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on Demographic Challenges

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

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at the University of St. Gallen, Switzerland
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Table of Contents

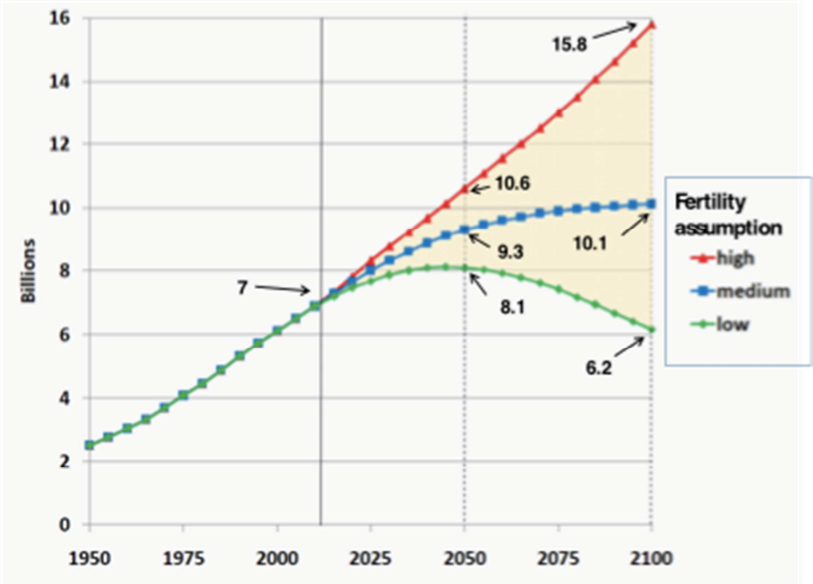
Introduction & Rationale

For the third year in a row I have had the privilege to teach at the University of St. Gallen (HSG), within the „Context & Reflection" curriculum, a Masterclass entitled: "Megatrend Global Demographic Change – Tackling Business & Society Challenges in 2030 and beyond".

In terms of addressing these challenges, 2011 was a special year. In October the world welcomed its seven billionth inhabitant. From a historical perspective, that milestone was reached in a very short time: it took over 50,000 years for the world population to reach its first billion, but the last two have been added in barely 25 years. Even if the speed of population growth continues to slow down, as it has done since the 1960s, the world population is likely to continue rising over this century. The United Nations projects that by 2050 the world population may be anywhere between 8.1 and 10.6 billion.

The future size of the world population depends greatly on the speed of fertility decline in developing countries, in particular, among those that still have very high fertility. The figure below shows UN estimates of the future world population based on low-, medium-, and high-fertility assumptions. If the world population surpasses 10 billion by 2050, it will very likely add several additional billions by the end of the century. To avoid that outcome, the 2050 population should remain close to 9 billion. Actions taken today can shape the path that fertility follows in the future and, in the process, can improve the lives of millions of women, their children and their families. In addition, speeding up the reduction of fertility in high-fertility countries will trigger changes in the age structure of their populations that are beneficial for their development.

UN Projections of World Population under Three Fertility Assumptions



Source: United Nations Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision, http://esa.un.org/unpd/wpp/index.htm

Taking action to reduce population growth is all the more urgent because rapid population growth can magnify nearly every global problem that is scaled by population numbers.

Therefore the Global Agenda Council on Global Population Growth of the World Economic Forum (WEF) agreed on several critical demography challenges which have to be addressed and subsequently tackled by the public agenda in this century[1].

First, although experts agree that there is sufficient food to feed everyone today, important changes need to take place to ensure food security for an additional two or three billion people, especially if increases in demand are driven both by larger numbers of consumers and potentially rising incomes.

Second, higher numbers of people will likely increase the impact of climate change, both because a larger world population would have a greater effect on global warming even if low rates of economic growth prevail and because the most vulnerable countries have the fastest growing populations and are already finding it difficult to adapt to the consequences of climate change.

Third, high population growth driven by high fertility has made it more challenging for developing countries to reduce poverty. Low-income households tend to have higher numbers of children which strain the capacity of both governments and families to provide them with the food, shelter, education, health and basic services they need.

Fourth, there are ongoing demographic shifts, such as urbanization and population ageing that will transform economies and societies fundamentally. If rising urbanization in countries that are still largely rural is not to be detrimental, it needs to be accompanied by job-creating economic growth and adequate planning. The financial resources required to promote successful urbanization are more likely to be strained if services have to be provided to a rapidly growing population.

Fifth, high fertility increases the health and mortality risks of women and children, especially if they are poor. Maternal mortality depends on the number and timing of the pregnancies a woman has over her lifetime. Further, each additional child lowers the ability of mothers and families to take care of and invest in each child.

Sixth, is another unprecedented challenge, but this time in the developed world,which becomes increasingly tangible and threatens an ever greater impact. It is the triad of “chronic” below replacement fertility levels, shrinking working age populations and ongoing trends of further increases of life expectancies or demographic ageing. Western population structures will definitely shift within the next decades – but how will it be possible to maintain economic growth, sustainable social structures, luxurious social welfare systems, pensions and unrestricted healthcare funding? There is no doubt: these are critical factors which have already become critical in Japan and apparent in healthy old Europe. Sooner or later this “triad” will challenge the competitiveness of the economies in the developed countries, the highly-touted stability of their civil societies and finally also the acquired wealth of their citizens.

These are the terms of reference we all have to face in the 21st century. Managing these obstacles also includes that leaders of today have to prepare the leaders of tomorrow accordingly and properly.

This is the ultimate rationale and my personal motivation to give this class.

[1] http://www3.weforum.org/docs/WEF_GAC_SevenBillionGrowing_Report_2012.pdf

In total, 24 students from 9 countries (Argentina, China, Croatia, Germany, Russia, Switzerland, Taiwan, Turkey, and the UK) embarked in my class. This energizing diversity truly reflects a “global platform” that has gathered, not only to work together under academic principles, but also to fuel the arising demographic challenges with fresh thoughts from different cultures and backgrounds.

The task given to the students was to prepare an academic paper which they had to defend in a presentation in front of the whole group. The 11 themes offered to the 2011 class were:

1. **Demography meets Food Security**
   How to solve the apparently insoluble - Sustainable food security for a population of 10 billion without recourse to Thomas Malthus

   - Review the latest UN population forecast, describe patterns of food security since 1980 and predict demand till 2030.
   - Where are the challenges? Develop strategies to cope considering the critical role of product innovation vs. process innovation.
   - Review the theories of Thomas Malthus and critically appraise if he is finally right or wrong in 2030.

2. **Demography meets Democracy**
   Impact of accelerating demographic ageing in Western societies on political space and social sustainability

   - Introduce Europe’s demographic and social shifts, private incomes and pensions over the time period 1950 – 2030.
   - One of the dimensions of this shift is a limit up to which intergenerational transfers are feasible and accepted by the civil society. Over the past 30 years in many Western democracies the income of retirees has progressed faster than that of the working age population. This transfer is financed either by growing debts or it is tax-financed by a shrinking working age population. However, how long will it take to explode?
   - Describe this development for Europe, include each country’s political climate and then compare this “stress factor” between the European countries. Elaborate their choices!
   - Review and draw conclusions from the work of the French economist Christian Saint Etienne.

3. **Demography meets the Dependency Ratio**
   The future of the “Dependency Ratio” as a planning tool for states, societies and businesses

   - Prepare a literature review of this ratio and discuss its strength and weaknesses.

- Analyze, for selected OECD countries, the evolution of life expectancy at birth, healthy life expectancy at the age of 60, years of retirement and years in taxable employment.
- For the same OECD countries, analyze the social transfer budgets and their sustainability by applying the conventional “Dependency Ratio.”
- Given the ongoing demographic shifts, is this ratio still helpful or do we need different tools which take the achievements of better and longer health into account?

4. **Demography meets the Demographic Dividend**
   “Demographic Dividend”, has it, and will it continue to keep its promises?
   - Prepare a literature review of this ratio, discuss is strengths and weaknesses.
   - Identify past country examples where either the forecasted demographic dividend paid or not.
   - Identify countries with emerging youth clusters and discuss if the “demographic dividend” is likely to occur.
   - Elaborate prerequisites where this ratio can be applied successfully and describe conditions where the predictive value is limited.

5. **Demography meets Japan**
   Can a shrinking and ageing society maintain wealth and economic growth?
   - Analyze the demographic history and develop a demographic forecast (till 2030) for Japan.
   - Develop a plan of action which takes Japan’s culture, habits, skills and political structures into account.
   - Is Japanese culture a driver or a bottle-neck?
   - Speculate what the rest of the world could learn from Japan in terms of managing this demographic “stress test”.

6. **Demography meets the Korean Peninsula**
   The demography of South Korea vs. North Korea, truly unequal twins
   - Describe the demographic evolution of both states since 1950. What have been the drivers for change?
   - Compare health, education and economic indicators.

- What is the forecast for 2030 and what are the implications from a political, social and economic point of view?

7. **Demography meets Emerging Markets**
   China vs. India who will win the race?

   - Describe the demographic evolution of both states since the 1970s. What have been the drivers for change?
   - Identify the challenges and opportunities for both countries.
   - What is the forecast for 2030 - 2050 for both states and what are the implications?
   - How will their rise and future forecasts effect the global order in terms of the political, economic, environmental, and investments perspective?
   - Where would you invest and why?

8. **Demography meets the Alpine Region**
   The case of the Canton Grison, CH

   - Describe the demographic evolution of the Canton Grison since the end of the 19th century. What have been the drivers for change?
   - Use the Canton Obwalden as a reference/benchmark for comparative analyses.
   - What is the forecast for 2030 and what are its implications?
   - Depopulation: What will it result in?
   - Repopulation: What is the benefit from an ecologic, economic, and societal perspective?
   - Make an innovative proposal “healthy, wealthy and prospering Grison 2030.”

9. **Demography meets Europe**
   2012 - the European Year for Active Ageing

   - The European Committee has declared 2012 the European Year for Active Ageing”.
   - Devise a strategy for the implementation of this European year and imagine you would have to present your recommendations to the EU commissioner in charge of this project.
   - Recommended additional literature: web sites of the EU Commission etc.

10. **Demography meets the Office Space**
How should different generations work together productively and longer?

- Describe the evolution of the workforce compositions in Western societies from 1980 – 2040 in a simulation.
- What has changed? What will change?
- What do we know about age-related skills, work styles and productivity and how can they be maximized to the benefit of both the individual and the corporation?
- Leadership and generation management: What are the new prerequisites?

11. **Demography meets Business**
Micro Outlook until 2040

- Create a scenario of the global society by 2040 and by region.
- Conduct an extensive analysis of the impact of these dynamics on business while considering the following drivers:

    - Demographics and commodities
    - Demographics and aging
    - Demographics and innovation
    - Demographics and health
    - Demographics and tourism
    - Demographics and environment

To summarize, this book provides the views of future leaders in business & societies on the questions listed above – except topics 2, 6 and 11. Except of the topic “Demography meets Food Security”, themes related to the developing and emerging countries are definitely underserved. However, the lecturer assures already today that the burning and growing issues concerning these regions will be a main focus of the 2012 class.

Since each paper has a focused executive summary, an easy knowledge gain is also possible for those readers with time constraints.

Both the class lecturer and the students are more than happy to answer any questions which might arise when reading these papers. Our contact details are listed at the end of this course document.

St. Gallen, February 2012

Dr. med. Hans Groth, MBA

Course Lecture

Demography meets Food Security

How to solve the apparently insoluble - Sustainable food security for a population of 10 billion without recourse to Thomas Malthus

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Megatrend 'Global Demographic Change': Tackling
Business and Society Challenges in 2030 and Beyond
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Executive Summary

Food Security and the ever-growing population are two aspects which are very closely related. When all individuals have physical and economic access to food, such a state can be defined as *food security*. The aim of this paper is to expose the idea of food security, to discuss its implications on growing population and to develop strategies in order to cope with the world's future, which is in some way clashing with its capabilities to feed its population. Obviously, food production becomes an issue as humankind is forced to yield a bigger output on the same amount of land without using more water in order to feed an increasing earth population.

We show that the concept of food security is threefold. Its pillars are namely food availability, accessibility, and utilisation. Food availability and accessibility are reasons why there are people starving even though there is currently enough food being produced. Moreover, food security refers to nutritional aspects with obesity being a growing concern. Therefore, mankind is in need of new forms of production, distribution and food awareness to avoid a Malthusian catastrophe, especially when the UN forecasts predict the world population to grow.

A combination of urban living and agricultural production could be one sustainable approach to tackle production deficits, environmental shortcomings and demographic shifts. Another methodology, which has the potential to significantly reduce the current uncertainties, is to genetically modify organisms. As there are changing environmental factors of productions, humanity is probably forced to adapt and breed new comestible goods that positively contribute to all aspects of food security.

Whatever solution policy makers around the globe are pursuing, it is important that measures are put in place as the poor will suffer the most. If not, there are strong indications that Thomas Malthus had a point after all.

Contents

List of Illustrations

Introduction

The future of the world is in some way clashing with its capabilities to feed its population, which has recently reached the threshold of seven billion people and still continues to grow. When all individuals have physical and economic access to food, such a state can be defined as *food security*. The question is whether earth will be able to maintain this state in the future as long as the population continues to grow. It might also be the case that the population growth will face food insecurity issues or even famine and, therefore, will have to adjust its growth potential to the world's feeding capacities.

The aim of this paper is to expose the idea of food security, see its implications on growing population and develop strategies to cope with the upcoming issues. The paper begins with an overview of the three pillars, on which the concept of food security is based. These pillars are namely food availability, accessibility, and utilisation. The second chapter provides a short insight into the population growth trends of the past and discusses the most recent UN population forecast. Based on these data, the reader may become familiar with the upcoming food security issues in a form of a feature-based forecast. The third chapter introduces a broad strategy approach on how to cope with those issues on a global scale. Several particularly interesting measures will be discussed in detail.

The final chapter of this writing is dedicated to the Malthusian theory, a nineteenth century attempt to relate the future of food security to demography. The theory by the British demographer Thomas Malthus had a huge scientific resonance over time. Nowadays, it is especially interesting to see if his postulates have so far been true and if the theory has any relevance in the future.

1. Food Security: Definition and the Three Pillars

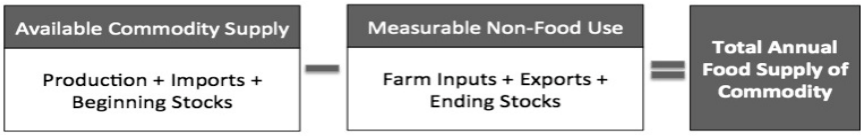
Food security has many definitions. According to one of them (USAID, 1992), food security stands for the following: "When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life" (p. 2). The concept of food security is based on three variables (pillars): availability, accessibility and consumption. Food availability deals with sufficient quantities of food from domestic production, commercial imports or donors; food accessibility with adequate incomes or other resources to purchase foods; food consumption is concerned with the proper use, adequate nutrition techniques and health services (pp. 3-4).

The next sections of this paper will discuss each of these three pillars in detail.

1.1 Food Availability

According to the U.S. Department of Agriculture (USDA, 2011) food availability is a measure of basic food commodities at the farm level or an early stage of processing. The total annual available supply equals to the difference between available commodity supplies and non-food use, as shown in Figure below (Figure 1).

Figure 1: Generic Food Supply Formula



Source: USDA (2011).

According to statistical data of the Food and Agriculture Organization of the United Nations (FAO, 2002), cereals have always been a major source of food for the world population, both used for direct human consumption and as input to livestock production. Countries such as China, the United States (U.S.), India, Russia, Indonesia, Brazil, France and Canada have been the leading cereal producers so far. Today, these eight countries account for 59% of the world cereals output (p. 32).

Since 1980, the world cereal production has grown by more than 60%.[2] Such increases in crop production occur due to the following reasons: expansion of arable land increases in harvest frequency and improvements in yield (FAO, 2002, p. 38).[3] North America's harvesting productivity has been growing faster in the past years in comparison to the other regions.[4] Its yields three decades ago were more than twice as high as Africa's yields are today. North American producers are also playing a crucial role in

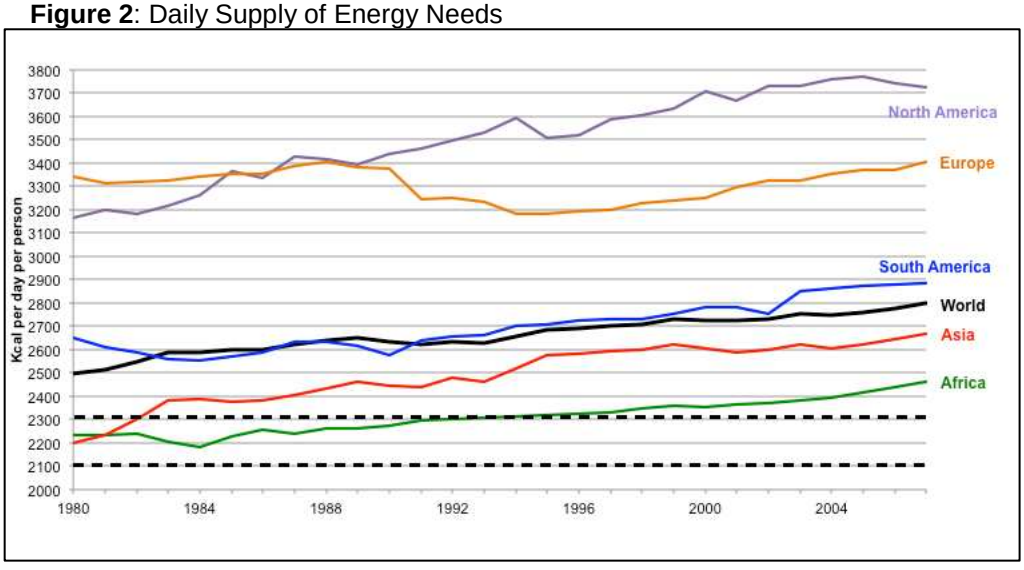
[2] See Figure A1 in the Appendix.
[3] Yield is "the amount of a crop that was harvested per unit of land area" (Investopedia, 2011).
[4] See Table A2 and Figure A2 in the Appendix.

the world cereals trade – they account for about 30% of the world's exports. Surprisingly, two major cereals producers, China and India, have only a 3% contribution to the world's cereals exports (FAO, 2011a; FAO, 2011b).

Livestock accounts for about 40% of the world agricultural production in terms of gross value and provides world population with meat and dairy products (FAO, 2002, p. 58). Today, China, the United States, and Brazil account for 50% of meat production in the world.[5] Production of meat in Asia has more than tripled over the past three decades. The share of Asian meat producers in world output increased from 20.9% in 1980 to 41.3% in 2009 (FAO, 2011a).

Is the world actually supplying sufficient amount of food to its growing population? In order to answer this question, the idea of *sufficient amount of food* should be defined. In *The Atlas of World Hunger*, Bassett and Winter-Nelson (2010) use a calorie-based approach to calculate the basic amount of food required for healthy living. The widely accepted daily recommended nutrition equals 2,100 kcal (pp. 15-18). As stated in the UN publication *Food and Nutritional Needs in Emergencies* (UNHCR et al., 2002), "three agencies have adopted 2,100 kcal as their initial planning figure for calculating energy requirements".[6] At the same time, 2,100 kcal is supposed to maintain the nutritional status of a human engaged in light work (pp. 7-8). Hence, some researchers set daily energy needs at the level of 2,300 kcal (Basset and Winter-Nelson, 2010, p. 18).

Figure 2: Daily Supply of Energy Needs



Note. Central America and Oceania are not included.
Source: Statistical data from FAO (2011a).

In terms of annual production, the Asian region was able to surpass the threshold of

[5] See Table A3 in the Appendix.

