a thorough competitive analysis. This paragraph merely outlines the different offers of housing possibilities for the elderly

[19] Curviva, http://www.heiminfo.ch/index.cfm/D92C34C9-123F-A677-4C44DBCD47263CA9/, 16th October 2009

[20] Michael E. Porter 1980; Competitive Strategy: Techniques for analyzing industries and competitors; The Free Press, New York

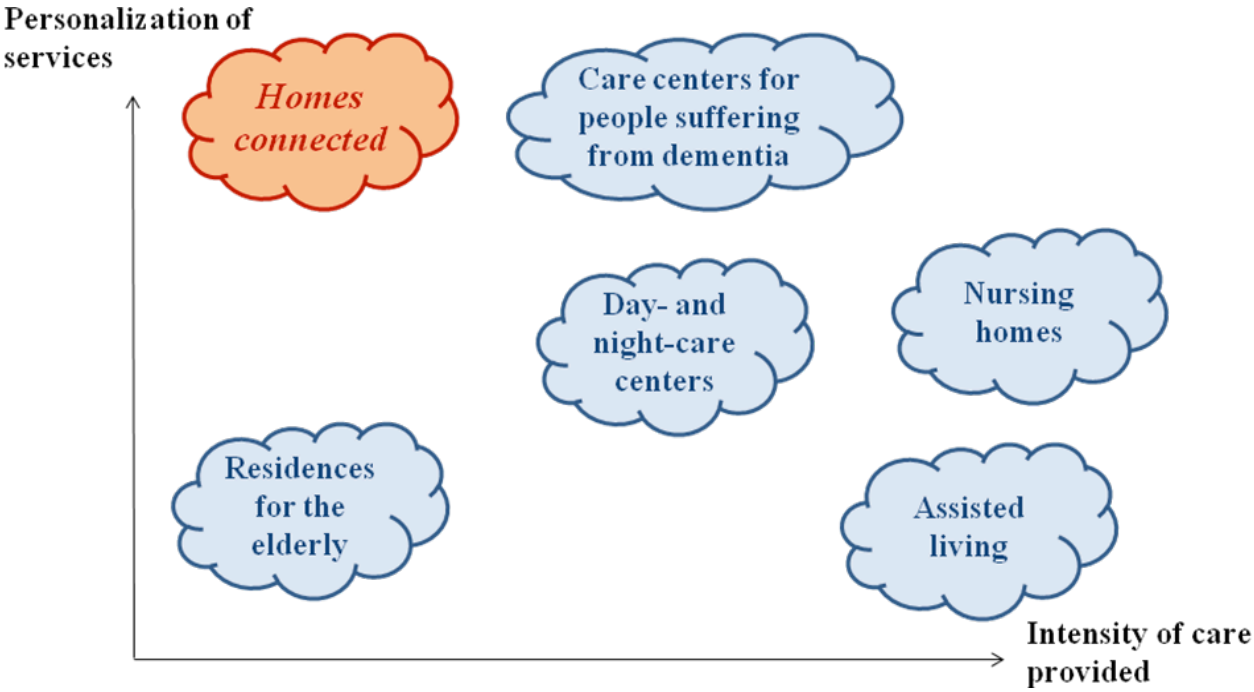


Chart 4 positioning of "*Homes Connected*"

We see *Homes Connected* offering specific services to people who are in need of a relatively low intensity of health care. The unique service we provide is the possibility of a strong interaction within a community of not only other elderly people, but with society at large. With this service we stand-alone and, therefore, possess a clear competitive advantage.

Achieving cost leadership in the area of providing homes to the elderly is relatively difficult. Prices for health care and building maintenance are quite standardized in Switzerland. Thanks to our service system and the efficient building, we think, however, that we do have a competitive advantage in terms of living costs in general. Also, *Homes* Connected clearly differentiates itself from the competitors by offering personalized services and a personalized type of care.

3.7. Social Analysis

As a social enterprise, *Homes Connected* aims to achieve its social goals, whilst maintaining financial sustainability. As is common with social goals, it is impossible to capture the aims in one sentence. Therefore, *Homes Connected* has the following nine social goals:

1. Elderly people are enjoying their life in the community, as measured by an annual survey;
2. The elderly know their financial situation and are able to sustain their livelihood in the community;
3. The basic assistance needed by the elderly is provided by the community;
4. The elderly organize or participate in activities for at least 5 hours per week;

5. The elderly interact with at least 10 different people in the community per month;
6. The elderly learn a new skill every half a year;
7. The elderly are able to communicate via the newest communication tools;
8. The community offers at least once per quarter an excursion (participation voluntary);
9. The community has at least one central event per month.

Homes Connected believes it can achieve its social goals mainly via the voluntary participation as incentivized by the communication platform. However, in order for the social goals to be inclusive, the *Homes Connected* support centre has the task of actively engaging with people in order for them to join the system. Also, the support centre will be responsible for constant monitoring and evaluation of the communication platform, in order for it to serve as an enabler of our social goals.

3.8. Financial Analysis[21]

As we are in an early stage of the development of the project, the financial analysis is very preliminary and contains many unknowns. The numbers in the analysis are based on benchmarking with existing projects, and the statistical office of the canton of Zurich (where the project will most likely be built).

After comparing several other housing projects, we believe that the size needed for *Homes Connected* to function as intended would be around 400 to 500 people. The total land needed for *Homes Connected* might seem excessive at first. However, if one includes all the services *Homes Connected* offers to its inhabitants, it becomes clear this area is necessary and actually will be a key success factor for the project. This information is summarized in table 2.

Housing Information			**Area Size Information**	
Number of apartments	225		Housing area	18,000 m^2
Av. apartment size	80 m^2		Outlet area	1,600 m^2
Rent for av. apartment	1,700 CHF per month		Common area	800 m^2
			Total land needed	13,000 m^2
			Price per m^2	1,160 CHF

Table 2: Key Data

[21] We have decided to do a very simple financial analysis. The calculations here are meant to present an indication of the scale of the project. Important considerations such as discount rates are, on purpose, not included in the financial analysis.

Table 3 describes the investment needed. The size of the project and the ambitious social and financial goals mean that *Homes Connected* requires a large initial investment to get started. It has not yet been decided which strategy to use for financing, but the following partners are considered to be: the canton of Zurich, private investors via stocks, the sale of bonds with a fixed interest rate, a mortgage via a bank or a combination of these options. The board of *Homes Connected* would like to discuss the different options in the very near future.

Investment Cost Analysis	
Land Purchase	CHF 15,080,000
Building Costs	CHF 75,400,000
Interest payments & Building fees	CHF 11,875,500
Total	**CHF 102,355,500**

Table 3: Initial Investment Needed

Table 3 contains a simple income statement intended to give the reader of this business plan an overview of the scale *Homes Connected* is working on. As can be seen, when not concluding the initial investment, the profit per period is quite substantial from the very start onwards. *Homes Connected* believe that 21 years is needed in order to reach the break-even point, which is not a bad achievement for a housing project. Afterwards, the cumulative profits should start increasing quickly. These profits will then flow into an investment fund, which will help other projects, similar to *Homes Connected,* to get started.

	2015	**2016**	**…**	**2036**	**2037**	**…**	**2049**	**2050**
Income	CHF 4,039,200	CHF 4,634,982		CHF 8,503,851	CHF 8,852,312		CHF 10,992,922	CHF 10,118,196
Costs	CHF 279,072	CHF 320,235		CHF 664,847	CHF 732,328		CHF 909,414	CHF 699,075
Profit after Tax	CHF 2,820,096	CHF 3,236,060		CHF 5,879,253	CHF 6,089,988		CHF 7,562,631	CHF 7,064,340
Cumulative Profit after Tax	CHF -99,535,404	CHF -96,299,344		CHF -4,081,710	CHF 2,008,278		CHF 81,481,616	CHF 88,545,956

Table 4: Income Statement[22]

[22] The excel calculations are available on request from the authors.

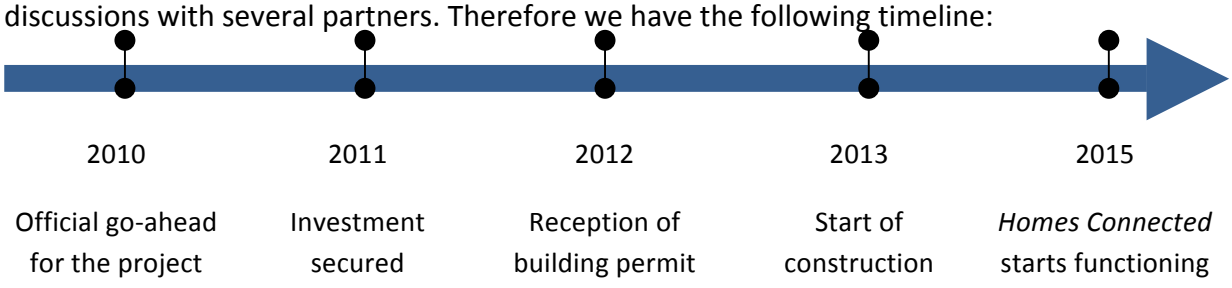
3.9. SWOT

Strengths	Weaknesses
• Innovate idea • Sustainable concept • Satisfy many needs of the elderly • No continuous investment needed	• No extensive medical care • Focus on a group, which could opt to stay at their old home • Some people might not be able to adapt to the community (mindset, abilities, …)
Opportunities	**Threats**
• Growing market for housing of the elderly • Housing market expected to remain tight • Technological development • No direct competition	• New market entrants • Hard to obtain financing in current market environment • No market demand for this particular service? • Government involvement in the market: we have a capital cost disadvantage

Chart 5: SWOT Analysis

3.10. Timeline

This business plan is meant to be a first step towards making *Homes Connected* tangible. It should serve to convey the strengths and weaknesses of the project. However, before the actual implementation will start, the plan will have to be significantly modified after lengthy discussions with several partners. Therefore we have the following timeline:



4. Conclusion

We believe *Homes Connected* provides a concept, which is able to solve many issues connected to global demographic change. It provides highly personalized services at a micro level and still has the opportunity to be scaled up. This flexibility combined with cost-effectiveness are the key ingredients for a truly sustainable solution.