[6] The three agencies are the United Nations High Commissioner for Refugees (UNHCR), United Nations World Food Programme (WFP) and United Nations International Children's Emergency Fund (UNICEF).

2,300 kcal in the 1980s, Africa in the 1990s (Figure 2). On a global scale it means that the world population is supplied with enough food. At the same time, having looked more specifically at 145 different countries, FAO concluded that populations of 19 countries suffer from inadequate food supply (Table 1). Moreover, if the energy threshold rises from 2,100 to 2,300 kcal the number of countries with scarce food supply will double.[7]

Table 1: Food Availability Adequacy Estimates Based on Minimum Daily Energy Needs

Food Availability	2,300 kcal./day	2,100 kcal./day
	No. of Countries	No. of Countries
Grossly inadequate (0% – 89%)	14	5
Inadequate (90% – 99%)	26	14
Barely adequate (100% – 109%)	16	21
Adequate (110% – 125%)	31	23
Abundant (125% – 165%)	58	82
Total	145	145

Source: Bassett and Winter-Nelson (2010, p. 17).

The future of food availability still depends on several major producers and exporters of cereals and meat, although the importance of a few has been diminishing over time. Data show that several countries still suffer from inadequate food supply, even though the world food supply seems to be enough to satisfy daily caloric needs of each individual, and most of the countries produce or import a sufficient amount of food.

Food availability provides a starting point for analysing food security issues at a national scale. However, food availability alone cannot tell anything about the access to food and consumption patterns at the household level. In reality, some countries such as Brazil have abundant food supply, but still suffer from undernourishment as a result of unequal food distribution (Basset & Winter-Nelson, 2010, p. 16). In order to explain deeper reasons of food security problems, the concept of food accessibility will be explored in the next section.

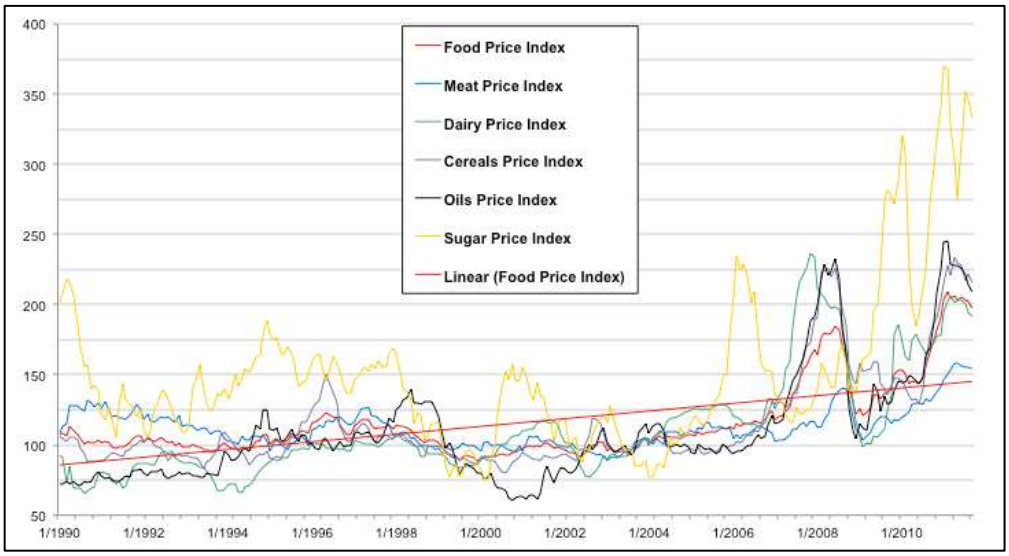
1.2 Food Accessibility

An important factor of food accessibility for a large number of people is the price. The rising prices for agricultural commodities contributed to an increase in hunger worldwide. In 2006 and 2007, prices rose sharply and continued to do so in 2008. Even though a stabilisation can be seen today, prices remain above the pre-2004 level. By mid-2008, real food prices were 64% above the levels of 2002. Such an increase has not occurred since the international oil crises in the early 1970s (FAO, 2008, p. 9). In general, the food price index has increased since the end of the 1980s (Figure 3). With

[7] Figure A3 in the Appendix illustrates how unequally food supply per individual is distributed throughout the world.

the exception of sugar, the price development of goods such as meat, dairy and cereals is more or less in line with the oil price over the years and are today significantly higher than two decades ago.

Figure 3: Real Food Price Indices



Note. The year 2002 is taken as a basis
Source: Statistical data from FAO (2011c).

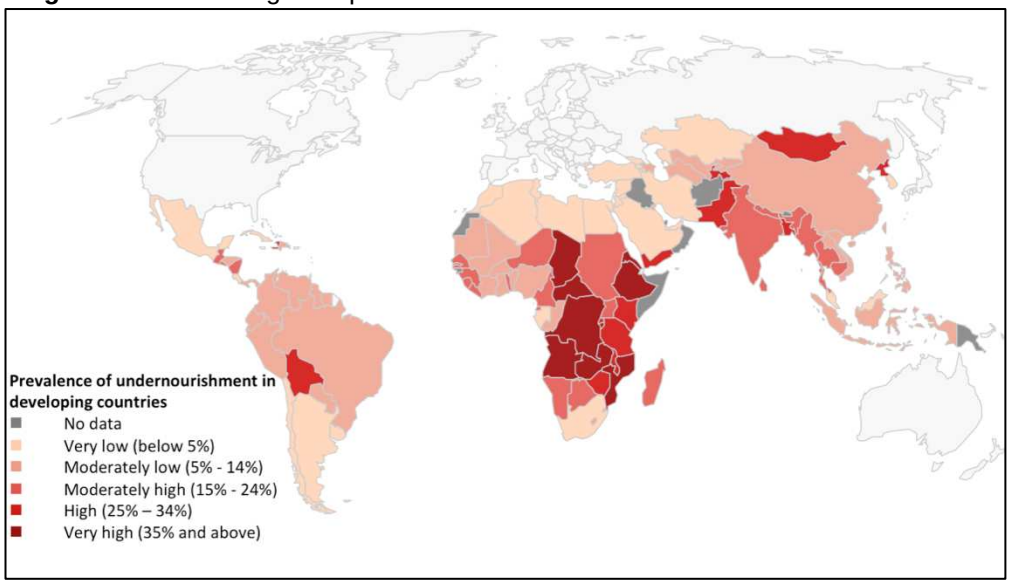
The underlying reasons for this rise in prices can be divided into two groups: Supply-side and demand-side forces. The following aspects belong to the first category. Firstly, the world's major cereal producers such as China, the EU, the U.S. and India changed their agricultural policies. As a result, cereal stocks declined compared to previous decades, which in turn led to a bigger volatility in prices as uncertainties about the sufficiency in times of production shortfalls prevail. In addition, production deficits due to unfavourable weather conditions including droughts and floods contributed as well to the increasing value of agricultural commodities. A third and important influence is the price of petroleum as they are strongly correlated. Especially higher costs for transport and fertilizers as the main drivers resulted from the stronger oil price (FAO, 2008, pp. 9-10).

The first important factor of the demand-side forces is the biofuel demand. The increasing need for commodities such as maize, sugar and palm oil caused a surge in their prices for the developing countries. Government policies to support the biofuel industry as well as the oil price further contributed to higher food prices. Another significant reason on the demand-side are the changing consumption patterns. Furthermore, increased urbanisation and rapid economic growth in countries like China, India and Brazil have led to a boost to purchasing power of millions of people. This new wealth as well as changes in the diet, such as a higher consumption of dairy products and meat, has amplified the demand for cereal (FAO, 2008, pp. 10-11).

Other reasons, such as trade policies and financial markets, have to be taken into consideration as well. The former include export restrictions and speculative re- and pre-stocking, which have deep impacts on the price building. The last-mentioned reasons point to the fact that new type of investments in derivative markets are based on agricultural commodities, which again contribute to the increased volatility of prices.

In general, hunger has been decreasing in the past decades with the vast number of undernourished people still concentrated in the Asian and African regions.[8] Hunger is a dimension of extreme poverty because "not every poor person is hungry, but almost all hungry people are poor" (The Hunger Project, 2008). As of 2009, the World Bank (2008) estimated that there were 1.4 billion poor people who lived on $1.25 a day or less, compared to the FAO (2009) approximation of 1.02 billion undernourished people worldwide. Poverty reduction has been concentrated in Asia, whereas in Sub-Saharan Africa, the number of extremely poor people has even increased.

Figure 4: World Hunger Map



Source: FAO (2010b).

The World Hunger Map (Figure 4) shows the occurrence of undernourishment in the total population of developing countries as of 2010. Similar to food supply adequacy, severe undernourishment exists when caloric intake is below the minimum daily energy requirement (with some taking 1,800, 2,100 or even 2,300 kcal taken as a minimum (see chapter 1.1)). The map shows that the world is grouped in a north-south difference. Especially, countries in sub-Saharan Central Africa suffer heavily from undernourishment. In fact, the whole continent Africa faces a huge challenge regarding food security. Moreover, problems occur in the Middle-East and in central Asia as well as Central and South America. Typically, the Western countries of Europe, North-America,

[8] See Table A4 in the Appendix.

Australia and New Zealand as well as Russia do not have any troubles with undernourishment according to this map.

Looking to the future, higher prices for food will probably persist. Not considering short-factors, the main drivers like the further raising purchasing power, strong biofuel demand and high petroleum prices seem to last and therefore may prevent the prices for agricultural commodities to fall in the next decade. On the other hand, high food prices can present incentives for bigger investments in the agricultural sector, which in the long term can improve the food security. In addition, volatile food prices are also likely to continue due to the stronger connections between energy and agricultural markets as well as a possible increase in the frequency of weather shocks (FAO, 2011d, p. 2).

1.3 Food Utilisation and Nutrition

The third pillar of the food security framework is based on the term *food utilisation*, which refers to how well individuals utilise the food that they can access. However, this definition has to be reviewed in more detail in order to thoroughly tackle food security as a complex sustainable development issue. In the broader sense, food utilisation describes the circumstance of how well individuals utilise the available food that they can access. In literature this has often been discussed and assessed in reference to dietary quality, proper food processing and storage practices as well as to the establishment of non-food resources such as childcare, health care and appropriate health and sanitation facilities.

In recent years, special attention has been spent to the phenomenon of obesity as a form of malnutrition[9]. Not only the American society, but also China and India are following the trend of other developing countries that are steadily becoming more and more obese.[10][11] In 2006, the MSNBC (2006) reported that there are an estimated 800 million people suffering from hunger, whereas on the other hand more than a billion is considered overweight worldwide. In China and India nearly 20% of their respective population size is overweight or obese and the problem is getting worse for children, especially boys (MSNBC, 2006). Comparatively, the U.S. exhibits one of the highest quotas of obesity worldwide, with more than 60% of American adults being overweight or obese (MSNBC, 2006; Sinha, 2010). The issue of food security therefore not only addresses those who either lack “sufficient quantities of food available at a constant basis” (FAO, 2005) or are not “having sufficient resources to obtain appropriate foods

[9] See Coles (2005), Albritton (2010), Prewitt (2004).

[10] See for example Duffey, Gordon-Larsen, Jacobs, Williams, & Popkin (2007), Nelson, Gordon-Larsen, North, & Adair (2006), Nielsen & Popkin (2003), Pereira et al. (2005), Rodriguez & Moreno (2006).

[11] Definitions of obesity and overweight are not arbitrary, but are based on the internationally accepted standards (WHO, 2000, p. 6).

for a nutritious diet" (FAO, 2005), or both, but continuously draws its attention to the misuse of available and accessible food.

Thus, in the narrower sense, the third pillar of food security refers to the people's and household's food behaviour as well as their allocative understanding and consumption patterns. For developed countries the main concern is to choose the right kind of food. Fast food and other sort of "inferior" comestibles, which generally are low in cost and nutrient value, exhibit a large amount of calories and usually are heavily promoted. As mentioned in the previous section, patterns of food consumption are becoming more similar throughout the world due to the world's exposure to North American and European dietary habits and increased international trade in foods. Changes in diet also reflect the growing incomes and affect the global demand for agricultural output, encompassing such expensive foods as meat and dairy products (FAO, 2002, p. 19). A good accessibility and the increasing affordability of this kind of food combined with gradually urbanised, automated and more sedentary lifestyles can lead to disadvantageous eating habits (Gardner & Halweil, 2000).

However, overeating is growing in poorer and less developed countries as well, even where hunger and poverty remain persistently high. In Colombia, for example, more than 40% of adults are overweight, a number that rivals those observed in Europe. In China, consumption of high-fat foods has risen while the food diet with rice and other originally consumed goods has fallen (Gardner & Halweil, 2000). According to a survey commissioned by the World Health Organisation, China was expected to lose $558 billion "in foregone national income due to heart disease, stroke and diabetes alone" between 2006 and 2015 (WHO, 2011a). Furthermore, both hunger and obesity might lead to a reduction of a person's physical fitness, to an increase in the susceptibility to maladies and shortening of life expectancy (Gardner & Halweil, 2000). Additionally, children lacking vital nutrients during growth can suffer from constantly reduced mental capacity and disturbances of growth (Bassett & Winter-Nelson, 2010, p. 37). From a national perspective, hunger and obesity have a negative impact on educational completion and on economic productivity, while hampering the liability of health care and generally reducing a society's well-being.

Hence, the epidemic of poor eating has equally become a substantial handicap to development in rich and poor countries alike. The origins for the malnutrition, however, are numerous. Major causes of malnutrition include poverty and food prices, agricultural productivity, climate change and dietary practices. The latter is closely related to the above mentioned consumption behaviour and cultural idiosyncrasies. In China and in many other countries the obesity epidemic for example might be rooted in lax social attitudes towards chubby body shapes and body fat. According to Yangfeng Wu of the

Chinese Academy of Medical Sciences in Beijing, “in Chinese culture, there is still a widespread belief that excess body fat represents health and prosperity” (*MSNBC*, 2006). Furthermore, the Chinese vice health minister states that “the Chinese population does not have enough awareness and lacks knowledge of what is reasonable nutrition and diet” (*BBC News*, 2004). Combined with the prevalence of advertising for calorie-dense low-nutrient foods as a significant contributor to the obesity, people often are not able to make reasonable consumption choices.

Having food to eat, whether the food was purchased at the store or grown at home, is not the end of food security. In order to face the problem with obesity some challenges have to be met.[12] Firstly, there has to be a guarantee that for consumers the healthy choice is the easy choice. Thus, food labelling, which, in theory, is meant to make choosing healthy alternatives easier, has to be consistently implemented. Secondly, consumer trust in food has to be taken serious. In order to meet this challenge the understanding of consumer behaviour must be enhanced. Thirdly, it must be ensured that food products comply with consumer demands for nutrition and health. Moreover, a healthy diet ought to be provided. Consequently, it is essential to develop new and successful food-based strategies to improve people’s health and to reduce the risk of diet-related diseases.

To conclude, the three pillars help examine all components of food security, such as supply, demand, and consumer behaviour. Over the last decades, the world has been able to produce more food than required to fulfil daily energy needs of each individual. Nonetheless, in particular countries, food supply is still inadequate and, therefore, serves as a main reason for undernourishment. In those regions where enough food is supplied, the reason for unequal food distribution lies in poverty. The issue of hunger primarily affects few particular regions like Asia, sub-Saharan Africa, and Latin America. The magnitude of undernourishment has been decreasing in both percentage and absolute terms. However, there is another nutrition problem, which is now becoming an important problem of the century – obesity.

2. Population Growth Meets Food Security

As we have seen in the previous chapter, food security can be seen as three-dimensional concept. In the next step, this concept will be merged with the demographic development in the next 20 years. To begin with, the population forecast until 2030 according to the United Nations will be analysed. Subsequently, the most pressing food

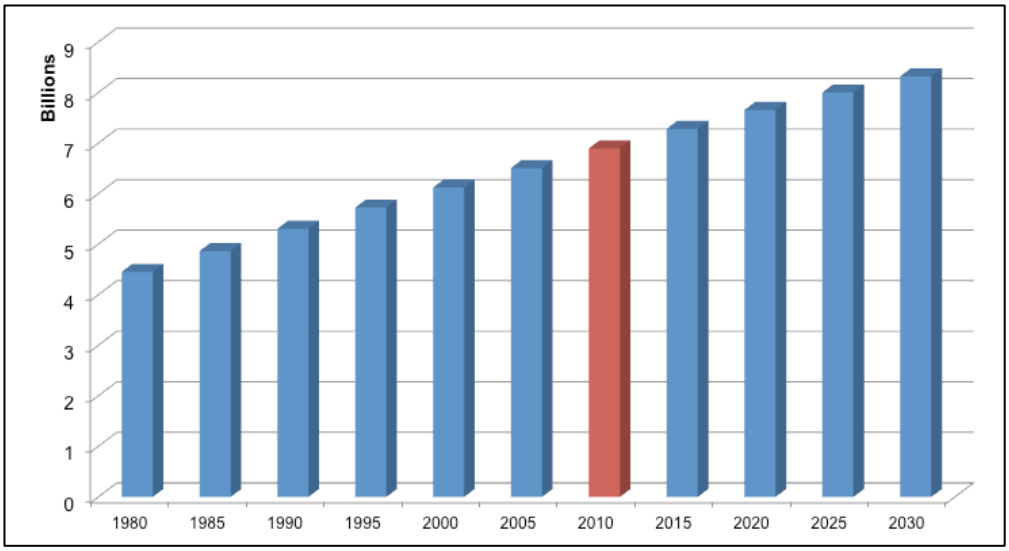
[12] Of course, for the more than 800’000 people starving first access to and availability of food must be ensured.

security issues will be examined. Finally, a food security forecast shall identify where it is necessary to find strategies in order to solve the problem.

2.1 The UN Population Forecast

At the end of the twentieth century, world population has passed 6 billion and has hit the 7 billion mark very recently on the 31st of October 2011, according to United Nations Population Fund (UNFPA, 2011). Between 1987 and 1999, the addition of a billion people took place over a 12-year period. It is expected that the 8th billion will come about in 13 years. According to the population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (UN, 2011), the population of the world is likely to rise by 1.4 billion during the next 20 years, from 6.9 billion today to 8.3 billion in 2030 (Figure 5). Since 1980 until today the growth accounted for 2.4 billion human beings. This increase in world population will take place mainly in the less developed regions of the world, particularly in fragile countries in terms of politics, economy and environment. That projection is based on declining fertility rates, if they do not fall as anticipated, figures might be even higher. Especially the countries with the least development are most likely to have the biggest population growth with further impacts on their ability to tackle these already huge challenges. In the more developed regions however, the change is expected to be far less dramatic in terms of population figures. Currently, there are slightly more than 1.2 billion persons living in Western countries. Nevertheless, demographic changes will occur too, as fertility rates will continue to decline under the replacement levels. Moreover, shrinking working-age populations and increasing numbers of retirees will further challenge the Western countries (UN, 2005).
The most dramatic changes however, will occur on national level. Six countries account for nearly half of the current annual population growth of about 76 million: India (22%), China (11%), and Pakistan, Nigeria, the United States of America and Bangladesh (about 4%). As a result, India will overtake China as the most populated country in the world by 2030. Africa is the fastest growing continent. The current population of Sub-Saharan Africa is today little more than Europe and a fifth of Asia's (*Economist*, 2011).

Figure 5: The World Population between 1980 and 2030



Source: Statistical data from the UN (2010)

2.2 Food Security Forecast

After the world food situation has never appeared better for a long time, the world is now entering a new food era. Not only will it be characterised by rising food prices and rapidly growing numbers of people starving, as discussed above, but as well by an intensifying conflict about land and water resources across national borders. As a result of persistently high food prices and the swelling phenomena of hunger and obesity, the early signs of a worsening food situation cannot be ignored. As time is passing by and the world's population has currently reached the size of 7 billion, food seems to be the weak part in today's global society, as it has been a couple of times in the history of mankind. However, this time the causes, circumstances and solutions are manifold and, therefore, posing probably the biggest challenge which humanity has to face at the moment.

When providing a subjective and rather qualitative food security forecast, as it is done in this paper, it is worth picking up some main conclusions of the three pillar framework from the first part of this paper. First, current food production technologies and schemes are considered to successfully face today's world demand. However, world's future food supply could fall short of world food demand, if the on-going environmental trends make it difficult to expand food production fast enough. Second, even if all food producers on earth are and will be able to provide every single individual with a sufficient amount of daily nutrients, there still might be hundreds of millions people starving. Be it persistently high food prices, driven by a continuously increasing purchasing power, biofuel demand and petroleum prices, or deficient logistic accesses,

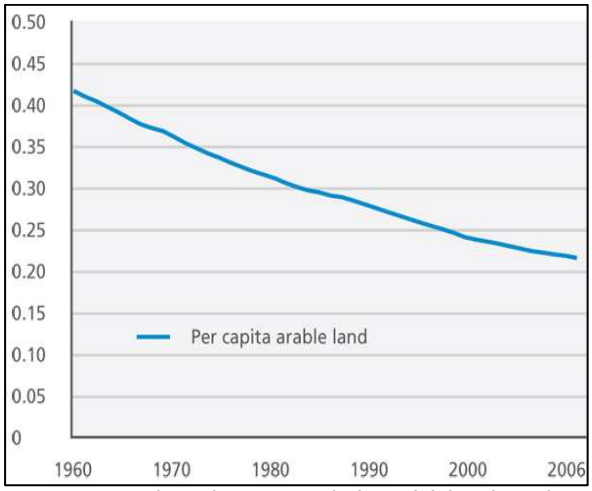
there will be people dying from not receiving *their share* of food available. Third, there are as many people starving as there are people being obese. If the future consumption behaviour of those being able to access food does not change, this ratio is likely to change, having a negative impact on the attention earlier devoted to hungry persons. This scenario might then lead to a distortion of the public eye and thus a drop in development aid.

Having stated these key findings, some of them need to be considered more carefully in order to better understand how the future food security could evolve. With a special regard to the development of food production, as well as its drivers and its implications, trends and threats of food security issues are further being discussed.

2.2.1 Food Availability

Every single year there are nearly 80 million people being added to the world's dinner table, the number expected to rise over the coming years (Burman, 2011). Driven by three current and future trends from the demand side, population growth, rising consumption of grain-based animal protein and, most recently, increasing use of grains for the production of bio fuel (Brown, 2009, p. 29; Love, 2010), governments and the food industry have to step up in order to meet the problem of falling per capita food production. However, on the supply side environmental developments could make it increasingly hard to expand food manufacture possibilities, as stated above. Phenomena like soil erosion, groundwater depletion, crop yield shrinking heat waves, glacier meltdown, and rising sea levels could occur more frequently. Apart from that, three resource trends are expected to have further negative effects on future's food supply: the loss of biodiversity (e.g. by desertification), the diversion of irrigation water to metropolises and the exhaustion of oil resources (Brown, 2009, p. 29).

Figure 6: Development of per Capita Availability of Arable Land between 1961 and 2006

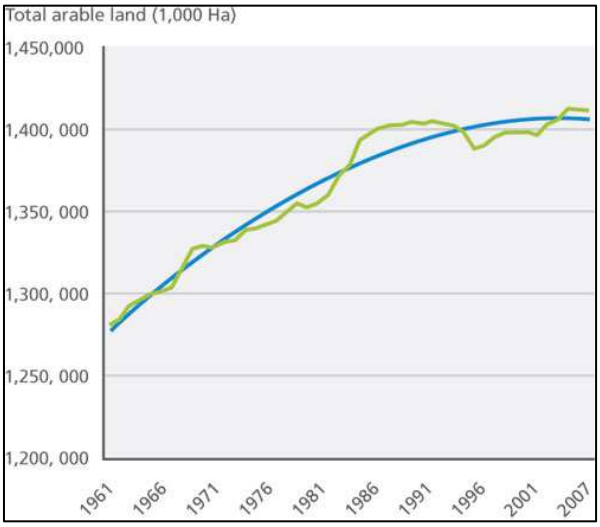


Source: FAO (2009); UN Population Division (2006)

In the past years soil erosion and desertification have led to a drastic decline of productivity of some 30% of the world's cropland. Some countries even had to face declines of outputs by half or more over the last three decades. In north western China, overgrazing, over ploughing and deforestation resulted in the partial or complete abandonment of more than 24,000 villages and their surrounding croplands (Brown, 2011). The problem is and will be that without any further measures, incentives and/or policy changes

the loss of topsoil is expanding and, thus, virtually impossible to reverse. Recent developments support this view. Arable land expansion has slowed down significantly in the last five decades, which implies that the largest parts of best arable land are already in use (Figure 6). This, together with a substantial demand increase for food due to a daily population growth of 200,000 people, led to a reduction of the per capita amount of arable land by 50%. In order to feed the new arrivals at the world's food table, every single day an additional acreage of cropland the size of Greater London, or twice the size of Singapore, is needed.

Figure 7: Development of the Total Global Arable Farmland Area between 1961 and 2007



Source: FAO (2009); UN Population Division (2006)

Since this is neither happening at the moment, nor expected to happen in the future, the amount of farmland per person declines and most probably will continue to decline (Figure 7). Furthermore, most of the usable land has already been cultivated. According to the FAO the Near East and North Africa will be using 94% of its suitable cropland, South Asia 98% (2002). As Figure A4 depicts,[13] large parts of the remaining land are either deserts (too hot for agricultural activities), ice (too cold for agricultural activities) or forestlands, which shall not further be diminished. Moreover, due to the reduction of production gains from the Green Revolution and the fact that it is becoming harder to increase global food production by the use of conventional means the food production is increasing significantly slower than the world population. However, cropland is also being lost to the rising phenomenon of urbanisation. For the first time in human history half of the world's population, or about 3.3 billion people, live in urban areas (Dugger, 2007). By 2030, this number is expected to rise to 5 billion people (UNFPA, 2007). Consequently, according to the FAO the size built-on areas will enlarge by 75% by 2030. Further, if all of the expected expansion of cities were to take place on farmland, an area as big as France would be lost to urbanisation by 2030. Nevertheless, rising productivity growth could reduce the amount of land needed to produce a given amount of food by around 56% (FAO, 2002, p. 41).

Whereas the loss of topsoil started with the extensive cultivation of wheat and barley, the phenomenon of falling water tables is a quite recent one, simply because of the

[13] See Figure A4 in the Appendix.

fact that high capacity pumping stations to deplete aquifers have only recently been developed. In countries like India and China, which all extensively use high capacity pumping stations, an estimated 400 million people are being fed by over pumping, "a process that is by definition short term" (Brown, 2010, p. 30). Saudi Arabia currently faces the problem that its major aquifer, a non-replenishable fossil aquifer, is going to be depleted by 2016, making Saudi Arabia entirely relying on imports for wheat.[14] However, the scarce resource of water is already facing high and unsustainable demand from all sorts of users. Since cities increasingly channel water from the surrounding areas, farmers find themselves in an unequal competition for the acquisition and use of water.[15] Reports show that if current water policies continue, food producers will find it very difficult to meet the world's future food needs (Rosegrant, Cai & Cline, 2002, p. V). As usual, the poorest people are expected to be those hit the hardest. But even countries regarded as relatively better off in terms of water availability, e.g. Brazil, Russia, China and India, suffer from water shortages. And since water demand will likely grow by 70% until the end of 2030, water scarcity could by then be one of the biggest problems humanity has ever faced. In this context, it is crucial to understand that future food security, people's livelihoods, industrial growth and environmental sustainability are heavily influenced and driven by the current and future water development. Human needs are considered to grow with increasing population, be it for direct consumption or for secondary usages such as energy production, agricultural, commercial and industrial activities. The sustainability of water resources is adversely connected to these increasing demands. If then over the coming decades climate change is going to happen as expected,[16] water will be under severe stress.

However, the future of food production and water is highly uncertain. Some of this uncertainty is due to uncontrollable factors such as weather conditions. But other factors can have considerable effects of future food and water security, too. These factors are influenced by people's needs and choices and generally encompass factors like income and population growth, investments in technologies, allocation of (scarce) resources to various uses and policy changes. Therefore, policy decisions and the actions taken by millions of individuals determine the future drivers of long-term food supply and demand. In the literature, various scenarios are being discussed that show the different outcomes that policy changes produce.[17] Since all or none of them may actually happen and, therefore, be right or wrong, we rather state the following two things:

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[14] Saudi Arabia produces 2.5 million tons a year of wheat, enough to meet national demand.

[15] In California thousands of farmers find it more profitable to sell their irrigation water to Los Angeles and San Diego rather than using it for farming activities. China as well is channelling a lot of irrigation water from rural to urban areas.

[16] See Gleick, 1989; Hurd et al., 1999; Jacobs et al., 2001; Bates et al., 2008; Brekke et al., 2009.

[17] See Rosegrant, Cai & Cline, 2002; Rosegrant, Agcaoili-Sombilla & Perez, 1995.

First, future food availability will be shaped by further conversion of farmland to urban uses, by land degradation and by other factors such as productivity growth and climate change. Second, future food security will further be jeopardised unless policy makers, industries and individuals collectively team up to slow population growth down, mitigate climate change, protect aquifers, conserve soils and maintain farmlands. Thus, from the production perspective the question is: Will the world food output expand fast enough to keep track with the gradually growing demand? Chapter 3 addresses this question by discussing measures that could increase food production output in the future.

2.2.2 Food Accessibility

At risk are more than 800 million food-insecure people, most of them living in rural areas and dependent to some extent on agriculture for their income.[18] At risk are a further 2-2.5 billion people meeting their daily needs with an income of USD one to two per day. These people therefore heavily depend on two things: First, on the price level of food and, second, on the price level of commodities and land. If only one of these two prices rises, 3 billion people could be pulled to an even more food-insecure state. Therefore, the question is: Will all people, at all times, have physical and economic access to food? In response, as world food security is deteriorating, some countries start to ban or limit grain exports. Other countries lock up future grain supplies by nailing down long-term bilateral trade agreements. However, the potential and the large global expansion of biofuel production allure individual countries, industries and farmers, which very often are acting in their narrowly defined self-interest. By using more and more farmland or crops for the production of biofuels rather than for the supply of food, the access to food is going to be hampered, unless governments set out to implement according policies and action plans. Still, the so-called “food vs. fuel” debate appears to have been exaggerated in many cases. The topic is far more complex than it has usually been presented since agricultural and export policy and the politics of food availability and accessibility are issues of far greater significance.

Determining future food accessibility itself is rather complex. Since accessibility of food heavily depends on food and food resource prices, its future is directly connected with the development of the production of food, its allocation and the access to agricultural commodities. However, food availability does not guarantee food accessibility. Government policies must foster the equal distribution of food within nations, regions and communes. Moreover, for food to be accessible, individuals and families have to be able to afford the food prices on the market. But when looking to the future, it is like-

[18] People with a daily income of less than USD 1 spend most of it for food (Banerjee & Duflo, 2007).

ly that high prices for food will persist, making it for many people difficult to obtain nutrients in sufficient amounts, if at all. We therefore state, that as long as in developing countries poverty, wars and civil conflicts, corruption and national policies that do not promote equal access to food for all persist, food security will not become reality.

2.2.3 Food Utilisation

As discussed in chapter 1, there are several factors that influence food utilisation. There are eating patterns and habits (nutritional taboos and traditional beliefs vs. convenience), understanding of nutrition (level of education, nutritional knowledge), quantity and quality of food eaten (number of meals per day, diet balance and food safety) and access to clean water. According to several reports today's and future's prevalent problem are eating patterns and habits, which cause to phenomenon of obesity,[19] occurring not only in developed but in less developed countries, too. Forecasts suggest that every country in the developed world will most likely see rising rates of obesity and overweight people over the next ten years. Even though levels of obesity vary widely from country to country, an OECD working paper expects the rate of increase to slope up at roughly the same incline in different countries (Sassi et al., 2009). This will finally affect future population health and economics. Interestingly, healthcare cost curves basically mirror the curves of obesity development, therefore leading to the conclusion that deficient food utilisation causing obesity does have negative effects on the healthcare expenses.

However, it is worth noting that this trend is particularly marked among lower income groups, suggesting that richer countries are more able to educate people with regard to food consumption and nutrition needs (Babey, Hastert Wolstein & Diamant, 2010). This would imply that poorer countries will have to deal with even more increasing obesity rates, and, on the back of that, will be experiencing ever higher burdens of ill health and healthcare costs. Consequently, factors predominantly related to the diet and lifestyles of those with low incomes are putting them at particular risk of obesity. How to address this will be discussed in chapter 3.

3. Strategies to Cope with Food Security Issues

According to the forecast, the future of food security is not going to be *trouble-free*. For that reason, a global food and nutrition strategy should be established in order to solve the issues of the present and mitigate possible risks in the future. In this paper, we would like to discuss our strategic approach to the food security problem.

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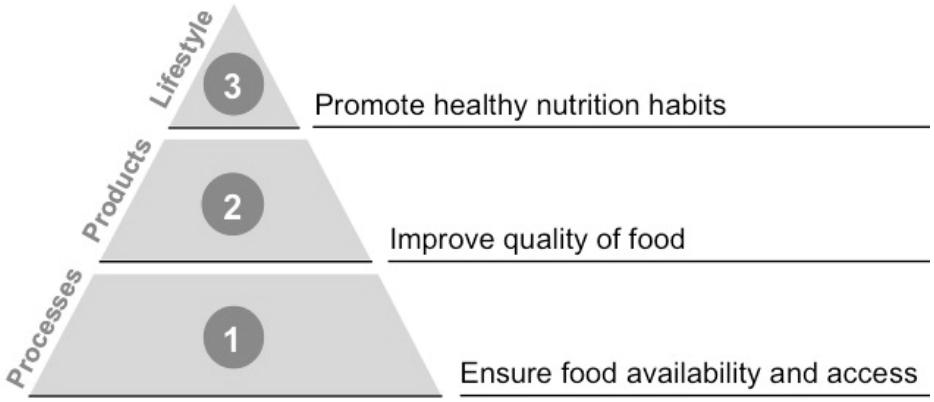
[19] See Drewnowski & Darmon (2005), Dehghan, Akthar-Danesh & Merchant (2005), de Onis & Blössner (2000).

The food security strategy is supposed to cover three generic levels: processes, products, and lifestyle. The idea of the pyramid means that each upper level cannot exist if the lower one has not been fulfilled. As shown in Figure 8, three levels are parallel to the three strategic goals.

Figure 8: Food Security Strategy Pyramid



The future of food security relies on sustainable food production and distribution throughout the world. Therefore, processes lie in the basis of the pyramid. Obviously, product quality upgrades, if they are not reachable by the people, do not bring any value added. Consequently, the product component constitutes the second level of the pyramid. Finally, the third level is given to the healthy lifestyle, which has to be promoted among the population as long as the latter has unrestricted access to high-quality foods.

According to the Business and Industry Advisory Committee to the OECD (BIAC, 2009), the future of food security first of all relies on productivity increases since the world's natural resources are limited. As a result, innovative technologies for both products and processes are increasingly important to meet the growing demands of demographic developments (p. 2). Thus, our strategy seems to be closely related to the ideas of product and process innovation. *Product innovation* means "introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses" (OECD, p. 48) whereas *process innovation* is the "implementation of a new or significantly improved production or delivery method" (p. 49). In other words, process innovation relates to the improved farming techniques while product innovation relates to new crop varieties derived through conventional hybrid as well as biotech breeding techniques (BIAC, 2009, p. 2).

Of course, the food security problem is of a complex nature – in reality, various strategic measures can affect two adjacent levels of the strategy pyramid and help achieve more than one goal. The final pages of this paper outline the most extraordinary measures in the areas of product and process innovation and slightly touch the ques-

tion of a healthy lifestyle.

3.1 Improve Food Availability and Access

Population growth and threatened food security demand new forms of organising food production and food allocation. One way to address this challenge is by asking where the vast majority of food is being consumed and allocated. Only a century ago, the predominant majority of the world's population lived in rural territories, characterised by small-scale housing estates, exiguous socio-economic systems and agricultural production activities. Now, after one hundred years of extensive rural-urban migration, the unstoppable surge in urban growth is no longer caused by (rural) migration, but by natural increase (demographic shifts) instead (UNFPA, 2007). In fact, urbanites will outnumber peasants within less than ten years, leading to a situation where cities become mega-cities and where these cities demand the highest amounts of food and water.

However, the patterns and dynamics that today's urbanisation processes have achieved – expanding their size at the expense of cropland and diverting irrigation water away from farmland and into the city – will not only be crucial to the long-run sustainability and habitability of Earth, but to the survivability of millions of people, too. Therefore, the next decades will show whether humanity will be able to cope with and even make use of the process of urbanisation, or whether, alternatively, will have to face risen poverty, water shortages, loss of biodiversity, hazardous waste, smog, ozone depletion and desertification caused by urban development.

Hence, it is not surprising that today's food security considerations, carried out by governments all around the world, very much take into account urban planning processes and developments. In fact, cities are at the forefront of our most pressing food security challenges which require governments, public and private organisations as well as individuals to take a fresh perspective at how food can be produced, allocated and consumed in crowded urban areas. The question is how to plan, build and/or adjust a city more sustainable, efficient and self-reliant which does as little harm to the ecological surrounding and to people starving as possible. Therefore, the reassessment of today's situation of cities within the limits of their capability to foster food availability, accessibility and utilisation not only poses a serious challenge, but offers hope and confidence for achieving food security through the possibility to build or transform cities in such a way that less people live under insecure food conditions than before. Key words in this context are urban agriculture, local food and community development. And two of the key measures to achieve all this are food parks and vertical farm-

ing.[20] Moreover, by understanding a city as a system with several sub-systems (e.g. quarters) it becomes clear that analyses and suggestions provided by the concept of food parks and vertical farming base on micro-level observations.

The nourishment of the dwellers cities' sub-systems can be provided by "food parks" as well as by integrated vertical farming, delivering food efficiently, environmentally friendly and independent from weather and climate conditions. In this high-tech agricultural plant, meat, fish, eggs, vegetables and fruits are produced on different floors, which mutually supply each other with fertilizer, forage and energy. The comestibles are leaving the building already packaged and ready for consumption because of the integrated slaughterhouse and industrial packaging factory.

3.1.1 Food Park

The building consists of several stories, which are all interconnected.[21] In the basement, a fish farm is exploiting the slaughterhouse waste, which arises from the pig, cow and chicken butchery situated on the ground floor. The animals are bred on the first floor in a closed airtight space with access to open air terraces. Grasshopper and other insects, which are bred on an intermediate floor, supply protein-rich forage for the pigs and cows and act as biological pesticide. The animals' exhaled air in form of carbon dioxide is collected and used for the growing of plants, vegetables and fruits on the upper stories. The slurry and droppings of the animals can be concentrated and used as an organic fertiliser for the plants as well. Moreover, the lost heat from the animals together with the biogas from organic waste and dung could be used for the heating of the building. In the top floors which are exposed to sunlight, green houses with transparent grounds make sure that the vegetable and fruit plants get as much light as possible. It is important that there is on-site grain production, so that forage imports for the animals are down to a minimum. Moreover, the usage of different types of water (water for cleaning and maintenance, high-quality drinking water) allow the food factory to be integrated in the water cycle of the sub system, which in turn also provides the irrigation of plants. Computer systems monitor the watering and nutrient uptake as well as the ripeness condition, hence minimising losses through spoilage.