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List of Figures

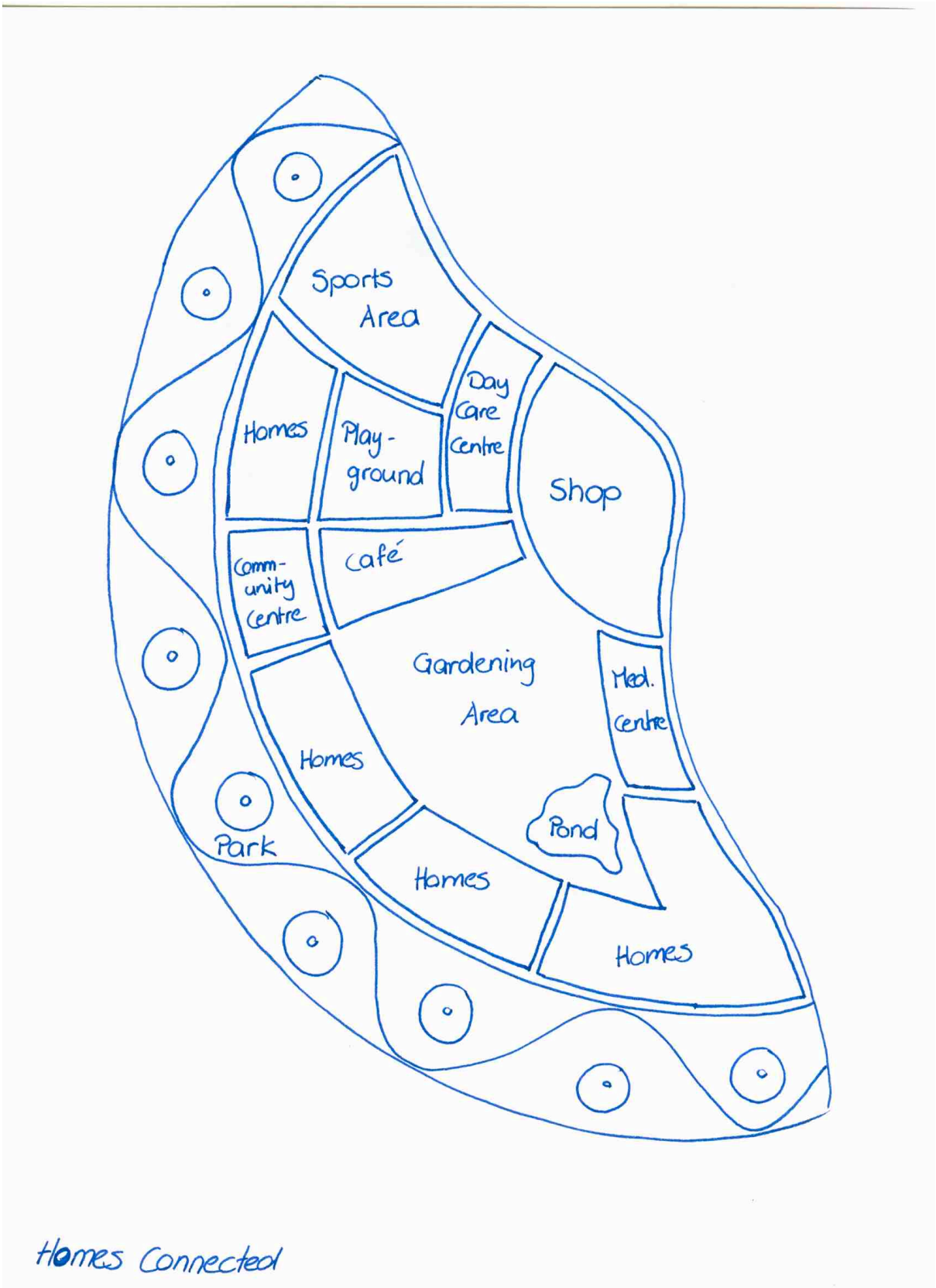
Charts

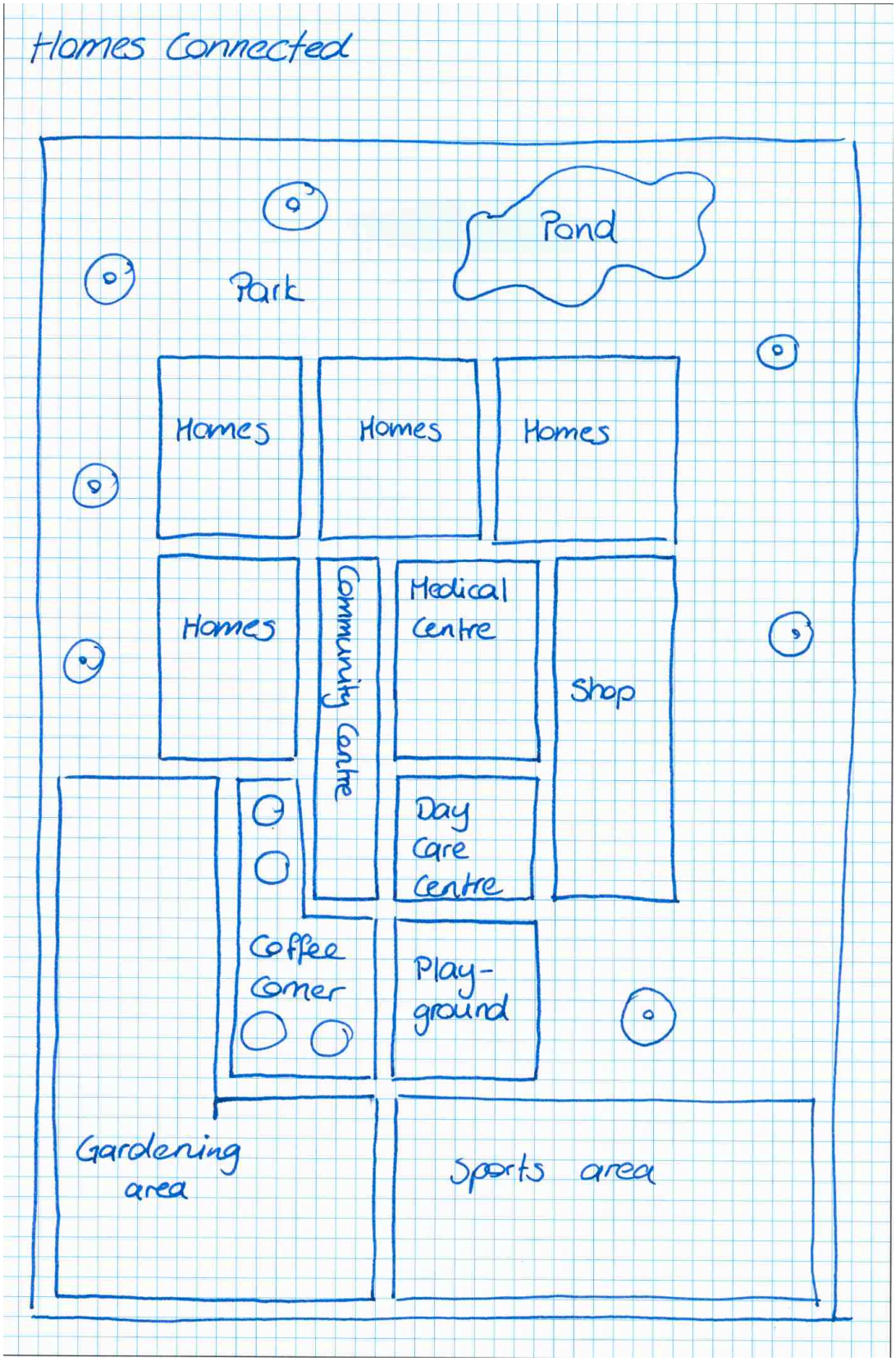
Tables

Appendix 1: A non-inclusive list of what the elderly are still capable of doing

- Cook
- Gardening
- Storytelling
- Taking care of the (grand-)children
- Giving advice (from their professional background)
- Homework help (“teaching assistant”)
- Handicrafts
- Write / journalism
- Voluntary work (for example helping out in the daycare centre)
- Organize activities / events
- Run a café
- Doing what they did during their professional life
- Teaching each other (for example knitting)
- Chauffeuring (car-sharing)
- Shopping
- Cleaning
- Accompanying others: for example support somebody with Alzheimer’s (keeping company)
- Repairs
- Passing on their experience / expertise
- Artistic contributions
- Life coach
- Game competitions
- Sport training
- Taking care of pets. Elderly can help out during vacation
- Delivering the mail (a way to get to know everybody)

Appendix 2: Drafts for area planning




Homes Connected
Pond
Park
Homes
Homes
Homes
Homes
Community Centre
Medical Centre
Shop
Day Care Centre
Coffee Corner
Play-ground
Gardening area
Sports area

Universität St.Gallen

Hochschule für Wirtschafts-, Rechts- und Sozialwissenschaften

(HSG)

Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 8

Prepare a submission to the Walder Stiftung Award "Leben und Wohnen im Alter" ("Life and living in old age") by developing a business concept as to how elderly Swiss citizens could live in an innovative and stimulating environment.

Authors

Andrin Huber

Alexander Pole

November 2009

St. Gallen University

Megatrend "Global Demographic Change"

Dr. Hans Groth

CONTENTS

1. Background – Challenges in an ageing society

1.1 Changing demographics in Europe

"Schweiz droht Überalterung" (Schell, 2001), "Überalterung – Herausforderung des 21. Jahrhunderts" (SRDRS, 2008) ("Switzerland and the threat of ageing" (Schell, 2001), "Ageing – challenge of the 21st century" (SRDRS, 2008): During the last few years, many such headlines could be read in newspapers and other media in Switzerland. While many people primarily associate negative thoughts with the demographic change – increasing health costs, social imbalance or a shrinking working population – there are many opportunities to take advantage of the change and thus see it as a new or growing chance for doing business. But prior to having a closer look at the opportunities for business, the demographic trends in Switzerland should be discussed.

Demography is the study of a population by means of statistics. Thus, the main indicators are the size and structure of the population. Demographic changes in the past can be exactly measured by statistics that aids in making predictions about future changes. However, there are factors influencing the demographic development which cannot be exactly predicted and thus lead to scenario building in the field of demographic forecasting.

First of all, an analysis of the last century is of interest, because changes in the past can lead to implications for future developments. Thus the change in population size is the main topic of demographics and is influenced by three factors: fertility, mortality and migration balance (Stanowsky, 2005, P.2). In Switzerland, the population increased by nearly the factor of three from 2.5 million people (1860) up to 7.4 million (2004) (Kohli, Bläuer Hermann & Babel, 2006, P.13). As observable in figure 1, the growth rate was not steady but peaked between the years 1950 and 1980. This

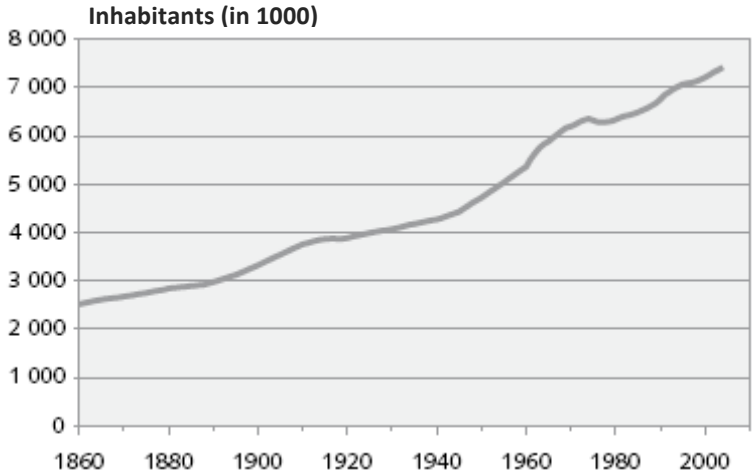


Figure 1: Population Growth in Switzerland (Kohli et al, 2006)

temporary growth increase was based on one hand on the baby boom and on the other on a higher immigration level caused by the economic prosperity, which ended in the mid seventies parallel to a decrease of the population growth rate. Furthermore, the life expectancy steadily increased from 44.2 years (women) in 1880 to approximately 83 years today (Bundesamt für Statistik, 2004). The trend toward a higher life expectancy and a corresponding decline in the birth rate, which has been observable in the past decades leads to a change in the age pyramid. It is no longer a constantly declining triangle as it was at the beginning of the last decade: its peak now lies at the age of slightly above 40 years due to the baby boomer generation now reaching this age. Even though the exact shape of the pyramid is not predictable in the future, we can forecast a massive increase of people above the age of 65 (and thus out of the labor market) in the next 50 years. This phenomenon occurs because the baby boomers will retire and this moves the pyramid's peak upwards (figure 2). As not all factors influencing the population growth are exactly predictable, the Swiss Bundesamt für Statistik (Swiss Federal Statistical Office) published three different scenarios to predict the future demographic change. Lying beside a scenario at the upper end and one at the lower end, the trend scenario will be used for the further analysis. This reference scenario predicts a population increase of up to 8.2 million in the year 2036 and a slight decrease after that year (Bundesamt für Statistik, 2006, P.7).

However, the above-mentioned growth affects only the part of the population, which is older than 45 years and increases with age. Parallel to this, the total number of people aged

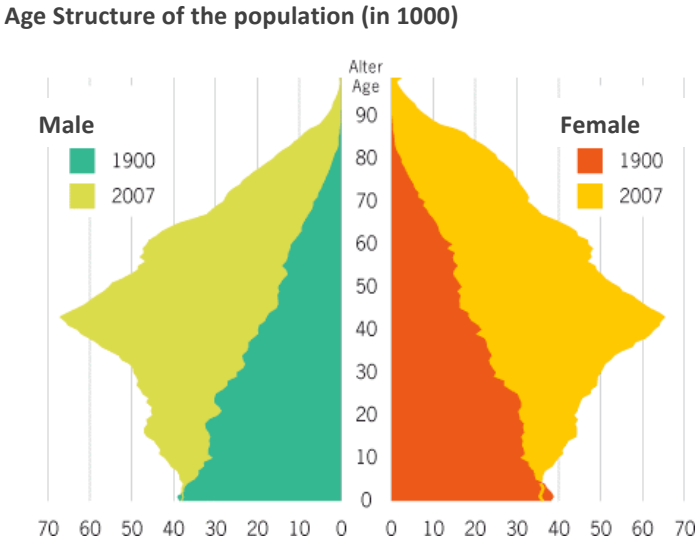


Figure 2: Demographic Structure in Switzerland (Bundesamt für Statistik,

44 and younger will decrease by 15%. The result is a massive increase of the age quotient: in 2050, the proportion between people above 65 years and those in the working age (20-65) will double up to 1:2. There are only marginal differences in the relative aging[1] between the three scenarios (Bundesamt für Statistik, 2006, P.7). Thus, the trend to an ageing of the society does not depend on how optimistic or pessimistic the assumptions for future developments are.

While Switzerland has the chance to optimize or at least to lower the negative effects of the demographic change through intelligent migration politics[2], other European countries have far worse perspectives. One example is Germany, having a shrinking population at this stage; it will lose approximately 9.3% of its population by 2050. At the same time, its age quotient will jump up to 0.56 from today 0.3 (Giannakouris, 2008, P.5f). The same picture is shown by the statistics of the European Union: on one hand, they forecast a population increase from 495.4 million in 2008 to 520.7 million in 2035 and afterwards a decrease to 505.6 million until 2060. On the other hand and comparable to the development in Switzerland "the share of people aged 65 years or older in the total population is projected to increase from 17.1% to 30.0% and the number is projected to rise from 84.6 million in 2008 to 151.5 million in 2060." (Giannakouris, P.1). Thus a general trend of an ageing society is observable across Europe.