3.1.2 Living Towers

The living towers themselves provide another opportunity to grow plants and crops. Harvests could be enlarged through new species of wheat (maybe genetically modified, see chapter 3.2) together with new cultivation techniques such as drip irrigation, aero-

[20] The phrase *vertical farming* was coined by Gilbert Ellis Bailey in 1915 in his book *Vertical Farming*.
[21] See Figure A5 in the Appendix.

ponics and hydroponics. Especially higher floors and the roof tops are more suitable because of the increased allocation of sunlight. Transparent building materials with integrated solar panels play a vital role in the architecture of such towers. In addition, these buildings have a rotatable basement, based on magnetic levitation in order to follow the course of the sun and therefore maximising light and energy production.

3.2 Improve Quality of Food

As we have seen in chapter 2, food availability for an ever-growing population is a huge problem. The current agricultural production could fall short of the demand due to the fact that it is difficult to expand the output of the current arable land. Problems, such as desertification, soil erosion, groundwater deletion and urbanisation, further worsen the chances of keeping up the food production with the population growth. Clearly, opening up more undeveloped land for cultivation to meet production needs is no longer an option. Moreover, the fresh water available per person has decreased fourfold in the past 60 years (UNEP, 2002). Thus, food production must increase on the same amount of arable land while using less water. Because of this challenge, an important goal of the improvement of agricultural crops is to adapt our existing food production to increasing temperatures, less water availability in some areas and flooding in others, rising salinity and changing pathogen and insect threats (Ronald, 2011). Parallel to increasing population numbers and demand for food we have seen in chapter 1 that there is sufficient food, but also an abundance of unhealthy food. Obesity is becoming more and more a problem throughout the world. Applications of genetically modified food could contribute to solve this difficulty as well.

One possible solution to food crises in terms of production, but also food utilisation, could be Genetically Modified Organisms (GMO's). According to the World Health Organization (WHO) these organisms can be defined as "organisms in which the genetic material (DNA) has been altered in a way that does not occur naturally" (WHO, 2011b). The principle is that individual genes can be transferred from one organism into another, also between non-related species. These GM foods are produced due to the fact that there are some perceived advantages for the consumer as well as for the producer. Advantages can generally be lower prices, better nutritional value and benefits in terms of durability (WHO, 2011b).

3.2.1 Insect- and Viral-resistant and Herbicide-tolerant Crops

With the evolvement of genetics a variety of alternatives to the chemical control of insects is available. For instance, cotton and corn have been genetically engineered to produce proteins from a bacterium that kill some key caterpillar and beetle pests of these crops. As research showed, these so-called Bt toxins caused little or no harm to

other non-target organisms including beneficial insects, animals and human beings. With the use of genetically modified plants resistance to a harmful virus can be engineered, harvests saved and diseases kept under control. Similar plants have been invented to fight harmful weeds, the herbicide-tolerant crops. Weeds compete for nutrients and sunlight with crop production and, therefore, are a major limitation. Many of the herbicides used to fight these weeds have been classified as toxic to animals, human beings and groundwater. There are, however, newer herbicides that are considered as non-toxic, but still are very effective. With the help of genetics, crops were modified for tolerance to this rather harmless herbicide. The main benefit was that the usage of more toxic agents was reduced and the production output increased.

Another benefit in terms of sustainable agriculture is that herbicide-tolerant corn and soybeans have helped promote no-till agriculture, which leaves the fertile top-soil intact and protects it from being removed by rain or wind. The effects are that these methods can improve water quality and reduce soil-erosion (Ronald, 2011). The development of genetically engineered crops that are tolerant of environmental stresses is broadly beneficial. Such crops are expected to enhance local food security, for instance drought-tolerant corn could help most African countries increase their harvests. Benefits of genetically modified crops that have been scientifically reviewed according to Ronald include reductions in insecticides, improved soil quality and reduced erosion, enhanced health benefits to farmers and their employees due to reduced exposure to chemicals, economic benefits to local communities and enhanced biodiversity of beneficial insects. Also very important is the fact that they contributed to increased crop yields (up to 30% in some areas) as well as more profits for the farmers. Further promising applications of genetic modifications are those that affect staple food crops. For instance, rice is the basic everyday meal of billions of people as it is grown in 114 countries on six of the seven continents (FAO, 2011e). Thus, modifications that slightly enhance rice production and resistance can have huge impacts on the lives of many.

3.2.2 Nutritional Enhancements

As we have seen before, food utilisation is one of the main challenges on food security. For instance, a public health problem in around 100 countries mainly in Africa and Southeast Asia is vitamin A deficiency (Golden Rice Project, 2011). The WHO estimates that an improved nutrition with vitamin A could prevent the deaths of 1.3-2.5 million late-infancy and pre-school-age children each year (Ronald, 2011). Therefore, scientists tried to fortify rice plants with higher levels of carotenoids, which are precursors to vitamin A. The resulting product was named “Golden Rice”. Results from studies showed that these carotenoids of the Golden Rice can be metabolized into the vit-

amin A that children need (Tang et al., 2009). Consequently, a widespread consumption of Golden Rice could reduce this nutrition deficiency and help to save thousands of lives. The positive effects of Golden Rice are predicted to be most pronounced in the lowest income groups at very low costs (Stein et al., 2006). Other examples of successful examples of nutritional enhancements through genetically modified foods include fortified salt with iodine or bananas with bacterial antigen.

3.2.3 Safety Assessment and Controversy

The examples described above are just small excerpts of the huge potential that lies in GMO's. In this paper, genetically modified animals are not further assessed as their usage is much more controversial and science is not as advanced as with plants. Nevertheless, there are safety issues with GMO's that need to be discussed as well. Every genetic modification carries a risk of unintended consequences. However, according to Roland there is a broad scientific consensus that today's genetically modified crops are safe to eat.

Naturally, there are some drawbacks as the overuse of certain herbicides or plants can always lead to the evolution of resistant insects or weeds. In addition, a lot of knowledge about these new forms of crops needs to be distributed to farmers, companies and governments around the globe, which is a very costly procedure. Moreover, consumer attitudes in several countries, especially in Europe and Japan have been largely negative as there is scepticism about the health and environmental consequences of GMO's. To the contrary of the developed world, the developing countries have a generally more positive perception of genetically modified foods. Reasons may be the more urgent needs in terms of food availability and nutritional content (Curtis et al., 2004). Consequently, this negative attitude towards GMO's has an influence on public policy in the Western Countries and therefore might hinder the spread of GMO's as a solution for the food security problem in connection to the demographic change.

3.3 Promote Healthy Nutrition Habits

Among the poor, there is often not enough food at home, and most institutions in developing countries lack restaurants or cafeterias. At the same time, the most practicable way to fight hunger would be so-called *institutional feeding*, which means providing people with healthy nutritious breakfasts and lunches in various institutions like schools, hospitals and homes for the elderly (WFP, 2011; *Food Security and Nutrition Strategy*, 2008, p. 29). Nutrition education should be integrated into to a daily institutional life in order to promote healthy lifestyle and make people aware of the measures they can take themselves in order to fight malnutrition problems. In addition, strategic partnerships with non-profit organizations are crucial for institutional feeding in develop-

ing countries because such partners can help mitigate funding and implementation issues. Finally, constant health and nutrition check-ups are important as a way to assess and control the outcomes of institutional feeding programs (p. 30).

Institutional feeding is a universal approach because it can be implemented not only in developing low-income regions like sub-Saharan Africa and Asia, where many people are starving from undernourishment, but also in developed countries. For example, there has been a successful U.S. experience, which is called Supplementary Nutrition Assistance Program (SNAP), whose goal is to provide low-income Americans with healthy nutrition so that they do not adhere to inexpensive "junk foods" (USDA, 2010). Operation of such agencies as SNAP on a global scale could help educate people in those regions, where poverty not only causes undernourishment, but also serves as a main reason for obesity.

4. Malthusian Theory

The discussion about food security in the context of a growing population is not exclusively debated today. In his *An Essay on the Principle of Population* (1826), the British scholar Thomas Malthus (1766-1834) already argued that the growing world population was getting *checked* by famine, decease, and resource scarcity.

The scholar believed that if no constraints were set on the population, it would grow at a geometrical ratio. At the same time, he argued that food production in a limited territory "must be of a totally different nature from the ratio of the increase of the population" and (pp. 6-7), therefore, it was only capable of increasing at an arithmetic ratio. According to Wrigley (1986), this idea "was as unobjectionable as the assertion that man must eat to live" since less and less suitable land can be taken in cultivation as population growths (p. 48). By the law of nature, "population can never actually increase beyond the lowest nourishment capable of supporting it" (Malthus, 1826) while the population growth "can only be kept down to the level of means of subsistence by the constant operation of the strong law of necessity" (pp. 3-4, 11). As a result, limited earth resources would soon limit population growth.

4.1 Role and Limitations

Since the time in which Malthus had written his essay, the world population has grown from one to seven billion people. Obviously, Malthus underestimated the role of the technological change in the food production and, consequently, did not foresee the industrial revolution (Wrigley, 1986, p. 63). In agriculture, the invention of fertilizers among other factors contributed to an extension of food production to a level that was in line with population growth. The theory did also not take into account the increase in

the practice of contraception from the later nineteenth century which put a constraint to the human capability to reproduce at a geometrical scale (p. 54). Moreover, Malthus underestimated that there still was a lot of room for expansion of cropland.

In the second half of the last century, there was a reoccurrence of Malthusian pessimism. The Club of Rome published in 1972 the startling book *The Limits to Growth*, which was printed in millions and translated into 20 languages. The main scientific conclusions were portrayed in scenarios that "human economy overshoots planetary limits before the growth of human ecological footprint can be limited" (Club of Rome, 2010, p. 2). In the U.S., a book by the biologist Paul R. Ehrlich called "The Population Bomb", published in 1968, had a similar pessimist view as the Club of Rome. The main message of the neo-Malthusian book was that there might be mass starvation due to overpopulation. Until very recently, discussions about overpopulation like in the1970's did not occur anymore. With the recovery of economy after the oil-price crises the topic did not get much attention any longer. As described in the first chapter of this paper, there is enough food on our planet even with the rapid population growth. It is a matter of distribution and, consequently, Malthus has been proved wrong by the fact the food production was still sufficient for the increasing number of people on our planet.

There are, however, voices in the intellectual world that point to the conclusion that the significance of the Malthusian concerns is growing again. By drawing the attention to increasing prices, to higher demand for resources and, consequently, to violent conflicts, one article in the *Wall Street Journal* reckons that the concerns made by Malthus and the Club of Rome are back on the agenda.[22] Another scholar, who publishes on the reoccurrence of Malthusian fears, is Jeffrey Sachs from the Columbia University in New York. In one of his papers he argues that much of Africa has a Malthusian crisis of high mortality, high fertility, rapid population growth and chronic extreme poverty, which ask too much of the continent's resources.[23] In another article,[24] Sachs questions the challenge of feeding and saving the planet at the same time by referring to the limits of growing and planetary boundaries.

Some predict that the debate, whether Malthus was right or not, will go on forever. By referring to the task of overcoming resource challenges as a vital precondition for the survival of our planet, Malthus probably had good cause in believing that the preservation of humanity requires a thorough analysis and decisive actions. In that sense it is not a surprise that the theories of the English scientist might get more attention in the coming years again

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[22] See Lahart, Barta & Batson (2008).
[23] See McCord, Conley & Sachs (2010).
[24] See Sachs (2009).

Conclusion

Food Security and the ever-growing population are two aspects which are very closely related. We have shown that the concept of food security is threefold. Obviously, food production becomes an issue as humankind is forced to yield a bigger output on the same amount of land without using more water in order to feed an increasing earth population. Food distribution and accessibility are two other reasons why there are people starving even though there is currently enough food being produced. Finally, food security refers to nutritional aspects with obesity being a growing concern. Therefore, we are in need of new forms of production and distribution to avoid a Malthusian catastrophe as the UN forecasts predict the world population to grow. As chapter three described, a combination of urban living and agricultural production could be one sustainable approach to tackle production deficits, environmental shortcomings and demographic shifts. Another methodology, which has the potential to significantly reduce the current uncertainties, is to genetically modify organisms. As there are changing environmental factors of productions, we are probably forced to adapt and breed new comestible goods that positively contribute to all aspects of food security. Whatever solution policy makers around the globe are pursuing, it is important that measures are put in place as the poor will suffer the most. If not, there are strong indications that Thomas Malthus had a point after all.

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Appendix

Table A1: Compound Annual Cereals Production Growth Rates (in %)

	1980-1989	1990-1999	2000-2009	1980-2009
World	2.12	0.73	2.14	1.65
Africa	3.55	2.19	3.98	2.73
Asia	3.08	1.92	2.08	2.23
North America	0.73	0.60	1.97	1.43
South and Central America	2.02	3.40	2.00	2.19
Europe	1.29	-2.98	2.14	0.29

Source: Statistical data from FAO (2011a).

Table A2: Annual Cereals Yield Growth Rates (in %)

	1980-1989	1990-1999	2000-2009	1980-2009
World	2.5	1.3	1.7	1.7
Africa	0.4	0.9	2.1	1.1
Asia	3.1	1.4	1.7	1.9
North America	2.1	2.1	2.5	2.2
South and Central America	0.6	2.2	2.4	1.7
Europe	2.7	1.3	2.1	1.9

Source: Statistical data from FAO (2011a).

Table A3: Annual Meat Production (in % to the world production)

	1980	1990	2000	2009
World	100.0	100.0	100.0	100.0
Africa	4.9	4.9	4.9	5.1
Asia	20.9	28.4	38.9	41.3
North America	19.8	17.5	17.9	16.2
South and Central America	11.1	10.7	13.5	15.6
Europe	39.9	35.5	22.1	19.3

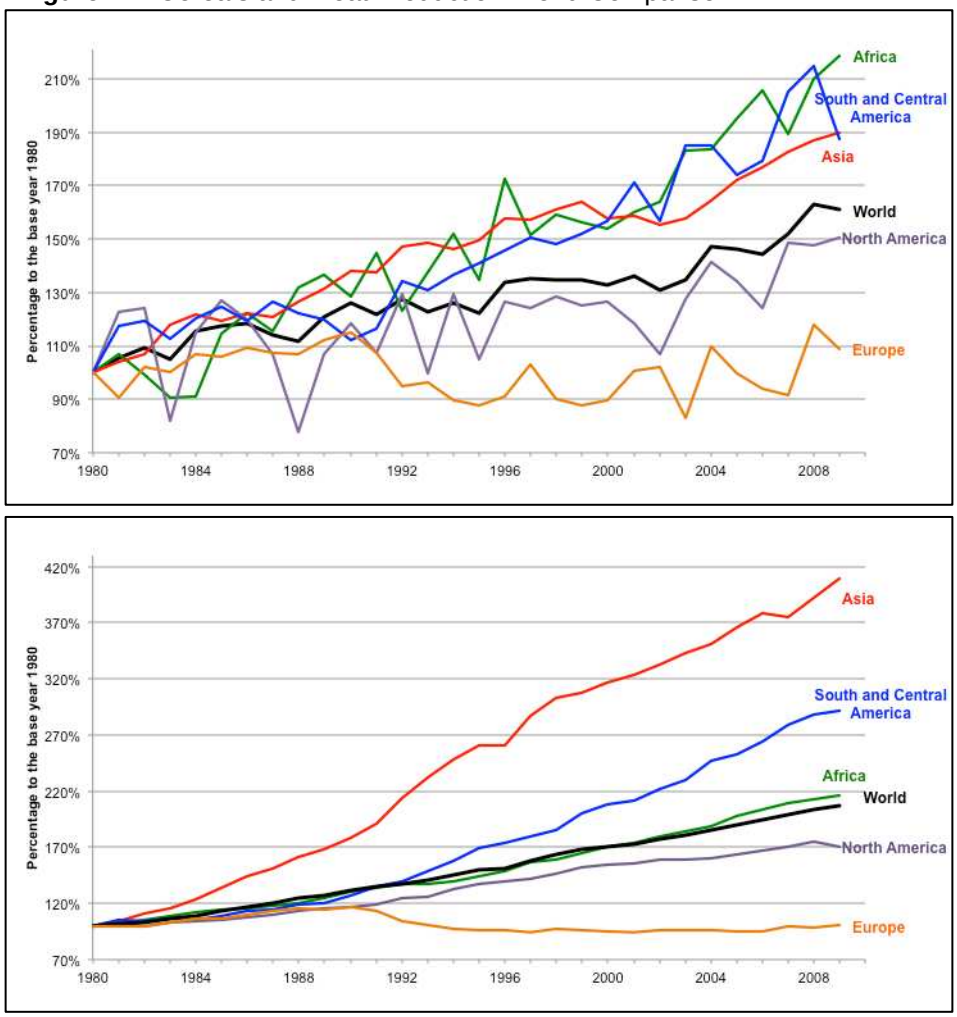
Source: Raw data from FAO (2011a).
Note. Australia and Oceania not included, categories do not sum up to 100%

Table A4: Percentage of Undernourished in Total Population

	1990-1992	1995-1997	2000-2002	2006-2008
Africa	26	26	24	23
Latin America and the Caribbean	12	11	10	8
Asia	20	16	16	15
World	16	14	14	13

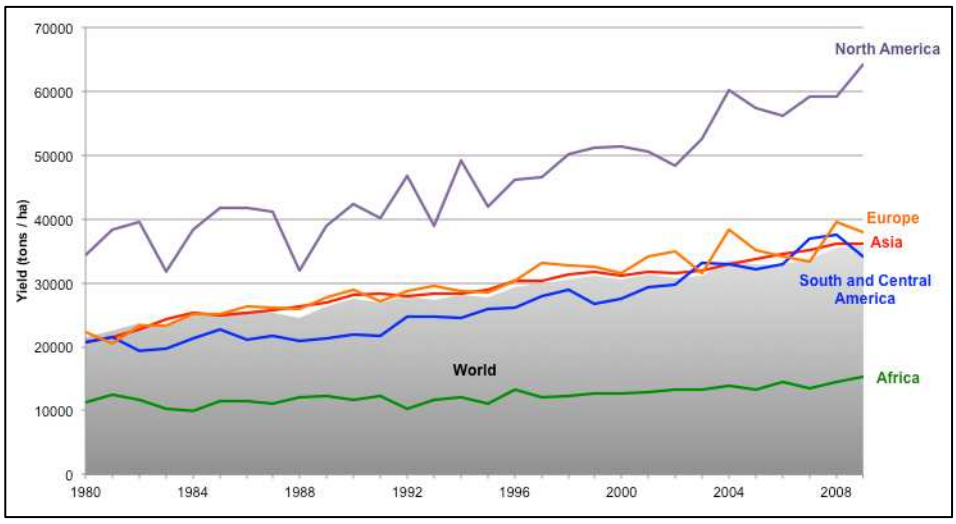
Source: FAO (2010a).

Figure A1: Cereals and Meat Production Trend Comparison



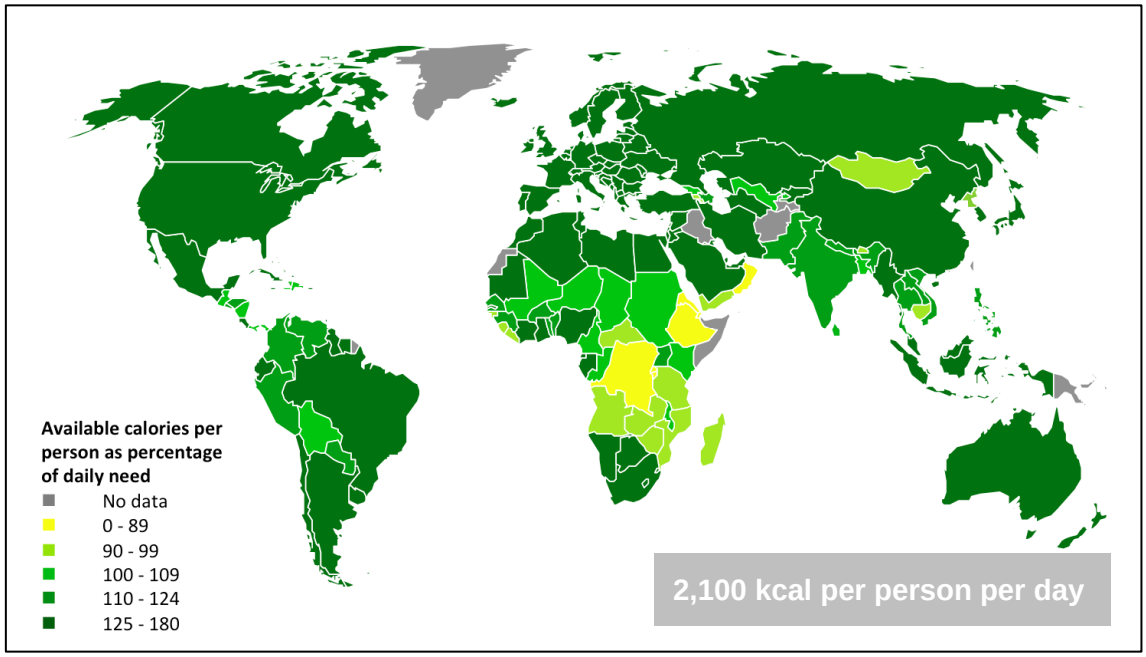
Note. Trend basis – production in tons per year (wheat, maize, rye, rice, etc.)
Source: statistical data from FAO (*Production*, 2011)

Figure A2: Cereals Yields (1980 – 2009)

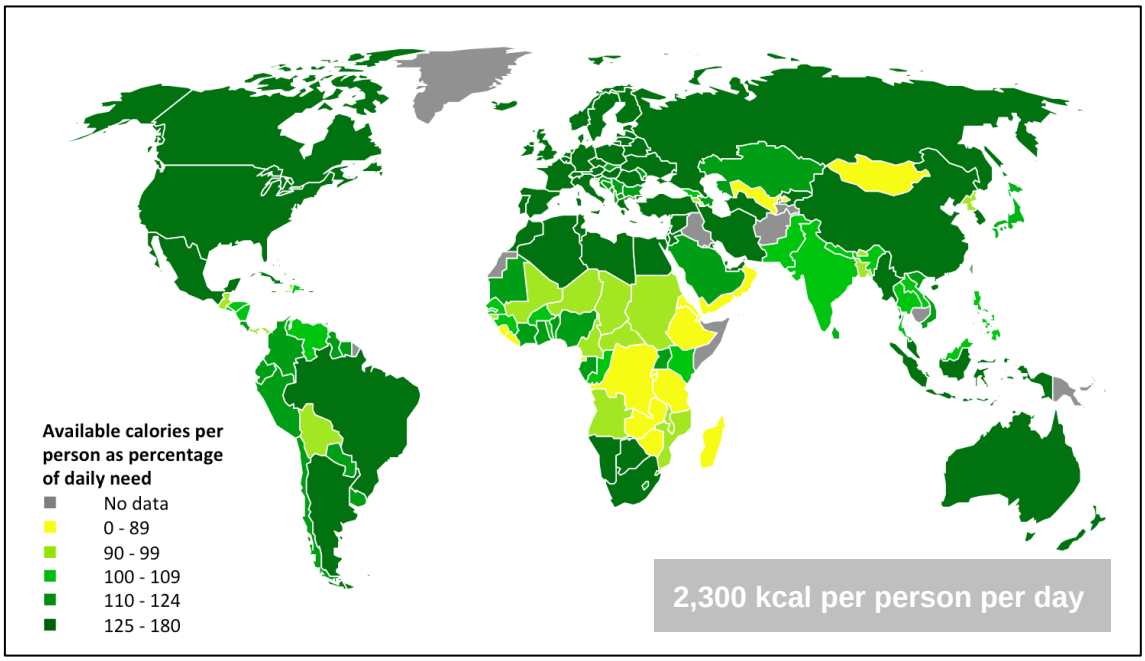


Source: FAO (*Production*, 2011)

Figure A3: Food Supply Adequacy based on Daily Energy Needs, 2007

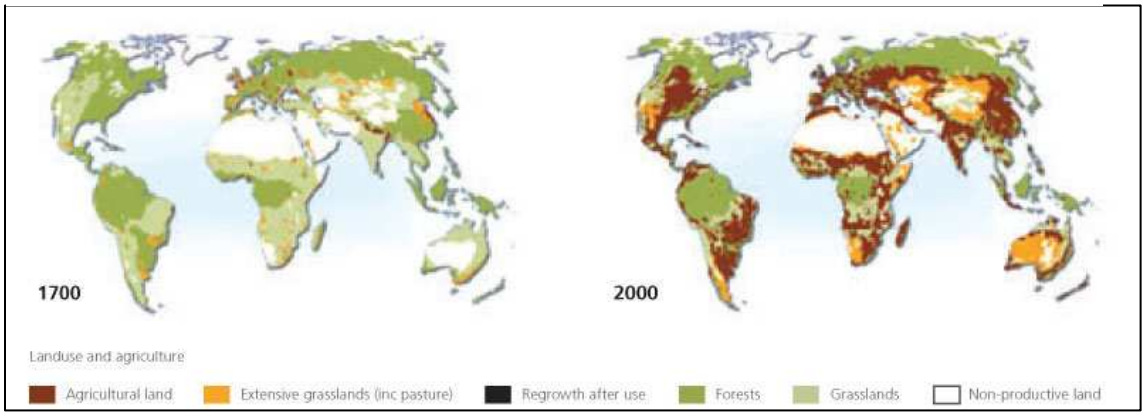


Source: Bassett and Winter-Nelson (2010, p. 18)



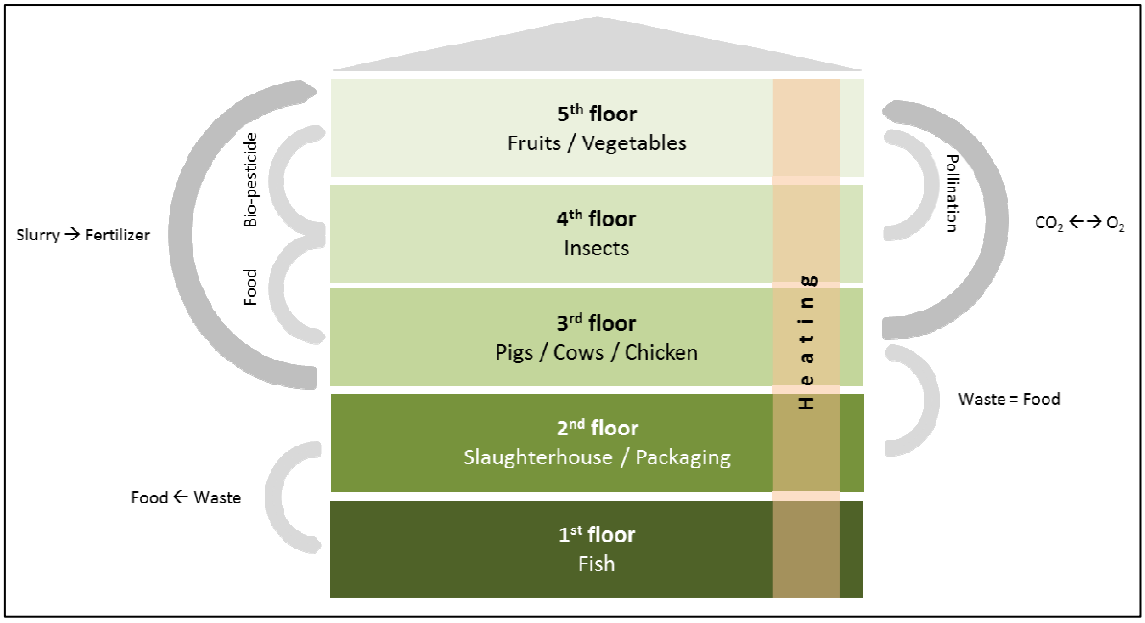
Source: Bassett and Winter-Nelson (2010, p. 15)

Figure A4: Global Agricultural Land Use (1700 vs. 2000) Based on Satellite Imagery



Source: Integrated Model to Assess the Global Environment (2009)

Figure A5: Food Park with Different Inputs and Outputs



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Demography meets the "Dependency Ratio"

The future of the "Dependency Ratio" as a planning tool for states, societies and businesses

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Executive summary

The paper analyses dependency ratios in various OECD countries in order to draw conclusions about the sustainability of social transfer systems in light of the challenges that demographic change and population ageing impose on those. Due to the projected, high increases in dependency ratios as a result of population ageing in the years until 2030, public pension, healthcare and social payments seem unsustainable. In order to assess whether the burden that old people put on the workforce is actually as high as indicated by the dependency ratio, various aspects such as life expectancy, healthy life expectancy and educational levels of the aged population are analysed. These analyses show that there are segments in the part of the population aged 65 years or older that could still contribute to the workforce. Thus, it is pointed out that the dependency ratio does not give an adequate picture of the implications of demographic change and population ageing for societies. Especially increases in life expectancy and good health of the elderly can help mitigate the challenges faced by ageing societies. In the paper, the "health-adjusted old-age dependency ratio" (HOADR) is introduced and applied to some of the focus countries. By measuring dependencies with the HOADR, which accounts for increased life expectancy and improved health conditions, a much slower increase in burdensome dependency is detected. In the light of this outcome, a more optimistic perspective is possible on the sustainability of social transfer budgets in the next 20 years for all of the analysed countries. In addition, skills (here defined as education levels) of the population are found to be another important potential that society can use in order to tackle the challenges of population ageing. This is because different studies indicate that better educated people have a higher life expectancy and are likely to contribute longer to the workforce. By combining the skill dimension (defined as at least upper secondary degree) with the health dimension (defined as healthy life expectancy without activity limitation), it is possible to show that there are remarkable differences between the selected countries. Knowing this, countries should reflect their own strategic position and take action in order to harness the economic potential of high health and skill levels in society. Today's elderly are more robust, more educated, and better placed for productive work in older life than ever before. If our societies choose not to make use of that potential, this will be their political decision — not some consequence of inescapable demographic realities. This is a very important finding, because it does not leave the policy makers in a powerless situation but gives them opportunities for action in order to manage the demographic challenge in the years to come.

Table of content

1 Introduction

The paper analyses dependency ratios in various OECD countries in order to draw conclusions about the sustainability of social transfer systems in light of demographic change. Due to the projected, high increases in dependency ratios in the years until 2030 those systems seem to be unsustainable. However, the analysis of various aspects will reveal potentials that societies can use in order to tackle the challenges of population ageing. The health-adjusted old-age dependency ratio (HOADR) will be introduced. It will be pointed out that the HOADR is expected to grow much slower than the conventional old-age dependency ratio until the year 2030. So, increases in (healthy) life expectancy are a potential that societies can use in order to ensure the sustainability of social transfer budgets in the next 20 years. In addition, skills of the population will be identified as another potential for societies in order to tackle the challenges of population ageing. Consequently, countries should take action in order to harness the economic potential of high health and skill levels in society. If societies choose not to make use of those potentials, this will be their political decision and not some consequence of inescapable demographic realities.

The paper is structured as follows: In the subsequent chapter the dependency ratio will be introduced. Additionally, some of the ratio's drawbacks and how those were discussed in literature will be highlighted. In chapter 3, the effective retirement age, life expectancy as well as health status and educational levels will be regarded closely for nine OECD countries. Afterwards in chapter 4 the sustainability of social transfer budgets in the light of demographic change will be examined for the nine OECD countries of our focus. Finally, in chapter 5 the economic potential of increases in life expectancies, improvements in health conditions as well as educational levels in a society will be highlighted. Furthermore, the strategic position of selected OECD countries with regards to health and skills will be discussed.

2 The dependency ratio and its drawbacks

Population ageing is a worldwide concern which affects all industrial and some developing countries. It refers to an increase in the number of old people, particularly relative to the total population or the number of working-age people.[25] One way to analyse changes in population age structures that is widely used by policy makers and demographers is to calculate the dependency ratio. The United Nations Population Division defines this measure as "the ratio of the sum of the population aged 0-14 and that aged 65+ to the population aged 15-64". The ratio is presented as number of dependants per 100 persons

[25] *Lee* (2007), p. 1.

of working age (15-64).[26] It indicates the potential social support requirements resulting from changes in population age structures. A high dependency ratio implies that the working population faces a great burden to support and provide the social services needed by children and retired people.[27]

The dependency ratio emerged in the 1940s and 1950s as an innovative technique to illustrate the process of population ageing. Soon it became a highly political instrument as it was frequently used to support predictions of economic crisis and intergenerational conflict.[28] According to *Crown* (1985) the dependency ratio was already commonly used in 1985 to evaluate the economic implications of population ageing and is still widely used today.[29] The United Nations consistently calculate and regularly publish dependency ratios for all countries in the world.[30] Therefore dependency data is easily available and can be used to analyse the demographic development over time and to draw comparisons between age structures of different countries.

To deal with one of the ratio's weaknesses, namely the fact that the elderly and children are assumed to be an equal burden for the people in the labour force, there exist two additional and more refined versions of the dependency ratio: The child and the old-age dependency ratio. These indicators consider the ratios of the young and the old to the working population separately (*Calasanti/Bonanno* 1986; *Gibson* 1989).[31] The child dependency ratio is defined as "the ratio of the population aged 0-14 to the population aged 15-64. The old-age dependency ratio is the ratio of the population aged 65 years or over to the population aged 15-64."[32] A high child dependency ratio implies that higher investments for child-care and education are needed whereas high old-age dependency ratios suggest added pressures for public health and pension systems.[33]

The simple definition of the dependency ratio based solely on chronological age has often been criticised in literature. The implicit assumption of the dependency ratio is that all people of working age are economically active and can support all others who are classified as dependents.[34] In turn, all dependents are assumed to be not working at all. Those assumptions are not valid as not all persons of working age are economically active due

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26 *United Nations Population Division*, World Population Prospects: The 2010 Revision, http://esa.un.org/wpp/Documentation/glossary.htm (accessed October 15, 2011).

27 *United Nations Sustainable Development Division*, www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/demographics/dependency_ratio.pdf (accessed October 9, 2011).

28 *Donoghue* (2003), p.2.

29 *Ruggeri/Zou* (2007), p. 186.

30 *Sanderson/Scherbov* (2010), p. 1287.

31 *Donoghue* (2003), pp. 3-4.

32 *United Nations Population Division*, World Population Prospects: The 2010 Revision, loc. cit. (accessed October 15, 2011).
There also exist other versions of the dependency ratio. Sometimes children are defined as the people between 0-19 years and the elderly are defined as the people aged 60 or over.

33 *United Nations Sustainable Development Division*, loc. cit. (accessed October 9, 2011).

34 *Donoghue* (2003), p.3.

to unemployment or other reasons. Besides, not all people below or above working age (15-64 years) are dependent. In some populations children already work before labour force age and old people continue being economically active at age of 65, due to postponement in retirement age or simply because they cannot afford their living from pensions only.[35] Already in the early literature, some authors, like *Clark/Spengler* (1980), *Cowgill* (1981), *Rix/Fischer (*1981) and *Crown* (1985) criticized the use of dependency ratios that do not take actual labour force participation rates into account.[36] As a way to overcome these drawbacks of the dependency ratio *Crown* (1985) analysed actual labour force participation rates taking age and gender into account and determined age- and sex-specific dependencies. His method considered unemployment as well as labour force participation of people who were younger or older than the defined labour force age. The advantage for policy-makers of a decomposition of the dependency ratio into age- and sex-specific dependencies is that the more dependent groups in the population can be identified and targeted for concrete policy initiatives.[37]

Another aspect of the dependency ratio that was criticized in literature is that it does not take the global trend of increased life expectancy into account. The ratio uses a fixed threshold of 60 or 65 years to classify people as old and dependent. The fact that is ignored by such a procedure is that people do not just get older, on average, but have longer remaining life expectancies.[38] Therefore, several authors started to account for life expectancy when analysing population ageing. In 1975, *Ryder* (1975) came up with the idea to categorise people as old when they have reached a fixed number of years of remaining life expectancy. Following this theory, *Sanderson/Scherbov* (2008a) defined old age as beginning at 15 years of remaining life expectancy and determined the "prospective old-age dependency ratio" as the ratio of the people who have a remaining life expectancy of 15 years or less to the people who are at least 20 years old and have a remaining life expectancy of more than 15 years.[39] For the period from 1955-2045, they found out and projected that the prospective old-age dependency ratios were lower and increased at a lower rate than conventional old-age dependency ratios. This indicates that the problem of population ageing might not be as severe as suggested by the conventional (old-age) dependency ratio.[40]

Furthermore, the ratio disregards the fact that health improvements of the elderly could mitigate the rise in demand for, and hence expenditure, on long-term health-care and

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35 United Nations Sustainable Development Division, loc. cit. (accessed October 11, 2011); Groth/Tripple (2011), p. 6.

36 Crown (1985), p. 166.

37 Crown (1985), p. 167.

38 Sanderson/Scherbov (2008a), p. 7.

39 *Sanderson/Scherbov* (2008a), pp. 10-11; *Sanderson/Scherbov* (2010), p. 1287.

40 *Sanderson/Scherbov* (2008b); *Sanderson/Scherbov* (2010), p. 1287.

thereby reduce the burden that old people impose on the labour force.[41] Besides, an increased number of years of healthy life at old ages could justify an increase of the pension age, which would result in less people being dependent and more people being in the labour force.[42] These are reasons why the health situation of the elderly was studied in recent years and ways to include the results into a measure of dependency were sought. *Menton/Gu/Lumb* (2006) analysed the health situation of the people aged 65 or over in the United States. They found that the "active life expectancy", i.e. the number of years of life spent in a healthy or non-disabled state [see e.g. *Robine/Saito/Jagger* (2009)] is forecasted to rise steadily until 2080. However, *Lafortune/Balestat* (2007), who studied trends in severe disabilities among the elderly in 12 OECD countries, could only prove a rise in active life expectancy in five of the twelve countries. In the others they found stable rates or increases in disability among the elderly. *Sanderson/Scherbov* (2010) developed a disability-adjusted ageing measure, the "adult disability dependency ratio". It is defined as "the number of adults at least 20 years old with disabilities, divided by the number of adults at least 20 years without them." They analysed 10 OECD countries and found that the adult disability dependency ratio increased slower than the conventional old-age dependency ratio.

It becomes clear that the conventional dependency ratio can no longer provide an accurate picture of population ageing due to the many factors that are not considered in the calculation of the ratio. In the following we will perform various analysis in order to develop an own measure of ageing which can be used as a more accurate planning tool for states, societies and businesses.

3 Dependency ratios and related analyses in OECD countries

We selected nine OECD countries for our further analysis: Germany, Switzerland, France, UK, Japan, the USA, Hungary, Mexico and Turkey. Germany, Switzerland, France, UK, the USA and Japan represent the group which will be facing a serious demography shift in the next decade as a high amount of people will reach the present retirement age (compare chapter 4). Also, these countries represent 37% of world GDP[43] and hence do have a serious impact on the world economy as a whole. Switzerland and Japan are also interesting to look at since these countries have one of the highest life expectancy in the world. In addition, Japan already is nowadays the country with the highest dependency ratio. Hungary represents an Eastern European country and is not yet having such a high life expectancy and finds itself at a different demographic situation. Its

41 *Lafortune/Balestat* (2007), p. 4.
42 *Sanderson/Scherbov* (2010), p. 1288.
43 *International Monetary Fund*, http://www.imf.org/external/pubs/ft/weo/2011/02/weodata/weoselco.aspx?g=110&sg=All+countries+%2f+Advanced+economies (accessed November 5, 2011). Based on own calculation.

economy is in a transition phase since it entered the European Union in 2004. Mexico and Turkey are interesting examples of developing countries. Turkey has seen an economic growth in recent years and there is dynamic in the country that they might be able to enter the European Union.