1.2 Challenges to society, economy and state

Seen from an individual perspective, the demographic change may be something desirable: people live longer and spend their evening of life in comparable good healthiness

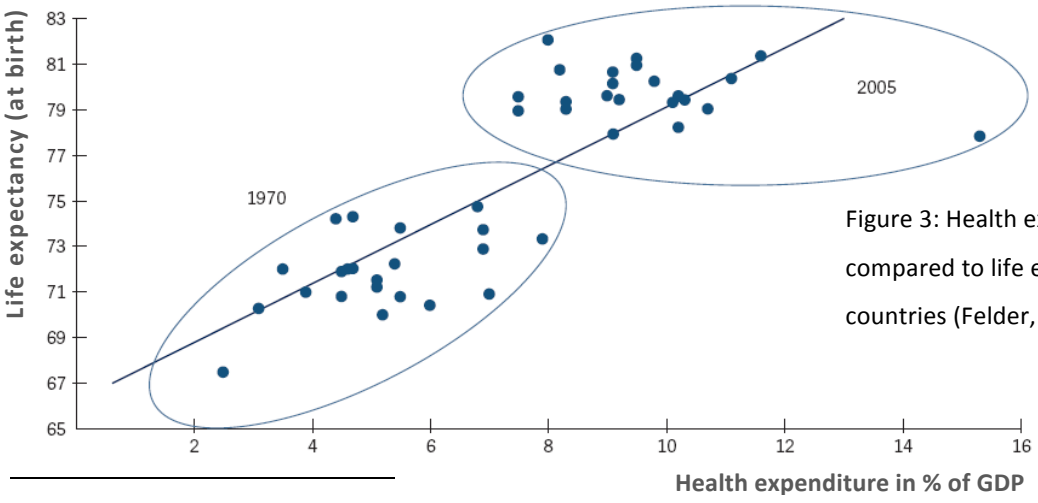


Figure 3: Health expenditure compared to life expectancy in OECD countries (Felder, 2008)

[1] Relative ageing = the change of the age structure
[2] The strong economy and high standard of living make Switzerland attractive to migrants.

(Doblhammer & Ziegler, 2006, P.267f). However, on an economy-based level the same phenomenon leads to a great challenge for the social security systems and economic growth in industrialized and highly developed countries (Tivig, Frosch & Kühntopf, 2008, P.10).

An ageing society obviously has a strong impact on old-age insurance systems like the AHV in Switzerland and the health insurance since both of these social security systems are based on the idea of solidarity between the generations, respectively between healthy and sick people. With an increase in the age coefficient, a decreasing number of people will have to pay the pensions of more and more retirees.

Besides other factors responsible for growing costs in the health system, an increase of the life expectancy is linked to higher health expenditures, as figure 3 shows. And the trend is towards further increases in health expenditures even though cost cutting in the health system has become an important political issue. The change of the age structure leads to an increased need for elderly care and hence an explosion of care costs, because the segment of people over 80 is the one with the highest relative growth rates (Bundesamt für Statistik, 2006). At the same time, it is mainly this group that requires intensive care (at this age, approximately half of the people need an aide in daily life). Within 10 years, the costs for long term care in Switzerland increased by 45% to CHF 7.3 billion in 2005 and will further grow to approximately CHF 18 billion until 2030 (AP, 2008). In Germany, the same trend is forecasted: the number of people who need care will increase by 58% from 2005 to 2030 (Bundesministerium für Familie, Senioren, Frauen und Jugend, 2005, P.2). In addition to public insurances, the costs of care are privately financed mainly by those who need care. These costs can be immense, depending on how much care a person needs. In the worst case, the costs for staying in a care home and for the care service are up to CHF 10,000 per month in Switzerland, and approximately 75% of this value must be privately financed (Döbeli, 2009).

Not only is the higher number of people requiring care responsible for the cost increase: in addition, socio-cultural trends lead to a professionalization of elderly care and to growing expenditures. The importance of the family for elderly care is decreasing: in Germany for example the number of people in care homes grew by 6% from 2003 to 2008, while cases where the family is responsible for the care shrunk by 1% during the same period. The main

cause for this development is the decreasing will/ability to organize the care within the family (Statistische Ämter des Bundes und der Länder, 2008, P.19). There are two reasons for this: (1) an increased mobility of the society is observable. People do not live their whole life at the same location / in the same town anymore. The physical distance between family members thus increases. Children no longer live near their parents who need care. The support of daughters and daughters-in-law who are often responsible for the care of the parents thus falls away and is done by professional care personnel (P.20). (2) The number of single households is growing and hence is the number of people caring for their spouse / partner decreasing: more than half of the women aged over 70 live in a single household. A growing rate of divorce will emphasize this trend in future even more (Worldpress, 2008). All these effects lead to a heavily growing number of people who are dependent on professional care and, as disclosed, a cost explosion in the field of (publicly and privately financed) elderly care.

The negative effects for the economy are a problem, which should also be considered. Mainly the shrinking labor supply and the changing age structure of the labor force may result in decreasing economic growth: economic growth is mostly based on three factors: the production capital, the size of the labor force and the technical progress. Thus a shrinking population and especially a shrinking labor force (due to the retirement of the baby boomers) strongly affects an economy's performance. A change of the labor force's demographic structure to an increase of the average age may result in a loss of innovation capability and thus in a deceleration of the technical progress. The reason lies in an overall loss of desire for innovations parallel to an increase of the age (Kröhnert, 2007). All this may lead to a shrinking prosperity of the society and increases the pressure on financing the social security systems (which are already under pressure because of the ageing of the society).

Even though there are ways and options, which may dampen the effects of the demographic change, the age structure of the society will culminate in an ageing of the population. Thus, the government and private actors will be increasingly challenged to build an infrastructure and general social conditions that are age-based on one hand, but do not on the other hand, overload the solidarity principle between the generations.

1.3 AAL technology – An answer to ageing and living?

The demographic change leads to an ageing of the society. At the same time a trend towards individualization is observable. People want to stay independent even at a great age and the wish to live in one's own home is omnipresent. With growing age, people need more and more help to do so, but relatives are not willing to give the elderly the needed non-financial support and the costs for care are very high (see chapter 1.2). As a compensation for age-dependent restrictions, AAL-technology provides exactly what is needed by a society in the process of demographic change. It helps to extend the autonomy, the quality of life and provides security by taking over or alleviating – favored – parts of day-to-day tasks (Jähnichen, P.2). Figure 4 shows different options where the application of AAL-technology is expedient.

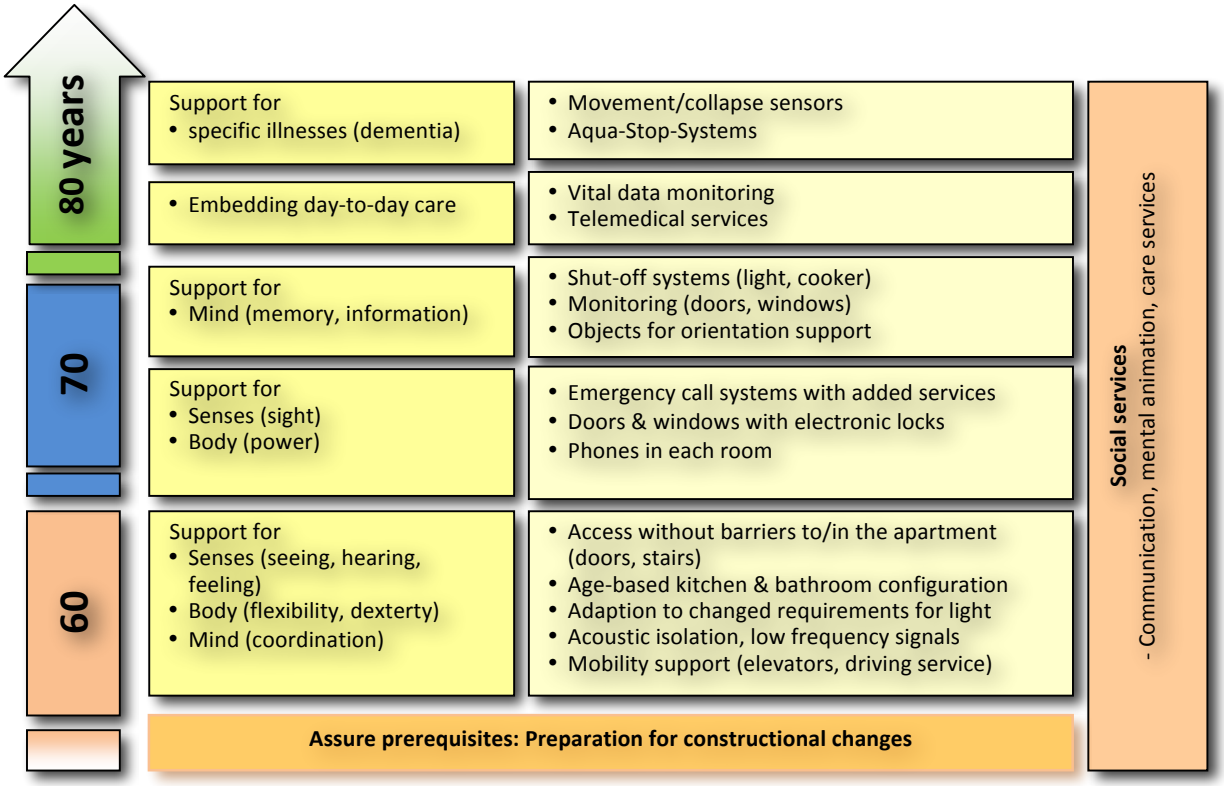


Figure 4: Application areas for AAL-technology (Bundesministerium für Bildung & Forschung, 2009)

But what exactly is AAL-technology? The concept of "Ambient Assisted Living" includes development and assistance systems supporting people in a technical way in situations of excessive demand and too much complexity. The idea is to support the user in day-to-day situations by compensating age dependent restrictions with intelligent technical systems and thus provide the user with autonomy, which would otherwise be lost (Jährnichen, P.1). A

main trait of AAL is the use of different developments from information, communication, diagnostic, and other technologies. Examples are intelligent reminders, navigation systems, or collapse monitoring systems: information and communication technology is used in objects of everyday use in order to make life easier, safer and provide personal autonomy. The idea is a close-meshed grid of assistance and aid in which all persons who support the elderly person are embedded – the family, care service, family doctor, the hospital and the pharmacy.

At the same time, the system helps to reduce health and care expenditure: by substituting expensive human support for elderly people, AAL-technology provides the chance to reduce the costs of demographic change for the society as a whole and for every person dependent on professional care (Meyer, 2008, P.1). An expedient use of the technology can postpone the move to expensive rest and care homes, a step which is inconvenient for many people. As stated, it is the wish of many people to live as long as possible in their own homes. Thus, AAL-products support both financial and social necessities of the society. But its potential goes beyond supporting elderly people. An increasing number of people suffer from adiposity and its consequences. Mainly in the United States, but also increasingly in Europe, people need weight management. AAL is an ideal solution to make their lives easier. There is an even broader application spectrum in the area of long-time health problems (Diabetes, Parkinson, Alzheimer, etc.) and rehabilitation. Altogether, there is a large market potential for AAL-technology in industrialized countries and the structural and societal changes will even increase this potential in the future.

1. 4 Lacking Market Breakthrough

The use of the technology seems to be reasonable for all stakeholders. However, the commercial launch of AAL-technology has not yet been successful for different reasons:

- At present AAL-technology is positioned at a high price level even though most of the required technology is already used in mass products. Due to Zagler (2007), the high price is caused by the “chicken-and-egg” problem: AAL-systems are still expensive because their market is still small and there are no economies of scale. Thus, the system is not yet extensively used because of its high price.

- Typical users of the technology are aged 70 and older which means that the present-day potential customers have not been exposed to much information and communication technology during their life. Thus being somewhat reserved toward a new technology that interferes in one's life is understandable.
- A third reason for the missing breakthrough is the actors of the health system. Established actors fear the loss of their position in the system by structural changes through new technology (Maucher, 2008, P.9). Because of a quasi-monopoly position of many actors and a missing separation between market economy and a governmentally controlled market, the actors are not forced to take entrepreneurial risks.

Even though these problems are not insurmountable, they prevented a successful breakthrough of AAL-technology so far. Approaches to change this situation are discussed in the following chapter.

2. EasyLive – AAL technology for the mass market

2.1 Goals

As pointed out earlier, AAL technology has not achieved any breakthroughs in Europe, despite public subsidies and many technological developments. We believe that this breakthrough can only be reached through mass-market products financed by the private sector. Higher regulated markets can then be tackled on a step-by-step basis as the feasibility and cost efficiency of these systems become apparent. The "EasyLive" project aims at accelerating the application of AAL technology in the Swiss and German mass markets. This will be done by combining existing AAL components to an integrated, interoperable system that is based on archetypal processes to support elderly people within their domestic environments.

An obstacle to the diffusion of AAL technology is the high number of isolated applications lacking interface standards. Functional overlaps of different applications can therewith confuse the patient/user as to which alternative for action is to be taken. This challenge will be solved by our EasyLive system; one of our main archetypal bases on an interoperable hard- and software that combines information from all end applications into one single system, such as a personal computer installed in the living room. Action is also required in the user-machine interface, as a lack of transparency exists due to the high variety of functionalities in existing AAL systems. The Continua Health Alliance[3], the IEEE and the IEC/ISO organizations have established user interface standards, which will be adopted within our system.

The development of a system in line with market requirements will take place in a field study addressing major diseases of ageing (Cardiovascular/Diabetes/Dementia). The EasyLive project consists of three phases:

- Development and testing of archetypal AAL product components (3-6 months)
- Clinical field testing with 20-30 households at risk of major diseases of ageing (12 months)

[3] See [www.continuaalliance.org]

- Economic evaluation, development and marketing of final system with industry partners (3-6 months)

We envisage the EasyLive system to be privately financed by end users. Win-win situations can most likely be expected in this market segment, especially if the EasyLive assistance systems are more cost efficient than conventional care services not covered by health insurances. However, it can be assumed that with proven user acceptance and cost efficiency, the public and private health system will eventually participate in the financing of this system.

2.2 Market

It can be observed since many years that specialized AAL solutions have been unsuccessful, as they have failed to generate a critical market mass that supports further development[4]. Its market positioning puts the EasyLive system at an advantage versus the existing, highly specialized solutions. Figure 5 shows the positioning of EasyLive in the market for AAL systems.

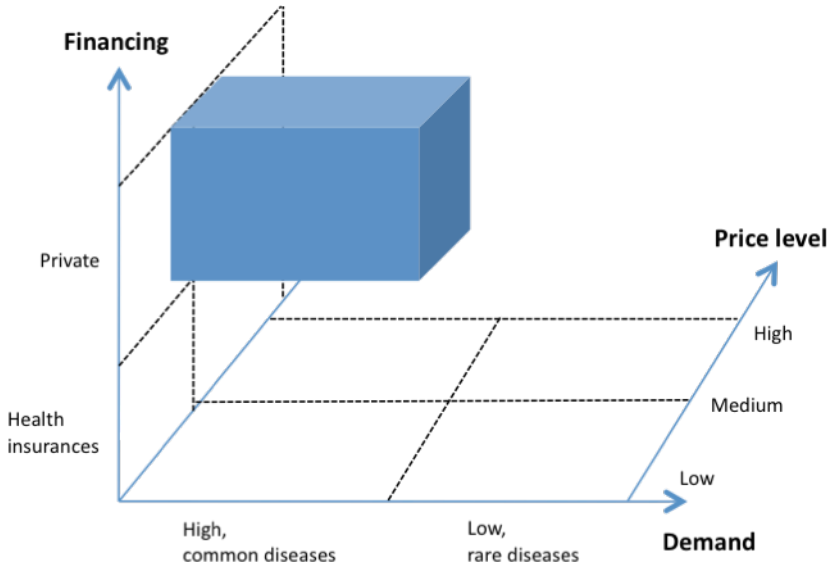


Figure 5: EasyLive market positioning

We focus on three major disease fields, namely cardiovascular, dementia and diabetes. As these diseases are very common among elderly people, we expect a high number of cases and demand. According to the German health report prepared by the Robert Koch Institut

[4] This conclusion can be drawn from the evaluation of the EU project TIDE and the analysis of the Robert Koch Institute regarding the market failure of technical assistance systems for dementia.

(2002, P.14) high blood pressure (hypertension) is the most common disease symptom among elderly people. More than 30% of patients above 60 years are diagnosed with a high blood pressure. Heart diseases are also very common as 17.4% of women and 11.6% of men are diagnosed with a heart insufficiency and 24.2% of women and 27.4% of men with a coronary heart disease in the age group between 60 and 79 years. These proportions strongly increase with age to more than 35% in the age group above 80 years. The two indication fields, namely heart and circulation (cardiovascular) are responsible for more than 44% of all deaths and more than 50% in the age group above 80 years. As figure 6 also shows, diabetes is very widely spread. More than 13% of men and more than 14% of women above 60 years are diagnosed with diabetes.

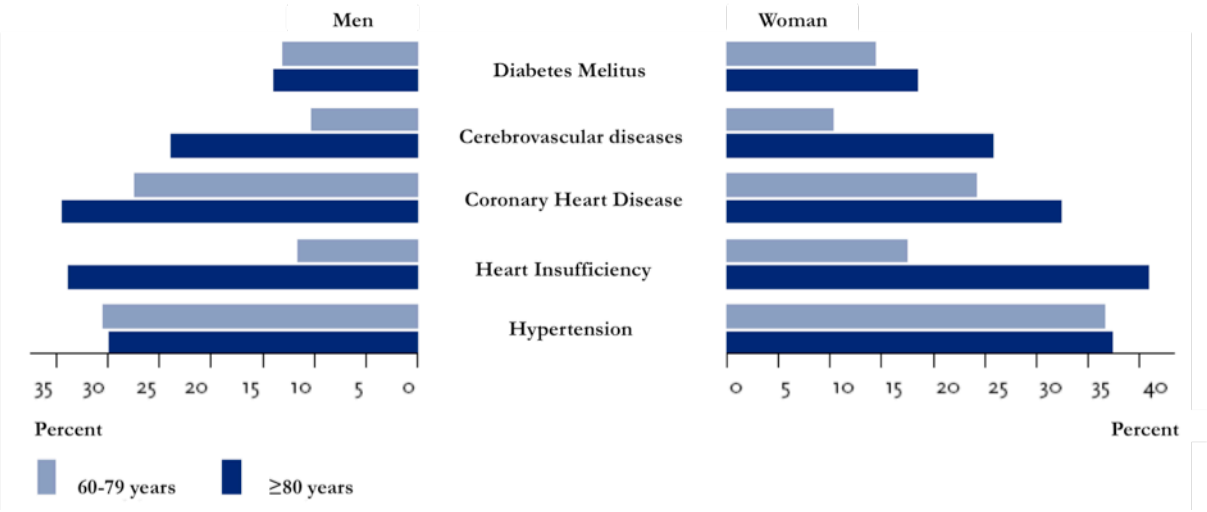


Figure 6: Proportion of patients with chosen diagnoses in ambulant medical treatment in Germany (Robert Koch Institut, 2002)

Dementia is a further illness, which has an increasing prevalence within the elderly population. As a rule of thumb, the probability of developing dementia doubles every five years, starting from 3% in the age group between 65 and 69. The most common cause is Alzheimer, which accounts for approximately two thirds of all dementia cases. Figure 7 illustrates the incidence of dementia throughout the aging process.

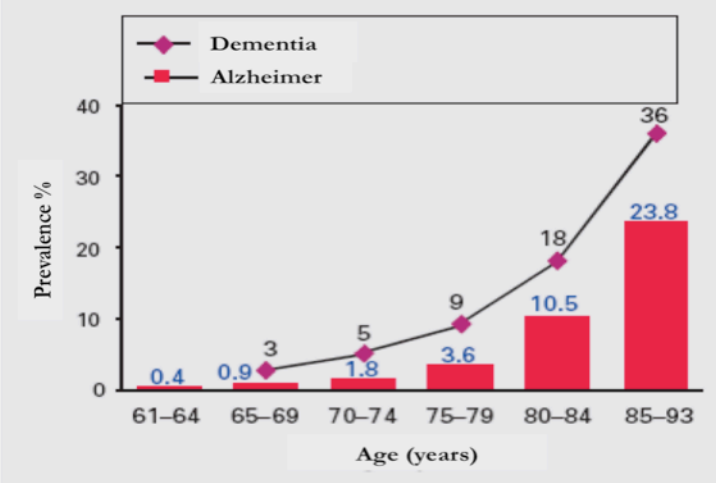


Figure 7: The incidence of dementia (Jorm & Jolley, 1998)

The mass market for AAL applications can only be efficiently tackled in the low to medium price range. We plan to be positioned between the low price segment that consists of stand-alone supermarket-, do-it-yourself-systems and the high price segment consisting of full service AAL providers. As pointed out earlier we focus on private financing until the feasibility has been proven. This makes our business model independent from the highly regulated public and private health insurance market. We believe that the medium price range is ideally suited to the elderly generation's needs as the price is not the main decision factor for many potential AAL users. Studies by Roland Berger and the German government show that the most important buying decision factors for elderly people are product advice, intelligibility and ease of handling. Not only is the buying power of the "silver generation" constantly increasing but also its propensity to spend as the after-war generation has a lower saving rate than earlier generations (Bundesregierung, 2009). Additionally, the generation of "young elderly" reaching the age of 65 show a greater acceptance for modern information-technical applications. These factors indicate a great market potential for privately financed and integrated AAL systems.

2.3 Product

The EasyLive system aims to provide AAL support services for patients/users at risk of three major disease fields, i.e. cardiovascular, dementia and diabetes. The system will integrate patients/users and existing AAL support systems into a service architecture covering the entire supply chain. Hence the project does not aim at developing specific new technical products, but to develop a modular and flexible support system integrating all players,

corresponding to mass-market requirements and standardizing interfaces. Figure 8 illustrates this service architecture.

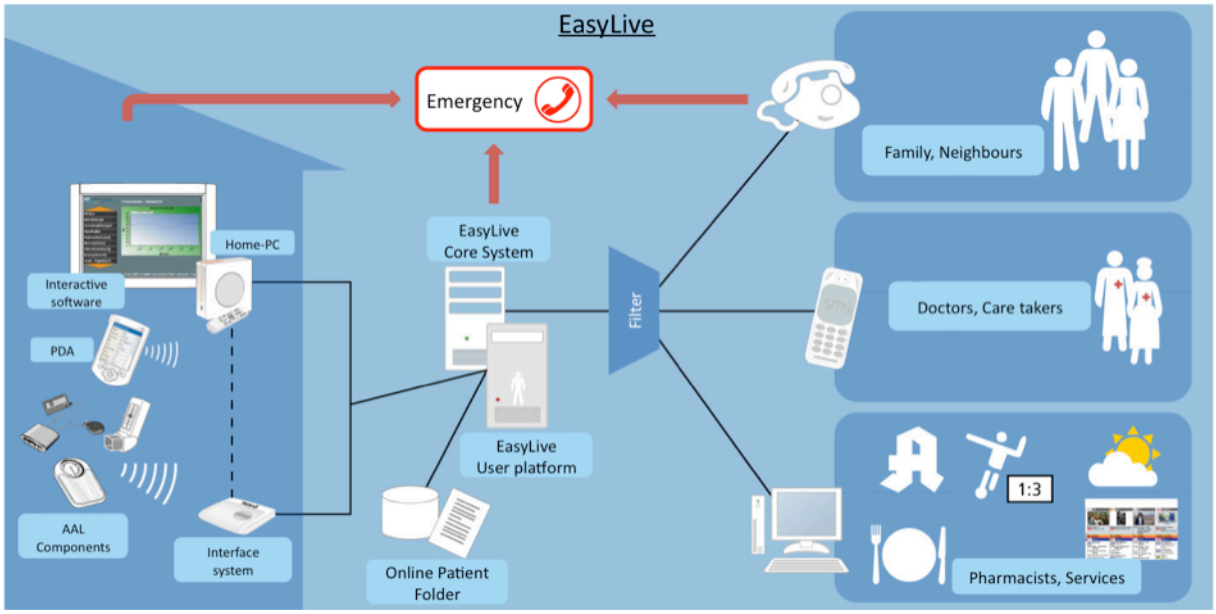


Figure 8: EasyLive System Architecture

The AAL components in use pass the information to the core system, which is interconnected with an interface system, a home-PC, an online patient folder and an emergency service. The core system can be described as a hardware and software system that manages information and intelligently passes relevant information to the social network (such as family members or neighbours), to the supervising doctor, to further service providers (such as care takers or pharmacists) and into an online patient folder. It is clear that these information flows need to be evaluated and filtered automatically by the installed decision software. The doctor for example should only be informed in case symptoms or vital statistics of a patient have worsened. The programming of these decision parameters would be done in cooperation with industry partners, doctors and universities experienced in the field of intelligent medical decision systems. However, flexible settings would be available on a case-to-case basis.

For each disease field we differentiate between three stages of severity:

- Prevention (users at risk but without illness)
- Monitoring (users with progressing illnesses but have the ability to live independently)
- Treatment/Care/Emergency (users that require support in vital functions)

Since the many technical alternatives, the complexity of illnesses and the different requirements of illness-stages imply an infinite amount of possible support system architectures, we believe that successful business models can only be developed if we rigorously reduce this complexity and variety to archetypal base functions. The disease fields in combination with the grades of severity determine the mix of AAL components necessary to cover the supportive function. However, the base of all supportive systems will consist of two core components: the intelligent emergency system and the medication box.