In order to analyse the adequacy of the dependency ratio's assumption that people are dependent after the age of 65 we look at the effective retirement ages in our selected countries. The effective retirement age is the age at which people actually leave the labour force market, as compared to the official retirement age which is specified by legislation and is the age at which people can first draw full pension benefits without actuarial reduction for early retirement.[44] Figure 1 shows the effective retirement age for our selected countries for the period 2005-2009:[45]

Men		**Women**	
	Effective		Effective
Mexico	72.2	Mexico	69.5
Japan	69.7	Turkey	68.3
Switzerland	65.7	Japan	67.3
United States	65.5	United States	64.8
United Kingdom	64.3	Switzerland	63.5
Turkey	62.8	United Kingdom	62.1
Germany	61.8	Germany	60.5
Hungary	60.0	France	59.7
France	59.1	Hungary	58.9

Figure 1: Effective retirement age in selected OECD countries.

The effective retirement age in our selected countries varies from 58.9 - 72.2 years. This indicates that the assumption that people are dependent after the age of 65 is not valid for all countries. In five of the nine selected countries (those marked in blue) men, women or both work longer than 65 years and are therefore not yet dependent at the age of 65. However, in seven out of the nine countries (those marked in grey) men, women or both leave the labour force market before the age of 65. Having those insights in mind it becomes clear that the dependency ratio does not provide an adequate picture of the burden that the elderly impose on the labour force. In those countries where the effective retirement age is higher than the threshold of 65 years, the burden on the workforce will be overestimated by the dependency ratio. In those countries where people exit the labour force market before the age of 65, the dependency ratio will underestimate the burden on

[44] *OECD* (2011a), pp. 13, 20.
[45] *OECD*, http://www.oecd.org/document/47/0,3746,en_2649_34747_39371887_1_1_1_1,00.html (accessed October 28, 2011).

the workforce. We will come back to that issue in chapter 5 when we propose improvements to the simple calculation of the dependency ratio.

Let us have a look how the life expectancy has developed over time and how it is expected to develop until the year 2035, since this explains partly the increase of the dependency ratio. Figure 2 shows clearly how the life expectancy has been increasing over the last 60 years in all the selected OECD countries.

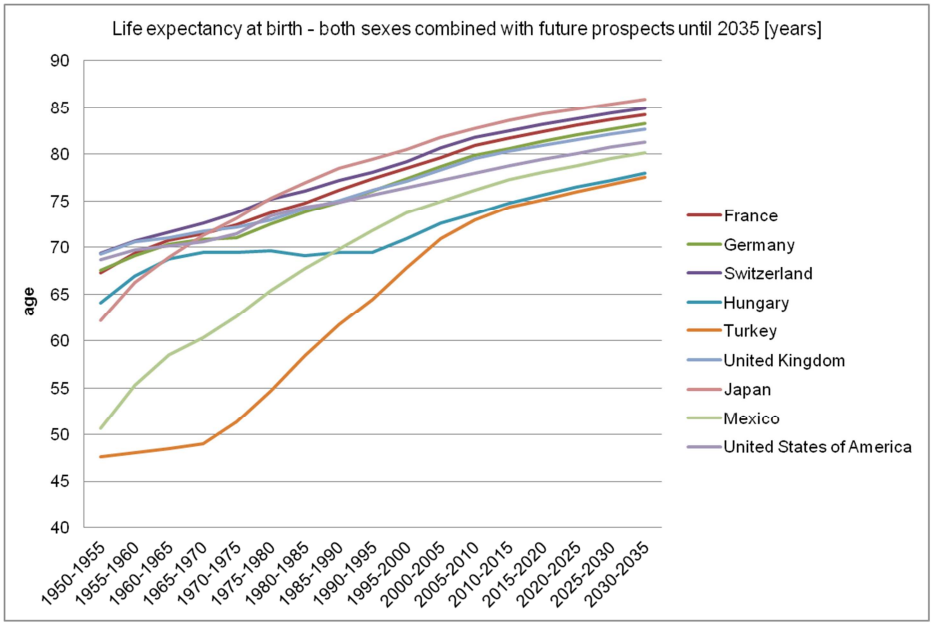

Figure 2: Life expectancy at birth – both sexes combined with future prospects until 2035 in years.[46]

The less developed economies such as Turkey and Mexico started in the 1950 from a significantly lower level (47.6, 50.7 years respectively). There is a trend that all the selected countries converge on a higher level in terms of life expectancy. The range in the fifties was between 47.6 and 69.3 (Switzerland) years (delta 21.7) whereas it is nowadays between 73.0 (Turkey) and 82.7 (Japan), delta only at 9.7. Hungary has seen a comparable flat increase of life expectancy. In the analysed period it increased only 9.6 years, from 64.0 to 73.6 years.

Figure 2 shows that the trend towards a longer life expectancy at birth will continue. However, the increase is expected to get flatter in the years to come. The selected countries converge further, the delta in the years 2030 to 2035 is expected to be at 8.4 years (between Turkey and Japan).

It also gets clear that at the time of the introduction (1940s and 1950s as mentioned in chapter 2) of the dependency ratio the live expectancy was significantly lower. This means

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46 *United Nations Population Division*, World Population Prospects: The 2010 Revision, loc. cit. (accessed October 9, 2011).

that the dependency ratio also was lower (as you can see in chapter 4), and therefore the time spent in retirement is considerable longer since the official retirement age has not been raised significantly. Figure 3 shows us the years in retirement for men and women in 2009 of the selected OECD countries.[47]

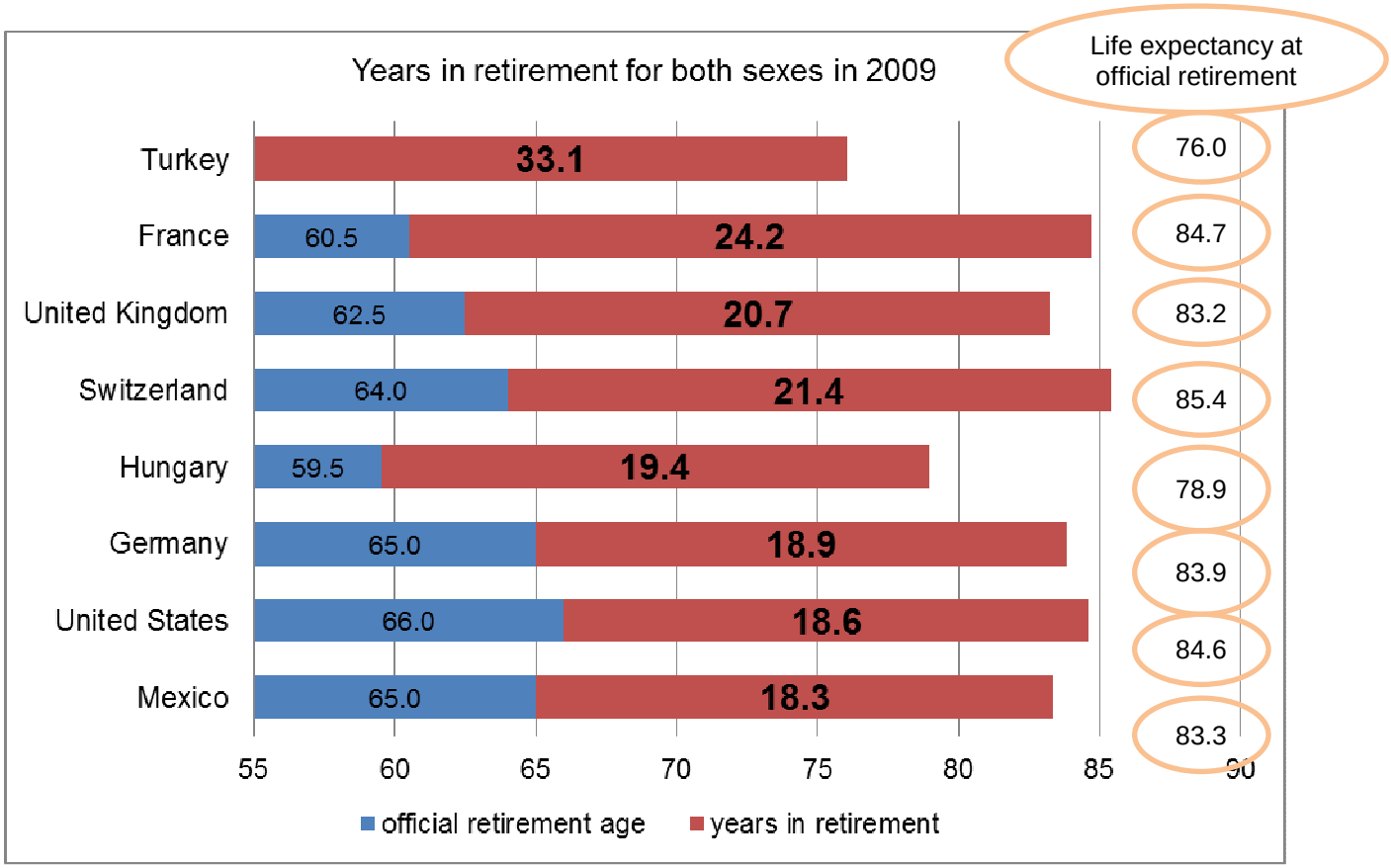


Figure 3: Years in retirement for both sexes in 2009, official retirement age and life expectancy at official retirement age

On average in the whole OECD women have five more pensionable years than men. On the one hand, because of their higher life expectancy on the other hand because of their earlier official entitlement age at least in some countries. The official entitlement age varies between 60 and 66 for men and between 59 and 66 for women. Mexico, France, Germany and the USA already have the same official entitlement age for women and men. Turkey represents an exception, since the policy makers defined a very low official retirement age in order to fight unemployment.

Expressed in percentage, we can state that men spend 22% and woman even 26% of their lifetime in retirement. In other words, with higher life expectancy the people spend a longer time in retirement nowadays almost a quarter of the whole lifetime. It makes sense getting a better understanding of the health conditions of this age group. Figure 4 shows

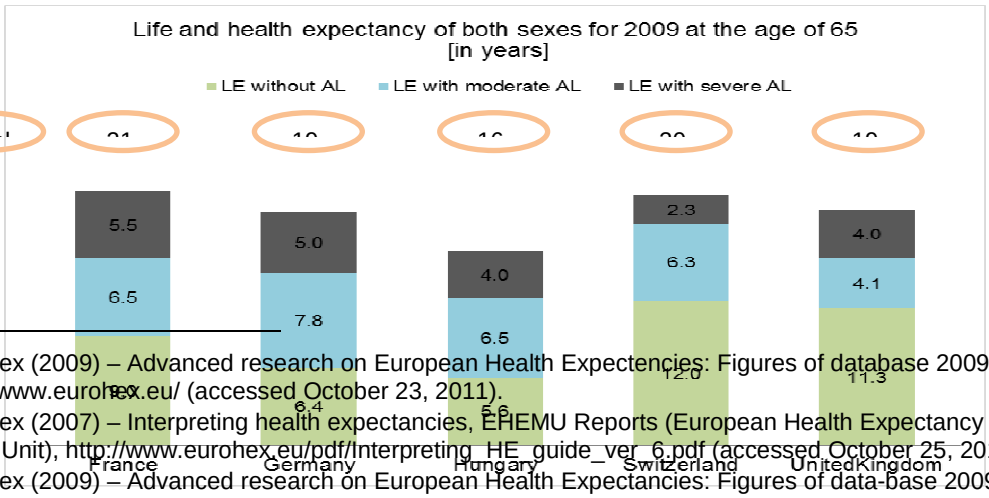
47 *OECD* (2011b).

the healthy life expectancy at the age of 65 in the year 2009 for men and woman (only for European countries though, since they provide comparable figures).[48] Health expectancies are a natural extension of the well known indicators of life expectancies. Life expectancies measure the number of remaining years to be lived at a particular age, considering the current mortality level of the country. For example in 2004 the female life expectancy at birth in Belgium was 81.4 years, so a baby girl born in 2004 could expect to live to age 81 years, assuming the conditions of 2004 prevailed over her whole life. By considering not only mortality but also ill-health at particular ages we can divide this remaining number of years into years spent in good and bad health – these are then health expectancies. Health expectancies add a quality dimension to the quantity of life lived.

Health expectancies are a relatively new concept and there are different dimensions, therefore we have a closer look at the definition.[49] We work with the newly proposed EU structural indicator Healthy Life Years (HLY) which is based on limitations in daily activities and is therefore a disability-free life expectancy. It is one of the most common health expectancies reported. In general, health expectancies take into account both the changes in living with a disability and the changes in mortality which are responsible for the increase in life expectancy. It is a potent tool to identify the interaction between health, ill-health and mortality.

The difference between these countries is remarkable. Life expectancy without activity limitation is at the age of 65 in Switzerland 12.0 years, in the UK 11.3 whereas Germany and Hungary are much lower with 6.4 and 5.6 years respectively. France lies in the middle with 9.0 years that 65 year old people can spend on average without activity limitation.[50] This could be an indicator how long people might be able to contribute to the work force.

We also found considerable differences of years spent after 65 with severe activity limitations: Switzerland represents with only 2.3 the lowest figure, and France the highest with 5.5 years spent with severe activity limitation. We assume that these difference correlates negatively with social costs.



[48] Eurohex (2009) – Advanced research on European Health Expectencies: Figures of database 2009, http://www.eurohex.eu/ (accessed October 23, 2011).

[49] Eurohex (2007) – Interpreting health expectancies, EHEMU Reports (European Health Expectancy Monitoring Unit), http://www.eurohex.eu/pdf/Interpreting_HE_guide_ver_6.pdf (accessed October 25, 2011).

[50] Eurohex (2009) – Advanced research on European Health Expectancies: Figures of data-base 2009, http://www.eurohex.eu/ (accessed October 23, 2011).

Figure 4: Life and health expectancy for both sexes in 2009 at the age of 65 [in years][51]

The figures about health expectancies show the average person. Therefore it would be worth to know whether there are specific segments of the population that are healthier than others. In other words, the part of the population that will outperform the others on their health conditions is hence more likely to contribute a longer time to the workforce. Our research revealed that academics live significantly longer and are longer at good health.[52] Let us take closer look at the Swiss study, representing the others with similar findings. “At ages 30, 50, 65 and 80 men with university education lived 7.1, 5.4, 3.5 and 1.6 years longer than their counterparts with compulsory education or less. In women the corresponding differences were 3.6, 3.1, 2.7 and 2.2 years.”[53] The authors conclude further that the “educational gradients in life expectancy are substantial, particularly among young and middle-aged men. Social policies and public health strategies should address this situation.”[54]

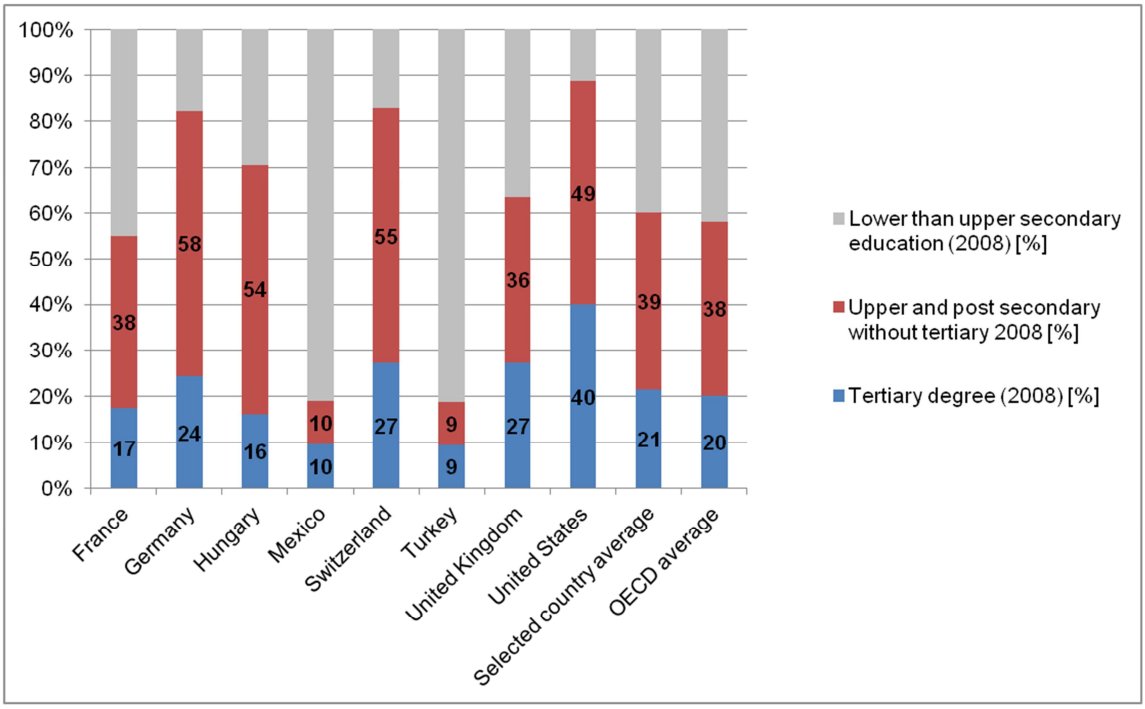
51 We only show the figures of European Countries because only Eurohex provides comparable data and since 2008 they are collected in a more standardized way.

52 *Bopp* (2006); (Brunner 1991).

53 *Bopp* (2006), p. 145.

54 *Bopp* (2006), p. 145.

Figure 5 therefore shows the different education levels divided in the three categories "lower than secondary education", "upper and post secondary" and "tertiary degree". The extremes are represented by the USA, 89% having at least upper secondary educations level whereas Turkey only has 18%. But also between countries at economical comparable situations there are significant differences: In Switzerland 82% possess at least an upper secondary education, in France only 55%.[55] The educational level is clearly related



to the health conditions. On the other hand we assume that better educated people are more likely to contribute to the workforce for a longer time.

Figure 5: Education level of the population at the age between 55 and 64 (2008) [%]

4 Sustainability of social transfer budgets

4.1 Introduction and Methodology

In this section, we proceed by analysing whether social transfer systems in our selected countries can be sustainable in light of the upcoming demographic change. For each country, we take relevant components of government expenditure into account and question the sufficiency of their financial resources to be able to achieve the same level of redistribution of wealth as these countries do today over the next 20 years, as the population grows older.

55 *OECD* (2011c).

In most OECD countries, including the states that we focus on, the primary source of government income is tax in the form of "value-added tax" from goods and services, as well as "tax on income and profits". Combining these two components give the total tax burden on the workforce of a country.

On the expenditure side of this balance (and sometimes imbalance resulting in account deficit or surplus), the primary components of public expenditure are listed as public expenditure on health, public pension expenditure, and public social expenditure in official OECD database.[56] Of these three items of expenditure, we mainly focus on public pension expenditure and public expenditure on health in our sustainability analysis of selected ageing populations, as they are closely linked to dependency issue. Older side of a population has a higher demand for medical care and pension payment.

Sustainability of the current level of redistribution of wealth depends on a stable source to finance public expenditures. In other words, stable inflow of value from taxpayers is needed. As some of the most developed nations in today's world undergo significant demographic change with possible implications on the balance of the redistribution of wealth over the next 20 years, we analyse these implications in each country by using dependency ratio.

We proceed in our study with analysis of our selected countries.

4.2. Analysis of selected countries

Our selected countries have different government income and public expenditure characteristics. We take into account tax revenue and public expenditure of each country as a percentage of GDP. Using percentage measures instead of monetary values gives insights about the upcoming challenges that the nations may face regarding the "degree" of redistribution of national wealth among different age groups in each society. Eventually, possible changes in the distribution of wealth give a clue about the sustainability of income equality and social balance. Public expenditure and tax income for selected countries can be found in our appendix.

Together with public expenditure and tax revenue items, we take into account United Nations population forecasts for different age groups over the next 20 years to analyse the sustainability of social transfer budgets by using dependency ratio.[57]

We proceed with detailed analysis of each selected country.

FRANCE

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[56] *OECD.* http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html (accessed October 18, 2011).

[57] *United Nations Population Division*, World Population Prospects: The 2010 Revision, http://esa.un.org/wpp/Documentation/glossary.htm (accessed October 18, 2011).

According to the data given by OECD, information about revenue and expense items for the year 2005 are given as follows: Public expenditure comprises mainly health expenditure (8.8% of GDP), social expenditure (29.2% of GDP), and pension expenditure (10.6% of GDP). On the revenue side; total tax revenue corresponds to 43.9% of GDP, while total tax burden on the average worker was 50% of labour cost.[58]

Dependency ratio and old-age dependency ratio values for France are calculated for each 5 years until 2030 according to population forecasts by United Nations. Values are given in the table below.

FRANCE	Dependency Ratio	Old Age Dependency Ratio
2005	61	32
2010	63	34
2015	68	39
2020	72	43
2025	75	46
2030	81	51

The implications of an increase in the dependency ratio from 61 in 2005 to 81 in 2030 seem to be significant. Such an increase implies that either taxes have to be raised in order to sustain the same amount of pensions for an increased number of pensioners or the amount of pension payments would have to be reduced, which would lead to income inequality between the working and the retired people. Using dependency ratio, we find out that the social stress gets higher in the process of demographic change.

Regarding old age dependency ratio, looking at the pension expense figure of France is especially important. In the given time frame (2005-2030), old age dependency ratio for France changes from 32 to 51, which indicates an emerging problem for France: Without budget adjustments especially in public pension expenses, the current resource seems to be not sustainable to keep current equality level in income distribution, putting the life standards of the elderly at risk.

To sum up, social transfer budget for France is not sustainable according to our analysis using dependency ratio and old age dependency ratio.

GERMANY

Our analysis of Germany leads us to similar results. While expenditure on health (8.2% of GDP), social expenditure (26.7% of GDP), and pension expenditure (11% of GDP) represent a very high fraction (see details in appendix) in German public social expenditure, total tax revenue corresponds to 34.8% of GDP and on average a worker pays roughly 53% of labour cost as tax to the government.[59]

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[58] *OECD iLibrary*: Statistical Profile of France, http://www.oecd-ilibrary.org/economics/country-statistical-profile-france_20752288-table-fra (accessed October 18, 2011).

[59] *OECD iLibrary*: Statistical Profile of Germany, http://www.oecd-ilibrary.org/economics/country-statistical profile-germany_20752288-table-ger (accessed October 18, 2011).

GERMANY	Dependency Ratio	Old Age Dependency Ratio
2005	56	35
2010	59	39
2015	61	42
2020	68	48
2025	75	53
2030	86	62

While dependency ratio moves from 64 in 2005 to 82 in 2030, Germany is on a challenging way of sustaining income equality. Our analysis indicates that the sustainability of German social transfer budget is at stake. In order to keep the current degree of redistribution of wealth, tax rates would have to increase to a level that might cause social unrest, as the tax burden on workers is already quite high.

In terms of old age dependency ratio, the picture gets even worse. Given the 60% increase from 35 in 2005 to 62 in 2030, the sustainability of the level of pension expenditure is in question. One solution to this problem could have been changing the composition of the overall social transfer budget to include more benefits for the elderly. However, since the overall dependency ratio for Germany also increases, this indicates a shortage of financing in other components of the budget as well. There is no solution but to increase the relative share of social transfer budget, which seems impossible given the (already) high tax rate.

JAPAN

In Japan, as public expenditure on health and public pension expenditure corresponded to 6.7% and 7.4% of GDP respectively in 2005, 18.6% of GDP went to public social expenditure alone (see appendix for details).[60] While the relative share of social transfer in GDP is lower than the social transfer shares in France and Germany, implying a higher possibility to increase the social transfer budget compared to these two countries, the same budget ratio to cover the future needs of Japan seems to be not applicable, if the current standard of living is to be sustained. Values are given in the table below.

JAPAN	Dependency Ratio	Old Age Dependency Ratio
2005	58	37
2010	66	45
2015	78	56
2020	85	64
2025	90	69
2030	97	75

Looking at the projected dependency ratios of Japan, it becomes clear that Japan necessitates allocating a higher amount of financial resources to the dependent part of their population in order to meet their needs. As taxes on average worker represent approximately 28% of labour cost, this value appears to be not sustainable either. Given the need for the financing of future social transfer budget, tax increases for Japan could be helpful.

60 *OECD iLibrary*: Statistical Profile of Japan, http://www.oecd-ilibrary.org/economics/country-statistical-profile-japan_20752288-table-jpn (accessed October 18, 2011).

Given the two-fold increase in old age dependency ratio in years between 2005 and 2030, especially pension budget seems to be unsustainable and the weight of this budget item has to be increased by imposing higher taxes. Relatively low tax rate seems to be the most important advantage of Japan over Germany and France in coping with increasing social transfer needs.

MEXICO

As a developing country with a relatively stable demography trend in 20 years, Mexico is expected to have a lower dependency ratio in 20 years.

MEXICO	Dependency Ratio	Old Age Dependency Ratio
2005	60	11
2010	57	12
2015	54	13
2020	53	15
2025	52	18
2030	52	21

However, as old age dependency ratio implies, the composition of non-working population is expected to shift towards the elderly. Since only 1% of GDP was transferred to pension coverage as public expense in 2005, there may be difficulties in sustaining this rate until 2030 given the old age dependency ratio that increases almost two-fold.[61] On the other hand, given the insignificant share of pension expense in government expenditures in 2005, covering pension needs in 20 years seems achievable. Sustainability of social transfer in Mexico can be achieved by only changing the composition of the budget. Decrease in dependency ratio would probably make some financial source available to cover the needs of the aged part of Mexican population.

HUNGARY

Like the other European countries that we have analysed so far, Hungary transfers a large fraction of its social budget to social spending (22.5% of GDP). Furthermore, public pension expenditure and public expenditure on health account for 8.3% and 6.0% of GDP, respectively.

HUNGARY	Dependency Ratio	Old Age Dependency Ratio
2005	51	28
2010	51	30
2015	54	32
2020	60	36
2025	63	39

[61] *OECD iLibrary*: Statistical Profile of Mexico, http://www.oecd-ilibrary.org/economics/country-statistical-profile-mexico_20752288-table-mex (accessed October 18, 2011).

2030	64	40

Although the increase in dependency ratio and old age dependency ratio does not urge radical changes in social policy and budget adjustment, increasing rates still point out a challenge to be faced by Hungarian policy makers. Adjusting government budget to cover pension needs seems necessary, given the old age dependency ratio that is expected to increase to 40%.[62] However, since the tax burden on workforce was approximately 51% of overall labor cost in 2005, increasing taxes further to satisfy social needs may have negative economical implications.

TURKEY

With high young population that is projected to join the workforce in the next decades, Turkey's dependency trend over the next 20 years show similar patterns with Mexico. The main components of social transfer budget; expenditure on health (4.1%), social expenditure (13.7%) and pension expenditure (6.3%); represent a lower fraction of GDP compared to the developed countries of our focus. Furthermore, tax on the average worker (42.8%) is lower than that of Germany and France. Taking both social transfer budget ratios and tax rate on the average worker in Turkey into consideration, since both items have a lower fraction in, we find out that Turkey has a lower rate of redistribution of wealth compared to Germany and France[63].

TURKEY	Dependency Ratio	Old Age Dependency Ratio
2005	52	09
2010	49	10
2015	47	11
2020	47	13
2025	46	16
2030	47	19

Nevertheless, taking into consideration the dependency ratio figures, values in the next 20 years do not mean too much harm to the sustainability of overall social transfer budget. As dependency ratio decreases, increase in old population can be compensated by adjusting the pension budget without affecting Turkey's overall social transfer expenditure.

SWITZERLAND

SWITZERLAND	Dependency Ratio	Old Age Dependency Ratio
2005	54	30
2010	54	32
2015	58	36

[62] *OECD iLibrary*: Statistical Profile of Hungary, http://www.oecd-ilibrary.org/economics/country-statistical-profile-hungary_20752288-table-hun (accessed October 18, 2011).

[63] *OECD iLibrary:* Statistical Profile of Turkey, http://www.oecd-ilibrary.org/economics/country-statistical-profile-turkey_20752288-table-tur (accessed October 18, 2011).

2020	62	40
2025	69	45
2030	78	53

As Swiss population grows older, Switzerland faces the same situation as her northern neighbours do. Since both dependency ratio and old age dependency ratio are expected to increase significantly, the social transfer budget of Switzerland (exp. on health: 6.7%, social exp.: 20.3%, pension expenditure: 6.4% of GDP) appears to be unsustainable. Further financing to cover increasing social transfer costs will be required.[64] Tax increase might be a solution since the average tax burden on the workforce is currently about 29% of labour cost. Increasing tax rates to compensate for the increase in dependency in the form of the need for social contribution seems possible to some extent. Nevertheless, the obvious need in higher social spending indicates that the current social transfer budget of Switzerland is not sustainable.

UNITED KINGDOM

UK	Dependency Ratio	Old Age Dependency Ratio
2005	58	31
2010	58	32
2015	62	35
2020	65	37
2025	68	40
2030	73	45

Like other developed nations, the United Kingdom is undergoing a significant demographic change. With a composition of social transfer budget that is similar to that of Germany, France and Switzerland; the UK will face the same demographic challenge with lower intensity. As the expected change in dependency ratio and old age dependency ratio is less significant compared to France, Germany and Japan; the picture is not very pessimistic. Moreover, given the tax rate of approximately 34% in 2005, dealing with demographic challenge seems possible. However, using dependency ratios still lead us to the conclusion that the budget for the UK will not be sustainable in the future, as a budget increase relative to GDP will be needed.

UNITED STATES

The expected change in dependency ratios over time for the US is similar to that of United Kingdom. The ratio values indicate the demographic challenge that American policy makers will have to face. In other words, US social transfer budget will need adjustments. Especially in

64 *OECD iLibrary*: Statistical Profile of Switzerland, http://www.oecd-ilibrary.org/economics/country-statistical-profile-switzerland_20752288-table-che (accessed October 18, 2011).

US	Dependency Ratio	Old Age Dependency Ratio
2005	54	24
2010	55	25
2015	59	28
2020	62	31
2025	67	36
2030	73	41

terms of old age dependency ratio, in order to keep the current level of redistribution of wealth, the pension budget in 2005 (5.3%)[65] will have to be revised. Moreover, since dependency ratio is also increasing, this indicates that the overall social transfer budget cannot be sustained in the long run either.

As an increase in social transfer budget is required to keep the current level of income equality, sourcing for this compensation is the next question. As the average tax burden was about 30% of the labour cost in 2005, increasing tax rates can be an option. However; the possibility of social unrest that may result from tax increase should be considered carefully, taking into consideration the general negative political view of the American society on wealth redistribution.

All in all, the obvious need for a higher share of social transfer in GDP means that the current social transfer budget is not sustainable for US economy. It is again worth pointing out that this judgment is made based on the dependency ratio, ignoring the inherent limitations of the tool.

4.3 Summary

We have analysed the sustainability of social transfer budgets for 9 OECD countries using dependency ratio. We can conclude that for the countries which have increasing old age dependency ratios while having relatively stable or lowering dependency ratios, social transfer budgets are sustainable with necessary adjustments in the composition of public expenditure. However, for the countries that face demographic challenge with increasing total dependency ratio, the sustainability of social transfer budgets is questionable, especially in the case of sharp increases expected in the next 20 years. In the occasions where budget adjustments are needed, average tax burden on a country's workforce can be taken into account to decide if further wealth redistribution is possible without any side effects.

It is important to point out, for this section of sustainability analysis, that judgments are made within the limits of „dependency ratio" tool. In our opinion, there are many factors to be taken into account in social budget planning for the next decades. In this sense, „dependency ratio" may fail to explain some factors that would be worth taking into account to come to a conclusion about how fierce the "demographic challenge" is.

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[65] *OECD iLibrary*: Statistical Profile of United States, http://www.oecd-ilibrary.org/economics/country-statistical-profile-united-states_20752288-table-usa (accessed October 18, 2011).

In the next section, we proceed with recommendations for improving the dependency ratio.

5 Adjustments to the dependency ratio

5.1 Effective retirement age

As analysed in chapter 3, the (old-age) dependency ratio does not take effective retirement ages into account. Therefore the burden that the elderly impose on the workforce will be overestimated in some countries and underestimated in others. In order to get an adequate picture of the challenges that population ageing might bear for a country, the dependency ratio might be improved by replacing the fixed threshold age of 65 by the effective retirement age in each country. However, our approach of improving the planning impact of the dependency ratio will focus on other aspects.

5.2 Healthy life expectancy

As we discussed, the topic of increases in healthy life expectancy in some of the countries of our focus is one of the key points of departure in questioning the adequacy of the dependency ratio for policy making. As explained earlier, life expectancy at the age of 65 can be analysed in three different phases: Without activity limitation (AL), with moderate AL and with severe AL. According to the statistics in Chapter 3, not only the life expectancies of our focus populations increased but also the healthy years without activity limitation after the age of 65. As a consequence of this development, it may be worth to redefine "aged population". In our opinion, the definition of "old" becomes more and more relative to multiple dimensions such as health, living standards, and day-to-day habits. In their article "Rethinking Age and Aging", *Sanderson/Scherbow* (2008a) elaborate on "Redefining Old Age". They argue that "measures that do not take variations in remaining life expectancies into account can miss an essential element. Ageing is not only about the fact that people in a population are, on average, older. It also means that these older people are healthier […] than their earlier counterparts."[66] Rises in healthy life expectancy make working past the traditional retirement age a new and so far not utilised option.[67] Therefore, our suggestion, given the consideration of increasing healthy life expectancy, would be to increase the upper threshold (65 years) in the dependency ratio by adding the years without AL that the aged people in each country can expect to enjoy after the age of 65. Frightening projections of the old-age dependency ratio neglect the enormous economic potential of "healthy ageing". Today's elderly are more robust, more educated, and better

66 *Sanderson/Scherbow* (2008a), p. 7.

67 *Trippel/Groth* (2011), p. 6.

placed for productive work in older life than ever before.[68] This new measure would yield much more optimistic results for countries like France, Germany and Japan. If our societies choose not to make use of the potential, that will be their political decision — not some consequence of inescapable demographic realities.[69]

To exemplify our idea, we take a closer look at France, Germany and Switzerland to apply our suggested health-adjusted old age dependency ratio (HOADR). In France, life expectancy without activity limitation is 9 years. Since it would not be realistic to expect the majority of the population to work until the age of 74 (65 yrs +9 yrs w/o AL), adjusting the upper limit from 65 to 70 for France, taking only 50% of life expectancy w/o AL into consideration, would yield significantly different results. Making a similar adjustment for Switzerland (LE at 65 yrs. w/o AL: 12 years, upper limit adjustment: 71 years), and Germany (LE at 65 yrs. w/o AL: 6 years, upper limit adjustment: 68 years) would result in the following values for health-adjusted old-age dependency ratios in 2030, given in comparison with old-age dependency ratios for the same countries in the years 2005 and 2030:

	Old - Age Dependency Ratio (2005)	Old-Age Dependency Ratio (2030)	Health-Adjusted Old-Age Dependency Ratio (2030)
France	32	51	38
Germany	35	62	43
Switzerland	30	53	37

Our rough health adjustment in the dependency ratio gives important insights for these three countries. Given the much slower increase in HOADR between the years 2005 and 2030-adjusted, the demographic challenge that these countries will face in the future seems much less serious than expected. Moreover, taking into consideration the decreasing birth rates, sustaining the current budget level with respect to GDP does not seem to be challenging for the next 20 years.

5.3 Strategic positioning of selected countries adding the skill dimension

In the following, we want to analyse the strategic position of selected countries when adding the skill dimension to health life expectancies. We already talked about the dimension of skill in chapter 3 and analysed the different educational levels of the selected countries. We assume that well educated people are not only healthier[70], but are also able to contribute longer to the workforce thanks to better working conditions as they often do not have to fulfil manual or physical work. In addition, well educated people are usually more used to adjust to changing work environments and are therefore more likely to grow on modernization challenges.

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68 *Eberstadt* (2011).

69 *Eberstadt* (2011).

70 Bopp (2006); Brunner (1991)

It is sure that health and skill are two crucial factors when it comes to the potential of workforce contribution. To point out the strategic position of the selected countries we brought these two dimensions together (see figure 6). Hereby, we define “health” with the healthy life expectancy without activity limitation in years and “skill” with the percentage of the population between now 55 and 64 that at least have upper secondary education.

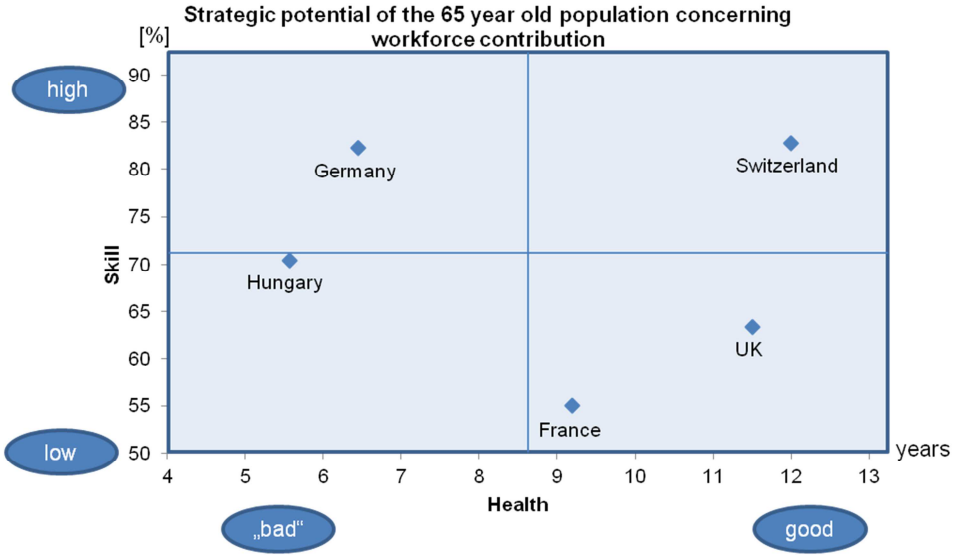

Figure 6: Strategic potential of the over 65 year old population concerning workforce contribution

Figure 6 shows on both dimension health and skill differences in the strategic position of the countries. This is also true for countries that are economically on a comparable level like Switzerland, France, Germany and the UK. This is a surprising finding since political discussions have disregarded this fact so fare and no actions to harness this potential have been taken. Switzerland has the best position among the analysed countries having a relatively good health and highly skilled population where as the UK reaches a high life expectancy but has a disadvantage when it comes to education. Germany on the other hand is in comparison weaker at the health dimension, but has a highly skilled population at the age between 55 and 64. France is in the middle regarding health but at the bottom on the skill dimension. To take the education level into account adds the idea of solidarity. The privileged in a society may be asked to take over more responsibility in order to maintain the sustainability of the social systems in the years to come. It is an area that has to be addressed by future research and a mindset change might be necessary as well.