- The ***intelligent emergency system*** aims to prolong comfortable, safe and independent living of elderly people in their own domestic environment, thus preventing or delaying a transfer into a hospital or elderly home in the case of having a chronic disease. It is based on intelligent house technology (domotics) and guarantees an extensive medical and care support through an interconnection with telemedical applications such as virtual consultations. Additionally, it lightens the care taker's and family member's burden. The prototype of an intelligent emergency system will be developed with an integrated IT partner and shall (1) be modularly built, (2) consist of active and passive surveillance systems, (3) be versatile and adaptable to specific disease conditions and (4) be interconnected with E-Commerce and mobile data services. According to a representative study by the Bundesverband Informationswirtschaft, Telekommunikation und neue Medien (BITKOM, 2009) in Germany, intelligent emergency systems have the highest acceptance rate among respondents above 65 years as 58% of them would have an interest in this system in the case of having a chronic disease.

- The ***medication box*** addresses the compliance of the medication therapy and aims to reduce the high re-hospitalization rate. The integration of an automated medication system is a preventive measure that distributes and controls the medication therapy and records this information into the online patient folder. According to the Health Survey by the Robert Koch Institut (2008, P.152), more than 80% of people above 60 years regularly consume medication. The average amount of medications taken is around 4 and almost all medication consumers take more than 2 medications regularly.

Age group	Women	Men
Medication consumer		
60-69 years	89,2%	82,3%
70-79 years	92,9%	87,4%
Average amount of medications taken		
60-69 years	4,3	3,6
70-79 years	4,8	4,3
Proportion of multimedication (2 or more medications)		
60-69 years	86,0%	80,7%
70-79 years	85,1%	89,1%

Figure 9: Medication consumption statistic in Germany (Robert Koch Institut, 2008)

This statistic shows that prevention and symptom therapies through medication have become an integral daily routine for elderly people. The strict adherence to the prescribed medication therapy is important to prevent hospitalization or emergencies. According to the survey by BITKOM (2009), medication surveillance systems have the second highest acceptance among users above 65 years, as 54% of them would be interested in such a system.

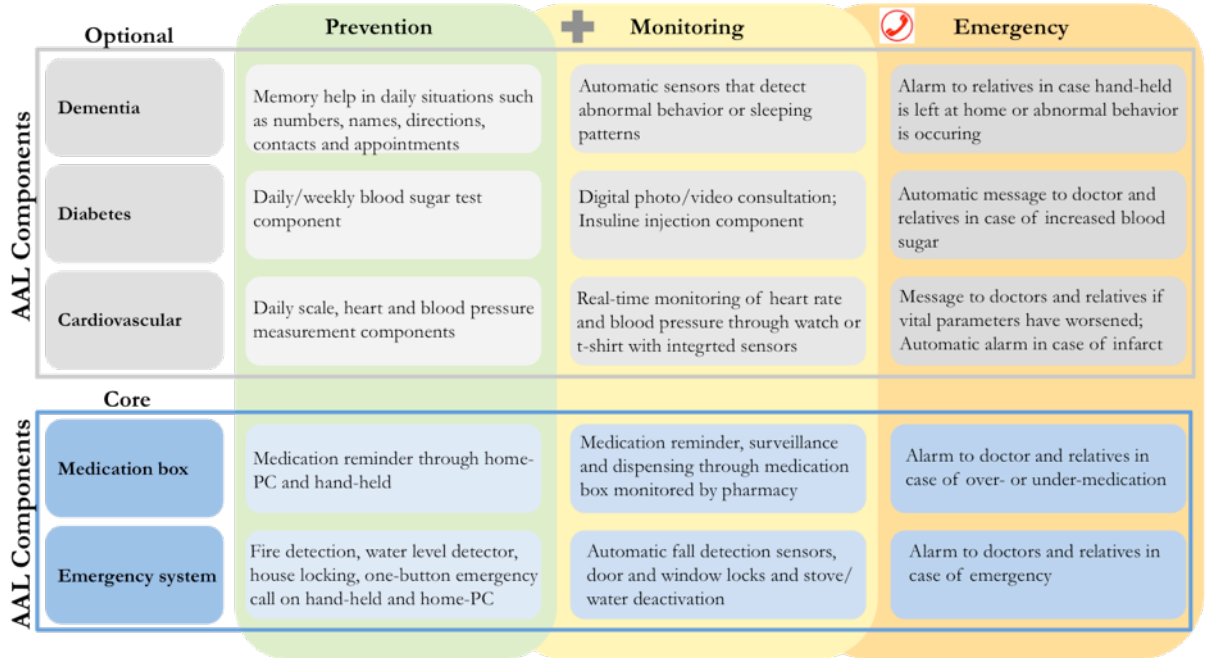


Figure 10: EasyLive component modules

The EasyLive system consists of an interoperable core system integrating information processes throughout the system architecture with two core components, namely the intelligent emergency system and the medication box, and additional AAL components which are dependent on the patient/user's disease and its severity. Hence, as figure 10

shows, the EasyLive system is a modular system that can be flexibly upgraded in case of increasing severity of disease. Its two base applications (emergency system and medication surveillance) cover important basic needs that all users incur, namely security through prevention of emergencies.

2.4 Supply Chain

EasyLive aims to interconnect all parties involved in the system architecture through standardized information flows from the patient/user to the AAL components (intelligent emergency system, medication box and specific components dependent on stage and specification of disease), to the interoperable core system, family members (if required/wished), the supervising doctor and to specialized service providers such as care takers, pharmacists or emergency care. All the information is also integrated into an online/mobile data system (online patient folder), which makes the transfer and comprehensive care of the patient easier and more efficient.

The high number of parties involved in the care taking of elderly people increases the complexity of information flows. Cooperation between the active parties and stakeholders is the key to ensure an efficient and foolproof interconnection and decision system. Hence we believe that the best strategy to develop this system is within a cooperation network of project managers, integrated IT and communication specialists (such as Swisscom or T-Systems), AAL technology providers, universities, research foundations, doctors and caretakers. The field test within a specific, representative regional area would realistically simulate the information flows between the parties involved.

2.5 Scenario

The following scenario exemplifies how EasyLive could support a classic elderly couple in their household throughout the three stages of typical illnesses.

Overview: Martin (78) and Linda (74) S. are married since 46 years and live together in a single-family home situated in a small village 15km outside of Zurich. Their only daughter, Teresa (42) lives with her family in another village approximately 10km away from them. The neighbour Sabrina (57) takes care of Martin and Linda whenever their daughter is on holiday

or out of town. Linda suffers from Diabetes since many years and Martin has a high blood pressure in combination with heart rhythm anomalies.

Prevention phase: Upon recommendation from his doctor, Martin decides to acquire the EasyLive system from a service provider. In addition to the core components consisting of an intelligent emergency system and a medication box, Martin is advised by his doctor to add the component "Prevention Heart and Circulation" which is then interconnected by a service provider to a home-PC and mobile handheld device. Martin now is reminded bi-daily by his handheld device to take his medication and measure his blood pressure and heart rate. In addition he can alarm emergency services from any location with his GPRS-supported handheld device. The interoperable core systems, namely the home-PC and the handheld device can be configured to transfer all or parts of the information to other parties such as their daughter, their neighbour and/or the supervising doctor.

Monitoring Phase: Martin suffers from a heart attack and is treated in the hospital for approximately two weeks. His doctor advises him to upgrade his "Prevention Heart and Circulation" component to a monitoring component, which controls his vital signs more frequently and in more detail. From now on he wears a t-shirt or a watch with integrated sensors monitoring his heart rate. Unfortunately, Martin is also diagnosed with an early form of dementia. His doctor advises him to add the "Memory Help" module, which supports him in daily tasks through reminder functions (appointments, medication, directions, etc.) built-in the home-PC and handheld system. Family members or neighbours are informed instantly if the handheld device is left at home when Martin leaves the house.

Linda's diabetes condition has also worsened. Linda has to go to the outpatient diabetes centre in Zurich once per week. Her doctor advises her to acquire the "Diabetes Monitoring" component, which allows her to both digitally photograph open wounds and measure her blood sugar at home. She can then discuss the results with the doctor online or by phone as the photos and blood results feed into the online core system through the home-PC. Consequently, Linda's daughter is relieved of the task of driving her mother to the outpatient diabetes centre once a week.

Treatment/Care/Emergency: After a few years, the Dementia has worsened. An upgrade to active sensor systems within the house (to detect problems of orientation, sleeping

disorders or accidents inside the house) is made. In addition, a pharmacy is now in charge of monitoring and refilling the medication box. Automatic alarm systems are in place to detect worsening vital parameters of Martin, as well as if he falls and has orientation problems.

3. Execution plan – Outlook

After setting up a cooperation network of project managers, industry partners, universities and research institutes, the development and testing of the archetypal processes and core components of the EasyLive system will begin, first in a laboratory-environment and later in a controlled clinical field study. This field test is highly important as it aims to simulate the EasyLive system under realistic conditions. Not only will the field study highlight the feasibility and challenges of an interconnected AAL support system, but also the satisfaction, problems and suggestions of our main customers, namely elderly people, their family members and care takers. Figure 11 shows the execution plan of the EasyLive project.

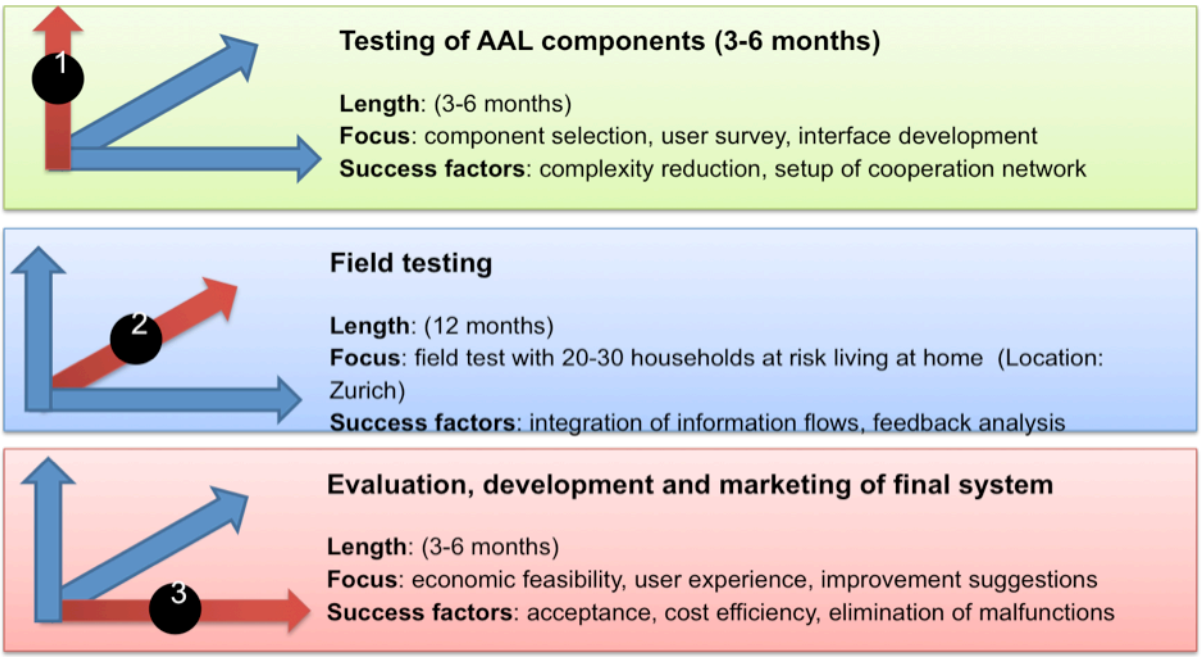


Figure 11: EasyLive execution plan

3.1 Field test description

We aim to test the EasyLive system with 20-30 households at risk of the three main illness fields covered by the program. The field test will take place in a representative region of Switzerland during a period of approximately one year. A core task in the field study will be

to set up the system architecture interconnecting all players and therewith creating a comprehensive supply and care chain for elderly people. The focus will be on acceptance, practicability, user-friendliness and ease of handling. The representative group of elderly users will be interviewed quarterly and improvements will be made instantaneously.

3.2 Cooperation network

As discussed previously, the cooperation between all players is the key to success. The EasyLive project is a pragmatic realization of an innovative and future-oriented vision to prolong elderly people's comfortable and independent life in their own domestic environment. In addition to that it will save costs for society and trigger further research and development as it aims to open up the AAL market to the masses. Hence, we believe that innovative and future-oriented industrial partners such as Swisscom, T-Systems or Philips could act as the main sponsors of a network of specialized AAL technology providers, universities, research institutes and project managers and profit from a first step into a large opening market. The technology and the needs exist, however, only integrated and interoperable systems suitable to the mass market (high demand, cost efficient) covering the whole service chain (from the patient to the doctor and care takers) will succeed. The development of such a system requires a collective vision and cooperative effort.

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(HSG)

Megatrend "Global Demographic Change": Tackling Business and Society Challenges in 2030 and beyond

Topic 9

The recently published Careum study on demand and supply for healthcare services in Switzerland forecasted a shortage of 200,000 healthcare professionals by 2030. You are in charge of tackling this challenge!

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November 2009

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Megatrend "Global Demographic Change"

Dr. Hans Groth

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1. Introduction

Demographic change and an ageing society caused by longevity and declining fertility rates will produce serious challenges for most of the western world in the 21st century. Specifically, in the next 20 years, Europe will see drastic changes in the age distribution pyramid as seen in the graph below. From its initial shape in 2001, it will shift to an almost inverse one in 2050 and this will heavily impact not only economic growth but also pension funds, social security systems, welfare and many other social fields.

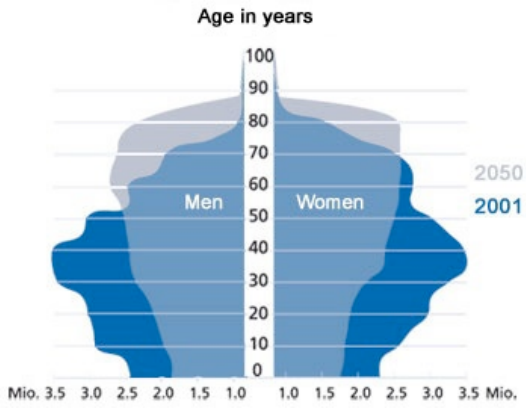

Figure 1: Population of Europe from 2001 to 2050
Source: Eurostat (2007) as cited in 7x4 Pharma (2009)

In particular, the dramatic increase in older people will challenge the existing health care systems that have to provide services for all of the elderly. This will require a complete revaluation of the current structure and organization. One of the most severe concerns facing health care industries is the looming threat of a massive shortage of health care professionals in the coming decades. In this paper, we will be looking at how all these problems pertain to the case of Switzerland.

2. Content and Structure

This paper addresses the question of how to master this major challenge of global demographic change and focuses on possible solutions for the health care system in Switzerland. It concentrates on health care reforms needed to meet the changing environment. Moreover, it will mainly focus not only on the question of how to provide high

quality health care services for the growing older generation in Switzerland, but also concerning the issue of improving the financing of the health care system.

The composition of this paper is as follows. At the beginning of Chapter 3, the basic facts about Switzerland are briefly introduced. Later in the chapter, the demographic situation of Switzerland is presented and the looming health care crisis is also explained. Chapter 4 presents the existing literature and research suggestions for possible reforms combined with our own thoughts. Furthermore, we present some new reform proposals in order to resolve the problem. In the last chapter, the main findings of the paper are briefly summarized and concluded.

3. Switzerland

Switzerland is a small, unique country nestled in the Alps in the middle of Western Europe. It is one of the only countries in the world functioning with a semi-direct democracy, and its federalist structure leaves each of the 26 cantons with an unusual amount of sovereignty. Four official languages are spoken: German, French, Italian and Romansch. The quality of life is ranked as one of the highest in the world[1]; people enjoy high salaries, a great education system, low crime rates, a healthy environment, as well as many other attractive conditions. Being one of the few European countries that is not a member of the EU, relations are managed through technical and bilateral agreements. One of the most important of these is the free movement of people agreement, which lifts restrictions on EU nationals wishing to work and/or live in Switzerland[2].

[1] **The Economist (2005):** *The Economist Intelligence Unit's quality-of-life index.* Retrieved October 27, 2009 from http://www.economist.com/media/pdf/quality_of_life.pdf

[2] **Federal Office for Migration (2009):** *Free Movement of Persons Switzerland* Retrieved October 19, 2009 from http://www.bfm.admin.ch/bfm/en/home/themen/schweiz_-_eu.html

3.1. Demographics of Switzerland

Switzerland's current population is approximately 7.7 million[3]. The growth rate of the Swiss population was once very volatile, but it is projected to stabilize at low levels in the coming two decades. The graph below shows the average growth rate for every five years starting in 1950 with projections up to 2030.

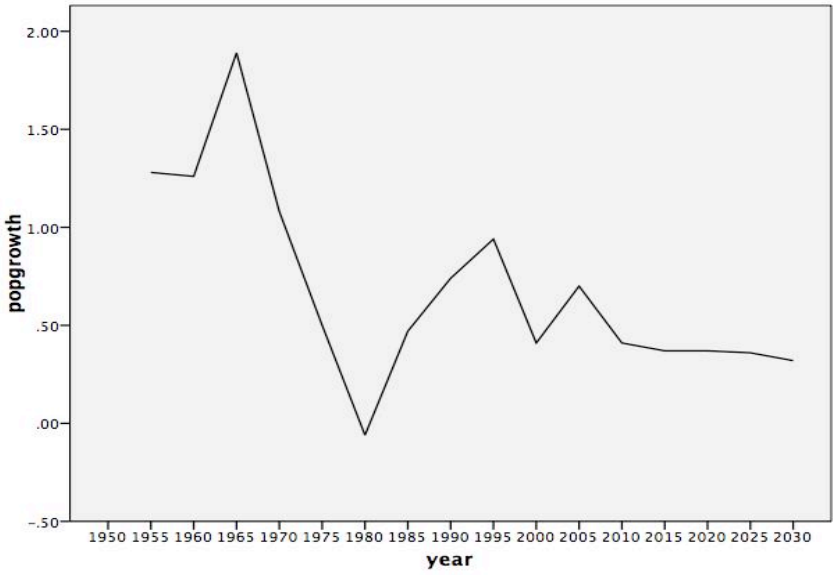

Figure 2: Population growth in Switzerland from 1950 to 2030
Source: UN World Population Prospects: The 2008 Revisions Population Database

It clearly depicts the Swiss baby boom, which happened around the 1960's, directly followed by a steep decline in the growth rate that bottomed out in the late 1970's at a negative rate. The total fertility rate (TFR) can provide some explanation for the above-mentioned pattern of the Swiss population growth rate. When looking at the total fertility rates (TFR), in the graph below, we see that in the 1970s the TFR dropped below the replacement fertility level of 2.1 (red line) at which a population exactly replaces itself from one generation to the next[4].

[3] **Federal Statistical Office (2009):** *Population size and population composition* Retrieved October 19, 2009 from http://www.bfs.admin.ch
[4] **Craig, J. (1994):** *Replacement level fertility and future population growth*. Retrieved October 27, 2009 from http://www.ncbi.nlm.nih.gov/pubmed/7834459

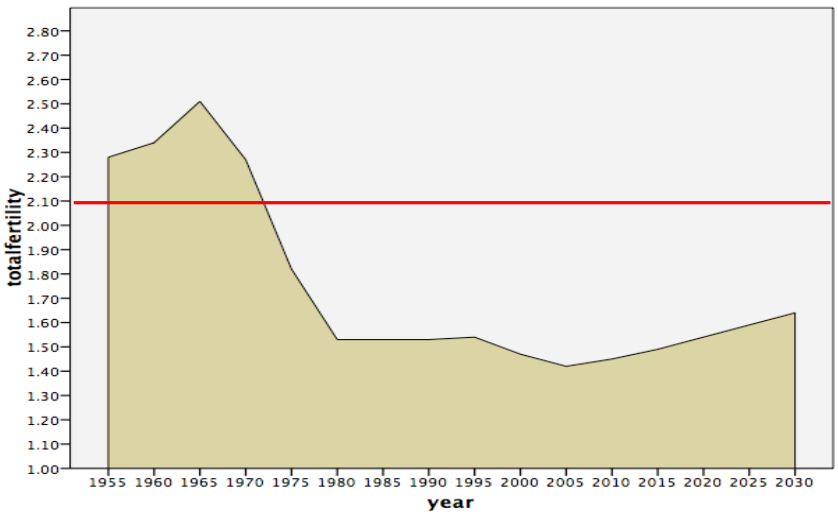

Figure 3: Total fertility rate in Switzerland from 1955 to 2030
Source: UN World Population Prospects: The 2008 Revisions Population Database

However, this only accounts for a partial explanation of the situation. Migration information is needed to explain the rest of the discrepancies. In the 1970's, in addition to the drop in fertility, Switzerland experienced negative migration[5]. This most likely resulted from limits imposed on immigration and the economic crisis. Migration has since been the biggest contributing factor keeping the population growth positive. There have even been slight increases in growth in the past years with 2008 registering a 1.4% growth rate[3]. This could be due to worse economic conditions in neighbouring countries, making Switzerland a more attractive place to work.

The increase in life expectancy is also affecting Swiss demographics. In the 1950s, life expectancy at birth was just about 69 years of age. Today it is around 81 years, and by 2030 it is expected to increase to 84 years of age[5]. This steady increase in longevity is coinciding with the baby boom generation's entrance into retirement. We will see not only the average age of society continuing to increase, causing a "graying" of the population, but more importantly that the age structure is shifting to what will increasingly become a problematic distribution.

[5] **United Nations Population Division (2008):** *World Population Prospects: The 2008 Revisions Population Database* Retrieved October 15, 2009, from http://esa.un.org/unpp/en/home/themen/schweiz_-_eu.html

As seen in the graph below, the change in the percentage of the working age population (the blue upper line) has fluctuated only slightly with a 6% decrease from 1950 to 2030 while the percentage of the population 65 and over (the green bottom line) has increased by 14.1% from 1950 to 2030.

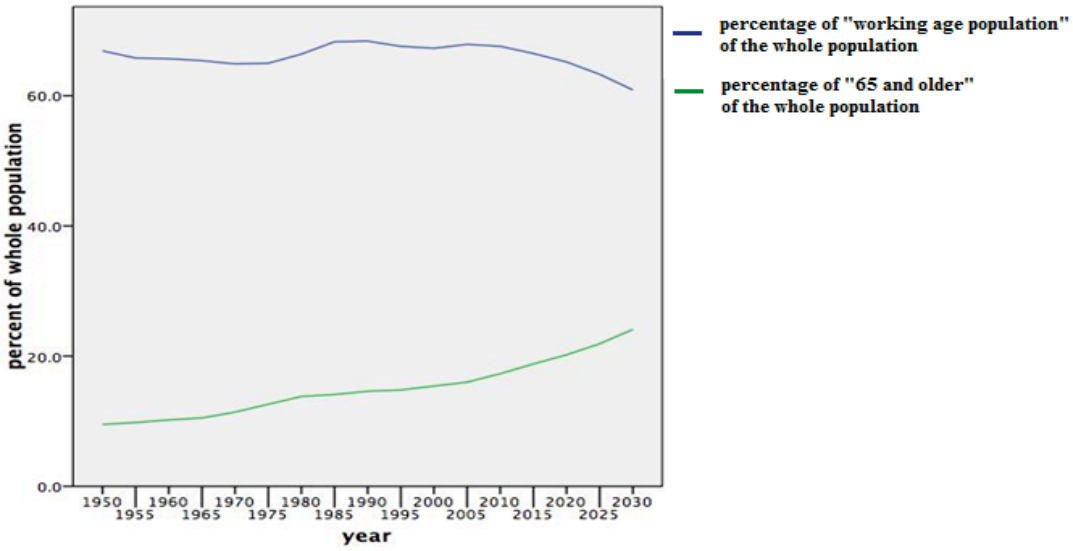

Figure 4: Population percentage dispersion in Switzerland from 1950 to 2030
Source: UN World Population Prospects: The 2008 Revisions Population Database

Assuming that older persons are more in need of care and therefore have to spend more money for health care, total health care expenditure of a society will rise and thereby possibly increase health care contribution rates. Simultaneously, the high number of elderly people requires a well functioning health care system. Personnel shortages and declining health care quality will possibly be the consequence of an increase in the number of people in need of care and a decrease in the labour force.

3.2. Looming health care crisis in Switzerland

Recent studies by the Careum Foundation and the Swiss Health Observatory have indicated that by the year 2030 Switzerland can expect to face major shortages of workers in the health care sector with estimates ranging from 120,000 to 190,000.[6] There are two reinforcing

[6] **Ruedin, H.J. & Weaver F. (2009):** Ageing Workforce in an Ageing Society: How many health professionals will the Swiss health care system need by 2030? Careum working paper, 2009, 1.

causes for a needed increase in health care personnel. First, due to the demographic shift there will be an increasing number of personnel who will leave the workforce due to retirement. Second, there is an increased demand for health care services and personnel due to the increased ageing population[6]. In the graph below there is an illustration of the above-mentioned reasons of the increased required long-term care personnel for Switzerland by 2030.

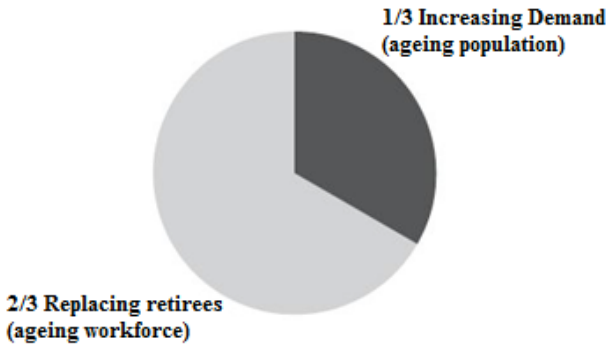

Figure 5: Required health care personnel for Switzerland
Source: Ruedin & Weaver (2009, p. 14)

So, how can we ensure that this number of personnel will be achieved? Some analysts argue that immigration can help mitigate the problem. However, one of the biggest concerns is that Switzerland is already reliant on foreign workers to fill in the demand gaps, especially for hospital and long-term care personnel, with up to 40% of staff being represented by foreign workers[7]. This practice may at first appear like a very feasible solution, but in fact it is highly unsustainable. As described above, migration rates can fluctuate for a number of reasons, especially due to economic circumstances. Therefore, if for any reason conditions worsen in Switzerland, or become better in other countries, Switzerland will not be able to maintain or attract new foreign workers. Language barriers further limit the likelihood of finding replacement workers in other countries. In addition, there are ethical concerns to this practice considering that most western countries will also experience health care worker shortages of

[7] **O'Dea, Clare (2009):** Crisis looms for Swiss Hospitals. Retrieved October 27, 2009 from http://www.swissinfo.ch/eng/news_digest/Crisis_looms_for_Swiss_hospitals.html?siteSect=104&sid=11172320&cKey=1252568875000&ty=st

their own. Consequently, we are convinced that a further and more flexible reform of the health care sector is absolutely necessary.

4. Reform suggestions

This chapter outlines literature and research arguments combined with our own thoughts and solutions concerning the question of how to change and reform the health care system so that it can withstand the inevitable demographic shift in Switzerland. Furthermore, we present some new and independent reform suggestions. This section answers both the questions concerning how to provide all of the increasing number of ageing people with a functioning health care system and how to help finance this system. Not only can reducing costs help fund reforms, but we feel that the large amount of cost inefficiencies are directly related to productivity inefficiencies. In most instances, if we can find ways to save costs, we are also highlighting areas where productivity can be increased. If cost savings can be achieved to a high degree then we could increase the supply of health care labour by providing higher salaries, benefits and other privileges to convince the Swiss population, especially those working in other industries, to enter and/or stay in the health care industry. This is why our recommendations provide solutions that address the direct inefficiencies of the system and outline areas of potential health care cost reduction, as well as explain some technological innovations and breakthroughs that could both reduce the labour demand and save costs. At the end of this section, we will also follow with some interesting recommendations based on technological innovations and breakthroughs.

4.1. Health care delivery and organizational suggestions

Improving working conditions and remuneration policies

The medical industry is known for its stressful working conditions and as a result it experiences a high level of drop offs. So, how can the work atmosphere and conditions be made more favourable for long term employment? In 2006, women represented 78% of all workers in the hospitals and 92% of all personnel in retirement and nursing homes[6]. It is implicit that many of these women at some point in their career will decide to have children. After having children, many women do not return to work. If the industry would be more

flexible concerning hourly demands and schedules, and made it easier to re-enter the workforce, then perhaps more women would like to go back to work. Also, if men were allotted maternity leave benefits, it might free up more women to go back to work sooner too. Furthermore, one of the biggest attractions of the medical profession, aside from the prestige, are the high salaries. If salary schemes could be put more in balance, this could reduce the constant pressure to lower salary rates and could prevent the health care workers from transferring to another industry where the average remuneration is higher. In addition, improving working conditions is quintessential for the reduction of drop offs by ensuring that the health care industry remains attractive for future employees. There are many small changes that could be made to make daily work life more amiable for health care workers and relieve their stress on the job. In sum, once the improved working conditions and better remuneration policies are in place, the problem of a shortage in health care personnel might be mitigated.

Improvements in the Swiss medical education system

There are a number of conditions in the Swiss medical education system that contributes to the difficulties of producing sufficient numbers of health care workers. The first of which is the numerus clausus system. In essence, it is a system that limits the number of students that can be accepted to medical universities in the German speaking part of Switzerland. If this system were to be abandoned or if the quota were greatly increased, it would ensure a higher number of graduates flowing out of the system. This would alleviate the problem of the shortage in health care professionals, but it also begs the question: how would we accommodate more students without sacrificing the quality of education? While perhaps a costly answer, building another medical school, in addition to the mere five that currently exist in Switzerland, would solve this problem. However, considering the high costs associated with building another medical school in Switzerland and the fact that health care personnel will be most needed for low-level positions, we came up with an idea regarding the recruiting of international students who study medicine or health care at their home universities. The next section highlights further details related to this issue.

International student training/internship program

After closely examining the U.S. government program "Work and Travel", which provides opportunities for qualified international students to work in the United States temporarily (up to 6 months) we decided to emulate it in Switzerland for "rejuvenation" of the health care industry. It is a great idea to give a chance to international students from all around the world who study medicine or health care at their universities to take part in a training/internship in a Swiss hospital, medical centre or nursing home for a period of up to 6 months. First, the students will be eager to come to Switzerland and be able to practice in the local health care industry. This means that they will be highly motivated and can even contribute to a better quality of low-level health care. Second, they will decrease the deficiency of low-level clinical personnel. Third, they will be relatively inexpensive for the system because they have already received most of their education abroad (not paid for by local government). However, such an approach can only be temporary because in the coming years more and more countries will begin to experience deficiencies in their health care personnel. These countries will be competing with Switzerland for all of these capable young students, which indicates that this solution is not completely sustainable.

Mini Clinics

Another possible health care delivery solution is the introduction of mini clinics in local communities. Mini clinics are a type of express clinic, which are designed to perform some routine tests, screenings and write prescriptions[8]. The aim of these clinics is to bring basic routine medical and preventive care closer to the public at a reduced price[6]. In Switzerland, it could be done as follows. First, mini-clinics can be established inside of the main drug stores; the reason being that people would have to know only where the closest drug store is. Since most people already know the location of their nearest drug store, it will be much easier to find the mini-clinic. Another reason is that once they are prescribed medicines from the personnel of the mini-clinic, people can get the drugs needed right away from the drug store.

[8] **Lewis, L. (2007):** *Mini-Clinics are Coming*. Retrieved October 11, 2009 from http://www.blisstree.com/healthbolt/mini-clinics-are-coming/

Therefore, people save time in travelling, which ultimately means that more time can be spent at work. Hence, people can make more money at work and this provides a higher amount of income tax funds for the government. The government can then use these additional funds for health care solutions for the increasing number of ageing people. For instance, the government can provide higher remuneration for the recruitment of additional and more professional health care personnel. Moreover, the mini-clinics are cheaper than emergency rooms and can even lower the health care costs by servicing those patients who are seen in the emergency room for a condition that a regular doctor could have also treated. These cost savings could be used to provide a financial stimulus to attract more people to work in the health care industry.

Health Care Service

A possible approach for Switzerland could be to implement a mandatory public health care service for everybody, related to the already existing mandatory military service for men. The current situation is that every Swiss male aged 18 has to serve mandatorily for a certain period in the army or, in the case of somebody having health problems or moral issues concerning the military service, in an alternative civilian service.

The current system could be amended the following way. Swiss men and women aged 18 would have to choose between serving for a certain time in the army or in the health care sector. Persons who serve in an alternative civilian service would also be allocated to fulfilling health care duties. As a result of this amendment, sufficient health care personnel could be ensured at a reasonable cost. This system would provide many people who could perform lower health care services and thus support the existing and skilled health care personnel. This would be a solution for the potential problems of a personnel shortage or a cost explosion. A personnel shortage could not occur since many people would be made available due to this implementation. Moreover, it might possibly lower the health care costs since many of the mandatory serving people at the age of 18 only get paid around 1,700 Swiss francs per month

by the government during the time they serve. This is less than what educated care personnel would earn for the same lower care services that need to be done.

A good solution for this issue might be the possibility of an alternative compensation payment in order to avoid the military or health care service. In our scenario, people can choose either to serve in the military, in the health care sector or pay a service-waiver fee. In fact, the possibility of such a fee or payment would lower opportunity costs and be very efficient for the entire economy. People with a higher wage would probably choose to pay the alternative compensation payment and people with a lower wage or without a job would choose to serve in the army or in the health care system. Additionally, students would have the possibility to take a break from studying and acquire some work experience. Moreover, such a social service could obtain a broad acceptance in the society since the young people would know that they would also be dependent on the same service later in their lives.

However, such a change would be very difficult to implement taking into account Swiss democracy and realistically speaking, the politicians would not even consider it. However, this is still a viable option that can be put on the table if there are no other better ways to support the Swiss health care system from the threat of the demographic shift.

Retirement colonies for older people

Another possible reform could be that the Swiss government establishes retirement colonies for older people and runs them according to the original costs without having any profit in mind. For this reason, total costs per person would decrease and health care delivery for older people could be ensured. Costs could be decreased because the dimension of these public retirement colonies would exceed a critical size that would allow them to benefit from economies of scale and scope. Once again, these savings can be allocated to better health care for the increasing ageing population. In addition, the “productivity” per health worker would increase because a relatively small number of doctors and health care personnel would take care of a larger number of old people in the retirement colonies. For this reason, we

believe that the retirement colonies for older people would alleviate the deficit in health care personnel.

Postponing retirement

While Swiss citizens tend to retire later than their official retirement age requires[9], this is not the case in the medical profession. In fact the Careum working paper reports that early retirement is very common in the health care sector[6]. With an expected shortage of workers, giving incentives to medical workers to stay in their careers longer would be a simple way to create a major impact. One possible way to accomplish this could be to establish sabbatical programs, allowing doctors and other medical professionals to have a break from work, while not technically interrupting their employment. Not only could this help with early retirement rates, but also could contribute to reduction in the number of dropouts and would be seen as an incentive to enter the health care field.

Health promotion and Diseases Management Programs (DMP)

Health promotion is a process that allows people more control over the ability to improve their health. The better the health is of the general population, the lower the health care costs are and the need for additional health care personnel. As this applies to a country like Switzerland, the focus would be on providing the best education and information regarding how one can live life to one's fullest health potential. Although it is most effective when started at an early age, there are also benefits to keeping older people involved in this process. Exercise and diet management can play an important role in keeping older people healthy longer, therefore delaying long-term care. The Careum working paper: "Aging Workforce in an Aging Society" emphasises the importance of this possibility. It reports that if it were possible to delay long-term care by one year, the required number of personnel to be recruited would drop from the range of 120,000-190,000 down to 50,000[6]. Currently,

[9]**Eberstadt, Nicholas and Groth, Hans MD (2007):** *Europe's Coming Demographic Challenge – Unlocking the Value of Health*, p.50. Retrieved October 12, 2009 from http://www.gmfus.org/doc/Eberstadt-Groth%20English%20edition%20FINAL.pdf

Switzerland has a health promotion system, but it is only focused on weight issues and work place health.

Disease Management Programs (DMPs) are a system allowing patients with chronic illnesses to meet in small groups to discuss, learn about and manage their diseases. These programs can be administered by health professionals or also by trained patients with chronic diseases who operate under the guidance of a manual or something similar. They serve as support groups for patients and teach methods for dealing with stress and the frustrations associated with the disease. By building up confidence and knowledge, disease management programs potentially allow for more successful care of chronic illnesses. Studies have produced inconclusive results regarding the cost savings for such programs. One study found, for example, that there has been evidence that patients with congestive heart failure have reduced hospital admission rates; and overall health care quality and disease control were improved[10]. On the other hand, patients that were diagnosed with depression have shown an increase in costs related to patient care and prescription costs. Results can vary greatly depending on the type of condition being treated and the quality of the program. If Switzerland were to implement DMPs, and public and health care officials were to be extremely meticulous about the organization, there seems to be enough evidence to suggest that there could be a potential benefit for the health care system.

Call centres

A medical call centre is a service that allows a patient to speak with medical professionals directly, over the phone, to ask for medical advice ranging from minor questions to medical emergencies. It allows a patient to get specific answers, almost immediately, without any travel time or expenses required. The information received is more specific than advice one

[10]**Mattke S, Seid M, Ma S. (2007):** *Evidence for the Effect of Disease Management: Is $1 Billion a Year a Good Investment?* American Journal of Managed Care 13:670-676. Retrieved October 13, 2009 from http://www.ajmc.com/media/pdf/AJMC_07dec_Mattke_670to76.pdf

could find through an online search, and more convenient than disturbing your regular doctor who has less time to take phone calls and may be less equipped to consult in this manner.

There are two major call centres in Switzerland, Medi24 and Medgate. They have both been in existence for about 10 years. Being well developed, they are able, through economies of scale and scope, to deliver quality medical advice quickly. For example, Medi24 can handle 3000 plus calls per day. Doctors and nurses are able to handle within minutes what would otherwise consume much more time by a normal face-to-face consultation. Some of the over-the-phone consultations can settle an issue or concern with cheap solutions, saving costs that would have been incurred if the patient chose to visit a doctor's office or hospital. Although extensive studies have been carried out, it is difficult to measure the cost savings of such a service[11]. While keeping unnecessary patients out of the doctor's or emergency rooms has obvious cost benefits, the ease of use may contribute to more consultations than would otherwise be necessary. Regardless of the moral hazard issue concerning the usage of the call centres in Switzerland, there is a clear potential for a reduction in the overall costs, which can help support the Swiss health care system from the threat of a demographic shift.

4.2. Cost-related suggestions

Innovative health insurance and a cost-effective system

An innovative solution based on a limitation of high medical technology can be implemented in the current health insurance system. As enormous health care costs are highly associated with the application of the newest and top-notch technology and medical devices, Zweifel recommends creating special options in the contract with the health insurance companies[12]. In such an option contract, the insured agrees to abandon the use of the newest medical technology from a certain age on and would be satisfied with established technologies that

[11] **Brügger, Urs Dr. oec et. al. (2005):** *Gesundheitsökonomische Beurteilung der Telefontriage-Dienstleistung* Winterthurer Institute für Gesundheitsökonomie

[12] **Zweifel, P. (2001a):** *Alter, Gesundheit und Gesundheitsausgaben – eine neue Sicht.* G+G Wissenschaft, 2001, 1.

are less expensive than the newest alternatives. In return, the assured gets offered a reduced insurance premium. Of course such a solution also implicates some disadvantages. For instance, it might happen that older people being on the brink of death would change their minds and wish for the application of the most modern technology. There might be even a regret in signing an insurance contract with the respective constraints. However, the argument could be countered by saying that a concerned person by paying a reduced insurance premium is therefore able to set aside a larger amount of money which could be invested over the years and used to cover any future treatment expenses. This new system makes cost savings, which can be used to tackle the deficit of health personnel or the increasing number of ageing patients.

"Paperless" bureaucracy

Technological and IT development plays a pivotal role in reducing health care costs. In our view, the introduction of technological innovations in the health care industry is a win-win situation for everyone in the Swiss health care system. A great idea is to eliminate all paper communication (letter correspondence) between the health care providers, insurers and customers. We would like to give a very simplified example of how a small change can have a great impact. In Switzerland, the insurance companies still send monthly bills and other information on paper by post. Currently, these bills are usually 1-2 page A4 format paper sheets, which are sent every month. By using the online productivity colour printing calculators of different printing companies we found out that on average one colour printout page costs companies at least 0.06 Swiss francs per page taking into account only a 10% coverage area and including depreciation of the printing devices[13]. As indicated on the website of the Swiss post, the average cost of postage for a letter is 0.53 Swiss francs for bulk mailing and reduced corporate prices[14]. A letter envelope is at least 0.01 Swiss francs for large quantities. Furthermore, if it takes roughly ten working hours more for the "paper"

[13] **Hewlett-Packard (2008):** *Printing with color: the cost of print.* Retrieved October 28, 2009 from http://www.hp.com/cgi-bin/sbso/productivity/color/print_cost

[14] **Die Schweizerische Post (2009):** *B-Post Massensendungen.* Retrieved October 28, 2009 from http://www.post.ch/post-startseite/post-geschaeftskunden/post-briefe/post-briefe-versand-national/post-briefe-b-postmassensendungen.htm

correspondence per company per month, and there are around 90 insurance companies in Switzerland,[15] and when considering a low-end wage of twenty Swiss francs per hour, this means that the labour cost is around 18,800 Swiss francs per month or 225,600 Swiss francs per year. Moreover, if a person receives one 2-page letter per month from his/her insurance company, then 0.60 Swiss francs per person per month is the cost only for communication between the insurance firms and their customers. If there are around 7.7 million people in Switzerland[3] while making an adjustment for around 1.2 million retired people, and also consider the most conservative scenario of one-insurer per family, then this means that around 1.9 million letters are sent each month. This clearly shows that roughly 1.16 million Swiss francs per month can be saved if an electronic payment notification is used. Subsequently, it shows that all economic costs that can be saved per year come close to 13.92 million Swiss francs. Once again, these cost savings could be used for providing a financial stimulus for attracting more people to work in the health care industry.

Centralization of systems

A large amount of the health care costs in the current system are coming from the overlapping and ineffectiveness in the communication systems between different hospitals, health care centres, emergency rooms, and health care data centres. Centralization brings more efficient, standard and uniform systems and processes across the overall health care organization[16]. For example, if in a given region there are different and independent software providers and data specialists for every different health care entity, then very often the costs can be considerable. However, economies of scale and economies of scope can occur if one unified data system is implemented. There will be less problems and time lost in transferring and adjusting information for the different databases. The savings can also be considered significant per year as optimization will be better and depreciation costs will also be lower (e.g. reduction of the database centres in a given region from 10 to 2). Once again, these costs

[15] **Comparis.ch (2009):** *Krankenkassen-Prämien vergleichen.* Retrieved October 28, 2009 from http://www.comparis.ch/krankenkassen/default.aspx

[16] **Buxbaum, P. (2006):** *VA's health IT gamble*. Government health IT. Retrieved October 15, 2009, from http://www.health.mil/mhscio/downloads/article350199-1.pdf

savings can be used for better health care services or providing higher remuneration for recruiting more personnel.

4.3. Technological breakthroughs

Automated 24/7 health centres (AHC)

Another interesting solution that we came up with is the implementation of special 24/7 automated health cabins or centres which will have direct audio/video-connection with 24/7 regional health hubs. In essence, this automated health centre, or as we call it AHC would be a place, more or less like the Automated Cash Services provided by banks, where a person can withdraw or deposit cash, exchange currencies, and self-manage all her/his bank accounts at any time of the day or night. AHCs would be located in central and easily accessible locations in a town or city and some of the health diagnostics could be done right away. Possibilities are that an AHC could have a temperature detector, integrated blood testing and urine testing devices, heart rhythm and heartbeat measuring devices, etc. As the graph below shows, all the information would be processed automatically at the AHC and then sent via Internet to the regional health hubs. The regional health hubs might be a place where a health professional receives the information from the AHC and by analyzing it and asking the user additional questions are able to make a quick, professional and inexpensive diagnosis via audio/video-connection.

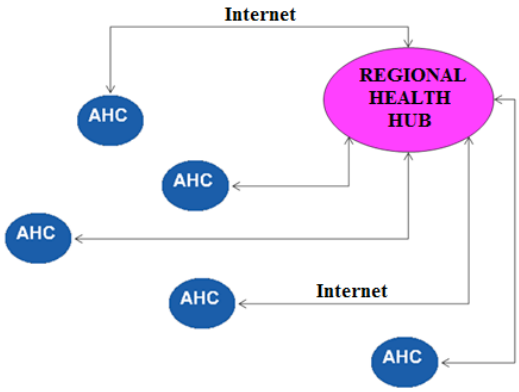

Figure 6: Structure of Automated 24/7 Health Centres (AHCs)

Furthermore, for security reasons, a given user can enter the AHC compartment only by swiping his Social Security or Health Insurance Card. Thus, in our view this would be a very efficient and cost saving way to reduce the number of people who use expensive emergency rooms at hospitals. The cost savings could be used to hire additional hospital or day-care personnel in Switzerland.

Home mini-clinic equipment (HME)

In the previous suggestion, we considered that people have a certain state of health that enables them to go to the Automated Health Centres. However, we ask: how about old people who need daily health supervision and are not able to reach the AHCs? When considering that most of the overwhelming costs for looking after old people stem from the daily treatment in nursing homes, we ask the question as to how the productivity of the current system can be increased? The obvious and easy-to-implement solution is to take people out of the nursing homes and provide them with equivalent immediate high quality assistance. We believe that with technological progress on our side, it might be possible to build a Home Mini-clinic Equipment (HME), which is a user-friendly device for old people staying at home. The system will be used for various kinds of diagnostics of the patient and will send the information directly to specialized centres via the Internet where it can be analyzed and decided upon. This solution solves two problems at the same time. First, we have all heard of the expression “my home is my castle” and a lot of old people would prefer to stay in their homes because of sentimental reasons. Therefore, by providing an HME to more old people, they would be happy to stay at home. Second, there would be less incentive for moral hazards in using an emergency room for every possible discomfort. Typically, old people, even when not being a hypochondriac, are aware that every discomfort can become very complicated and want to be admitted to the emergency rooms whenever such conditions arise. Most of the time, old people just need a quick and accurate test and advice from a professional. So, an HME could calm old people by making the vital test right away and sending the information to the person at the specialized medical centre who can respond quickly via the Internet. Furthermore, once the production of the device is in place and there are ever-increasing orders for it, there will be economies of scale and competition among

producers, which would ultimately bring down the price of the product in the long run. In sum, the Home Mini-clinic Equipment would help to reduce the number of required day-care health personnel and it would also save money by reducing the number of people who attend the emergency rooms.

5. Conclusion

This chapter outlines the increasing longevity and declining fertility rates that are leading to an ageing society and a demographic change in Switzerland. This demographic change worsens the impacts of already existing inefficiencies in the current health care system. Therefore, we are convinced that a reform of the existing health care and long-term care systems is necessary and urgent. In order to help determine which of our recommendations are more feasible we have placed them on a matrix as seen below.

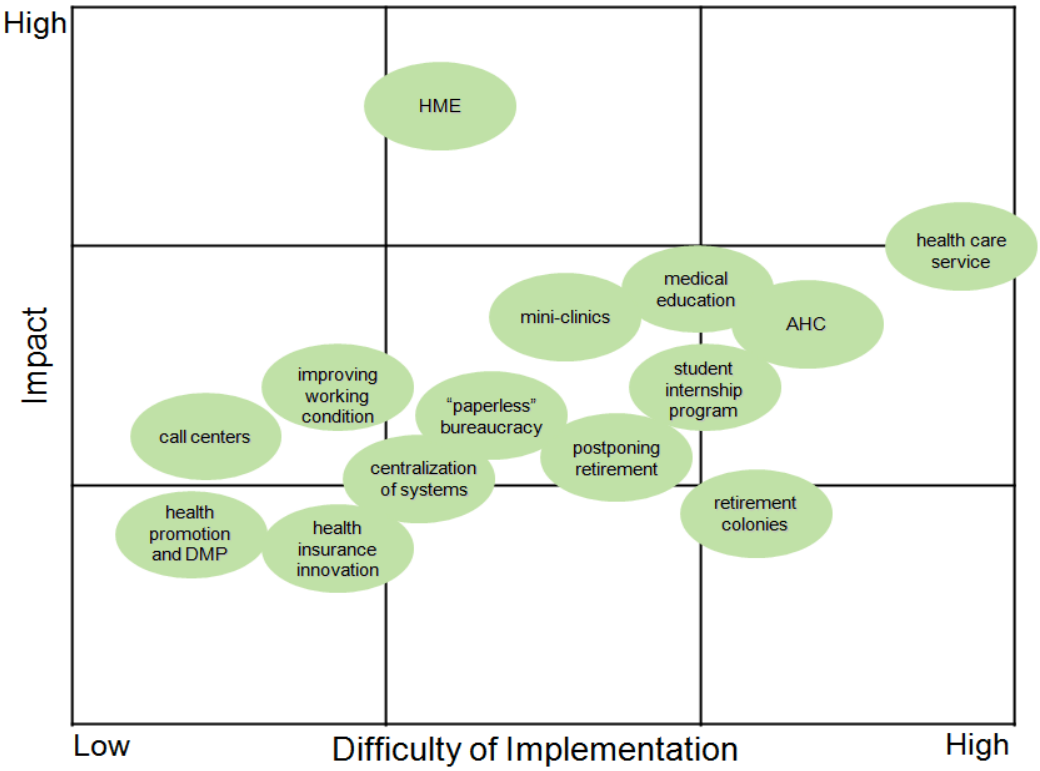

Figure 7: Impact/Difficulty of Implementation matrix

The matrix measures the estimated impact of a reform as well as the estimated difficulty in implementing it. The reforms that we would recommend to pursue are in the top left four

boxes. They include the home mini-clinic equipment (HME), mini clinics, postponing retirement, “paperless” bureaucracy, centralization of systems, improving working conditions, and call centres. These recommendations offer a relatively high level of impact, with fewer implementation complications. It is important to note that most of these recommendations only offer a medium level of impact. In order to achieve a maximized impact, we suggest that these recommendations are taken in some sort of combination. In our view, an isolated single approach is far from sufficient for dealing with the demographic health care problem. In conclusion, while some of these reform recommendations appear difficult or heterodox, it is important to keep in mind that the impending demographic changes will require a reorganization of society’s basic organization principles. Therefore, immediate action is absolutely crucial for mitigating the future societal costs.

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