The politician are in charge to actually harness the above mentioned potential, otherwise it will just stay a potential not helping to solve the future challenges. There could be additional training initiatives for older people or incentive programs to keep the well-educated in the working process among others. Future research has to elaborate on these findings

and support politicians to better understand this complex topic of demographic change. We also showed that the classic dependency ratios show some clear disadvantages and therefore might have to be replaced.

6 Summary

The paper analysed dependency ratios in various OECD countries in order to draw conclusions about the sustainability of social transfer systems in light of the challenges that demographic change and population ageing impose on those. Due to the projected, high increases in dependency ratios as a result of population ageing in the years until 2030, public pension, healthcare and social payments seem unsustainable. However, the analysis of various aspects such as life expectancy, healthy life expectancy and educational levels of the aged population showed that there are segments in the part of the population aged 65 years or older that could still contribute to the workforce. Especially increases in life expectancy and good health of the elderly can help mitigate the challenges faced by ageing societies. The health-adjusted old-age dependency ratio (HOADR) showed slower increases until the year 2030 than the conventional old-age dependency ratio. In the light of this outcome, a more optimistic perspective is possible on the sustainability of social transfer budgets in the next 20 years for all of the analysed countries. In addition, skills of the population are found to be another potential that society can use in order to tackle the challenges of population ageing. This is because different studies indicated that better educated people have a higher life expectancy and are likely to contribute longer to the workforce. Consequently, countries should take action in order to harness the economic potential of high health and skill levels in society. Today's elderly are more robust, more educated, and better placed for productive work in older life than ever before. If our societies choose not to make use of that potential, this will be their political decision — not some consequence of inescapable demographic realities. This is a very important finding, because it does not leave the policy makers in a powerless situation but gives them valuable opportunities for action in order to manage the demographic challenge in the years to come.

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Appendices

Appendix A: Social transfer budgets

Figure 7.1 Social transfer budgets of selected countries (Source: OECD)

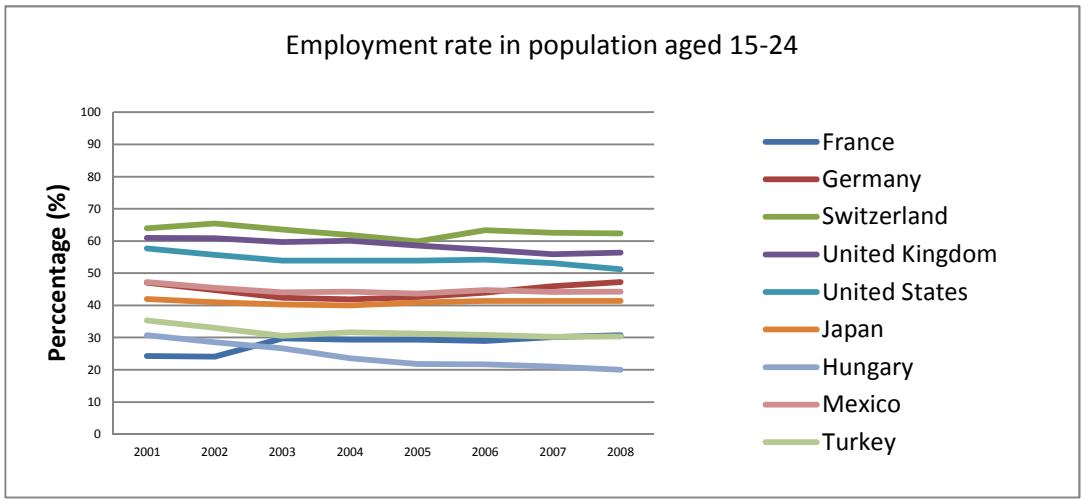
	Unit	2001	2002	2003	2004	2005	2006	2007	2008
FRANCE									
Public expenditure on health	% of GDP	8,1	8,4	8,6	8,7	8,8	8,7	8,7	..
Public social expenditure	% of GDP	..	..	29	29,1	29,2	..	..	..
Public pension expenditure	% of GDP	10,3	10,2	10,3	10,4	10,6	..	..	..
Net official development assistance (Aid)	% of GNI	0,31	0,37	0,4	0,41	0,47	0,47	0,38	0,39
Total tax revenue	% of GDP	44	43,4	43,2	43,5	43,9	44	43,5	43,1
Taxes on income and profits	% of GDP	11,2	10,4	10	10,2	10,3	10,7	10,4	10,4
Taxes on goods and services	% of GDP	11,1	11,1	11	11,1	11,1	10,8	10,7	10,5
Taxes on the average worker	% of labour cost	49,8	49,8	49,8	49,9	50	50,1	49,2	49,3
GERMANY									
Public expenditure on health	% of GDP	8,3	8,4	8,5	8,1	8,2	8,1	8	..
Public social expenditure	% of GDP	..	..	27,3	26,7	26,7	..	..	..
Public pension expenditure	% of GDP	10,6	10,9	11	11	11	..	..	..
Net official development assistance (Aid)	% of GNI	0,27	0,27	0,28	0,28	0,36	0,36	0,37	0,38
Total tax revenue	% of GDP	36,1	35,4	35,5	34,8	34,8	35,6	36,2	36,4
Taxes on income and profits	% of GDP	10,4	9,9	9,7	9,5	9,8	10,8	11,3	11,6
Taxes on goods and services	% of GDP	10,4	10,3	10,4	10,1	10,1	10,1	10,6	10,5
Taxes on the average worker	% of labour cost	53	53,5	54,2	53,2	53,1	53,3	52,6	52
JAPAN									
Public expenditure on health	% of GDP	6,5	6,5	6,6	6,6	6,7	6,6	6,6	..
Public social expenditure	% of GDP	..	..	18,1	18,2	18,6	..	..	..
Public pension expenditure	% of GDP	6,5	6,9	7,1	7,2	7,4	..	..	..
Net official development assistance (Aid)	% of GNI	0,23	0,23	0,2	0,19	0,28	0,25	0,17	0,19
Total tax revenue	% of GDP	27,3	26,2	25,7	26,3	27,4	28	28,3	..

Taxes on income and profits	% of GDP	9,1	8	7,9	8,4	9,3	9,9	10,3	9,7
Taxes on goods and services	% of GDP	5,3	5,3	5,2	5,3	5,3	5,2	5,1	5,1
Taxes on the average worker	% of labour cost	24,9	30,5	27,4	27,3	27,7	28,8	29,3	29,5
MEXICO									
Public expenditure on health	% of GDP	2,4	2,5	2,6	2,7	2,7	2,6	2,7	..
Public social expenditure	% of GDP	..	..	7,3	7,2	7,4	..	..	..
Public pension expenditure	% of GDP	0,7	0,8	1	0,9	1	..	..	..
Net official development assistance (Aid)	% of GNI	..	..	..	..	..	..	..	..
Total tax revenue	% of GDP	17,1	16,5	17,4	17,1	18,1	18,3	18	21,1
Taxes on income and profits	% of GDP	4,8	4,8	4,6	4,2	4,4	4,6	5	5,2
Taxes on goods and services	% of GDP	8,8	8,1	9,1	9,5	10,3	10,3	9,5	12,4
Taxes on the average worker	% of labour cost	13,2	15,8	16,8	15,3	14,7	15	15,9	15,1
HUNGARY									
Public expenditure on health	% of GDP	4,9	5,3	6	5,8	6	5,9	5,2	..
Public social expenditure	% of GDP	..	..	22,2	21,7	22,5	..	..	..
Public pension expenditure	% of GDP	7,2	7,8	7,7	7,8	8,3	..	..	..
Net official development assistance (Aid)	% of GNI	..	..	..	..	..	..	..	..
Total tax revenue	% of GDP	38,1	37,9	37,6	37,6	37,3	37,1	39,5	40,1
Taxes on income and profits	% of GDP	9,8	10	9,3	8,9	8,8	9,1	10	10,4
Taxes on goods and services	% of GDP	14,7	14,2	14,8	15,4	14,8	14,3	14,9	14,9
Taxes on the average worker	% of labour cost	55,8	53,7	50,8	51,8	51,1	52	54,5	54,1
TURKEY									
Public expenditure on health	% of GDP	3,8	4,1	4,3	4,3	4,1	4,1	4,1	..
Public social expenditure	% of GDP	..	..	13,5	13,6	13,7	..	..	..
Public pension expenditure	% of GDP	..	..	..	..	6,3	..	..	..
Net official development assistance (Aid)	% of GNI	..	..	..	..	..	..	..	..
Total tax revenue	% of GDP	26,1	24,6	25,9	24,1	24,3	24,5	23,7	23,5
Taxes on income and profits	% of GDP	7,5	6,1	6,1	5,3	5,3	5,3	5,6	5,7
Taxes on goods and services	% of GDP	10,5	11,5	12,8	11,5	12	11,9	11,3	10,8
Taxes on the average worker	% of labour cost	43,6	42,5	42,2	42,8	42,8	42,7	42,7	39,7

SWITZERLAND									
Public expenditure on health	% of GDP	6	6,3	6,6	6,6	6,7	6,4	6,4	..
Public social expenditure	% of GDP	..	..	20,3	20,3	20,3	..	..	..
Public pension expenditure	% of GDP	6,4	6,3	6,5	6,4	6,4	..	..	..
Net official development assistance (Aid)	% of GNI	0,34	0,33	0,37	0,4	0,43	0,39	0,38	0,42
Total tax revenue	% of GDP	29,5	29,9	29,2	28,8	29,2	29,3	28,9	29,4
Taxes on income and profits	% of GDP	12,4	12,9	12,5	12,5	13	13,4	13,2	13,9
Taxes on goods and services	% of GDP	6,8	6,8	6,8	6,8	6,9	6,8	6,5	6,5
Taxes on the average worker	% of labour cost	30,1	30,1	29,7	29,4	29,5	29,5	29,7	29,5
UNITED KINGDOM									
Public expenditure on health	% of GDP	5,8	6,1	6,2	6,6	6,7	6,9	6,9	..
Public social expenditure	% of GDP	..	..	20,5	21,1	21,3	..	..	..
Public pension expenditure	% of GDP	5,3	5,3	5,3	5,4	5,5	..	..	..
Net official development assistance (Aid)	% of GNI	0,32	0,31	0,34	0,36	0,47	0,51	0,35	0,43
Total tax revenue	% of GDP	36,1	34,6	34,3	34,9	35,8	36,6	36,1	35,7
Taxes on income and profits	% of GDP	14,3	13,2	12,6	12,8	13,7	14,5	14,3	14,2
Taxes on goods and services	% of GDP	11,3	11,2	11,2	11,1	10,8	10,6	10,5	10,3
Taxes on the average worker	% of labour cost	32,2	32,3	33,8	33,9	33,9	34	34	32,8
UNITED STATES									
Public expenditure on health	% of GDP	6,3	6,6	6,8	6,9	7	7,1	7,3	..
Public social expenditure	% of GDP	..	..	16,2	16,1	15,9	..	..	..
Public pension expenditure	% of GDP	5,2	5,3	5,3	5,3	5,3	..	..	..
Net official development assistance (Aid)	% of GNI	0,11	0,13	0,15	0,17	0,23	0,18	0,16	0,19
Total tax revenue	% of GDP	28,8	26,5	25,9	26,1	27,5	28,2	28,3	26,9
Taxes on income and profits	% of GDP	14,1	11,7	11,2	11,4	12,9	13,6	13,9	12,6
Taxes on goods and services	% of GDP	4,7	4,7	4,7	4,8	4,8	4,8	4,7	4,6
Taxes on the average worker	% of labour cost	30,3	30,1	29,9	29,8	29,7	29,9	29,7	30,1

Appendix B: Employment rates of different age groups

Figure 7.2 Employment rate of population aged 15-24



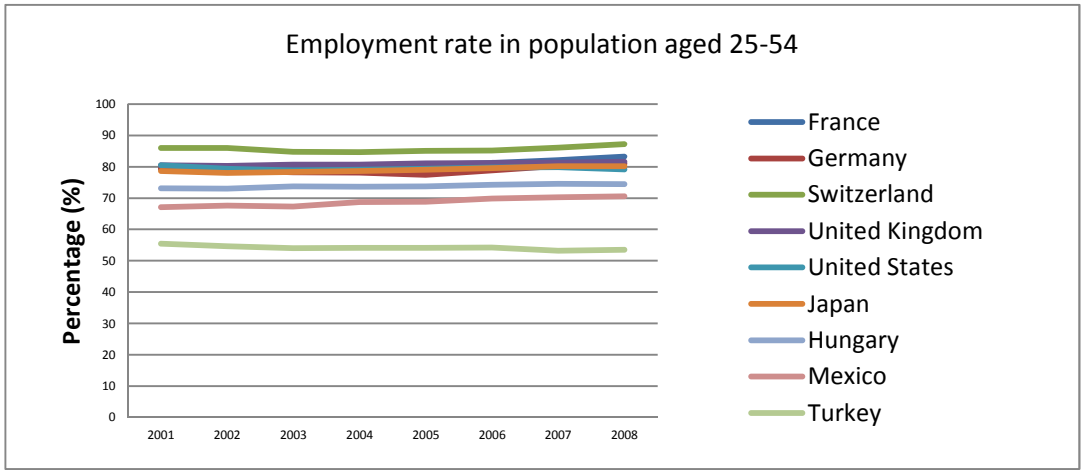
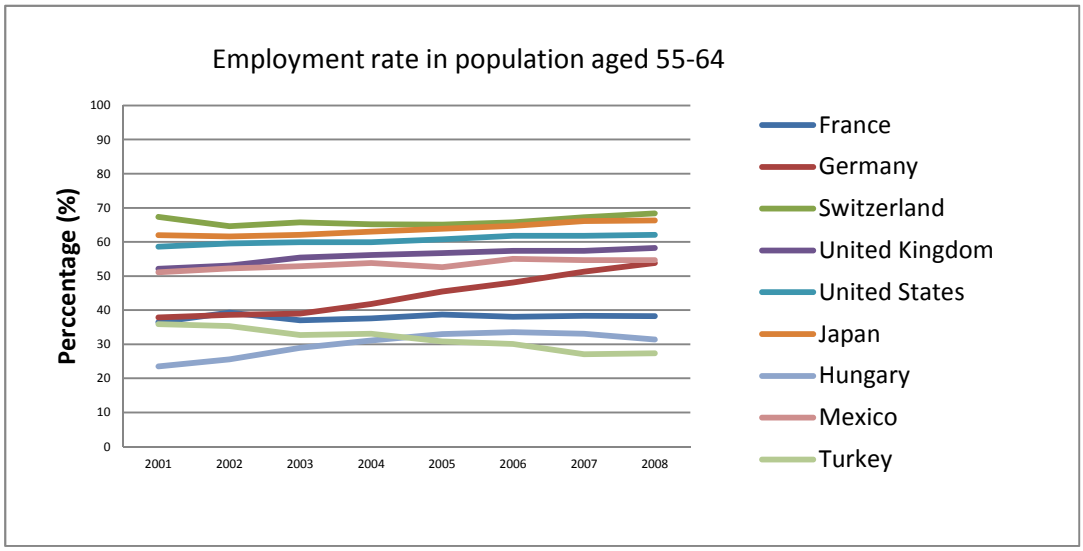


Figure 7.3 Employment rate of population aged 25-54

Figure 7.4 Employment rate of population aged 55-64


Employment rate in population aged 55-64
Perccentage (%)
100
90
80
70
60
50
40
30
20
10
0
2001
2002
2003
2004
2005
2006
2007
2008
France
Germany
Switzerland
United Kingdom
United States
Japan
Hungary
Mexico
Turkey

Universität St.Gallen

Demography meets Japan

Can a shrinking and ageing society maintain wealth and economic growth?

Marco Krättli

Gabriel Larumbe

Gregor Stadelmann

Megatrend 'Global Demographic Change': Tackling Business and Society Challenges in 2030 and Beyond

Dr. med. Hans Groth, MBA

November 2011

Executive Summary

Within sixty years, Japan managed to develop from a poor country to one of the major players in the worldwide economy. The phenomenon of demographic transition, which is the combination of falling birth rates and in particular mortality rates leading to a significant rise of the total population, is one of the main determining factors having contributed to this development. Above all, the sinking mortality rates due to better health care drove the overall life expectancy upwards. While these conditions had outstanding positive effects until the end of the 90s of the 20th century, a continuously aging population is now becoming more and more dependent of the shrinking workforce. Recent forecasts predict an increase of the so-called old-age dependency ratio of over a 100% up until 2030.

In order to be able to address these events, it is crucial to understand the reasons for the drop in fertility rates. An analysis of the Japanese culture showed that the role of women dramatically changed in the course of the 20th century, leading to drastic changes in the long-lasting Japanese family system. While the number of marriages is still a considerable driver of fertility in Japan, the impact of the growing lack of motivation of women to marry is high.

Confronted with these demographic problems, the Japanese government released a variety of plans to respond to the changes in the country. With a three-pillar program focusing on health, labor market and social security policies, combined with innovation programs, the government tries to cope with the growing ratio of elderly in its country. The authors assemble a plan of action considering four areas to address the present and future problems Japan faces in this context. First, health care policies, which consist long-term care

services, community-based support systems and vitalization of the elderly. Second, labor market policies and social security that take in account adjusted retirement age, flexible salary and pension system, as well as a good work-life balance. Third, migration policies, that enable a controlled immigration. Fourth, innovation programs investing in medical research and development, and innovative robotic technologies.

Furthermore the authors explain what other countries can learn from Japan; In particular -prevention, revitalization and community based care services. Japan is the first country to have demographic challenges of this magnitude. Other countries will follow; and they may have the chance to take advantage of the lessons learned in the Land of the Rising Sun.

Introduction

With a population of 127.5 million, the U.S. Census Bureau ranks Japan as number ten of the world most populated countries. Japan's demographic change is one of the fastest in the world, which makes its investigation interesting and crucial for other countries. In the first chapter, this paper analyses the demographic situation of Japan. It is followed by a deeper insight into Japan's culture, focusing on how the country historically dealt with demographic issues. In the third chapter, we examine Japan's current demographic policies and give further recommendations for a future plan of action. In the closing part of this paper, we discuss what other countries can learn from the Japan experience.

1. Prerequisites for the current demographic situation of Japan

This chapter gives an overview of Japan's demographic development over the past decades. It provides the data set allowing us to formulate our statements on Japan's demographic situation today and the most important challenges it might be facing in the future.

History

At the end of World War II, Japan's production concentrated on the agricultural sector. Children used to stay with their families in the countryside and were poorly educated. In terms of productivity and demographics, Japan's profile was similar to that of developing nations (McKellar / Horlacher, 2000, p. 418). Nevertheless, in the following years, the economical outline changed dramati-

cally. Besides the general recovery trend after the war, changes in the country's demographic structure largely contributed to this development.

Fertility rate

The fertility rate is a good measure to allow quick prospects on the natural growth of a country's population. As in many other countries, Japan experienced a short but intensive baby boom after World War II. For about three years (1947-1949), *the total fertility rate* (TFR) jumped up to 4.5 children per woman. Some 4.98 million Japanese were born in this time (Davitt, 2007). In the following years, the exact opposite happened. There was an unprecedented drop in the fertility rate. The TFR did not recover anymore after the quick fall to 2.04 in 1957 (see figure 1), and the situation even worsened around the time of the oil shock in 1973. Families decided or were even forced to have fewer children. Furthermore, the cost of raising a child rose continuously during the 20th century. Particularly after the time of the oil shock, the fertility decline was mainly related to the dropping marriage rates. Young people started to marry at older age or did no marry at all. Without the people even coupling, the TFR sunk further and now, in the early 21st century, the fertility rate is around 1.3 children per woman (United Nations, 2011).

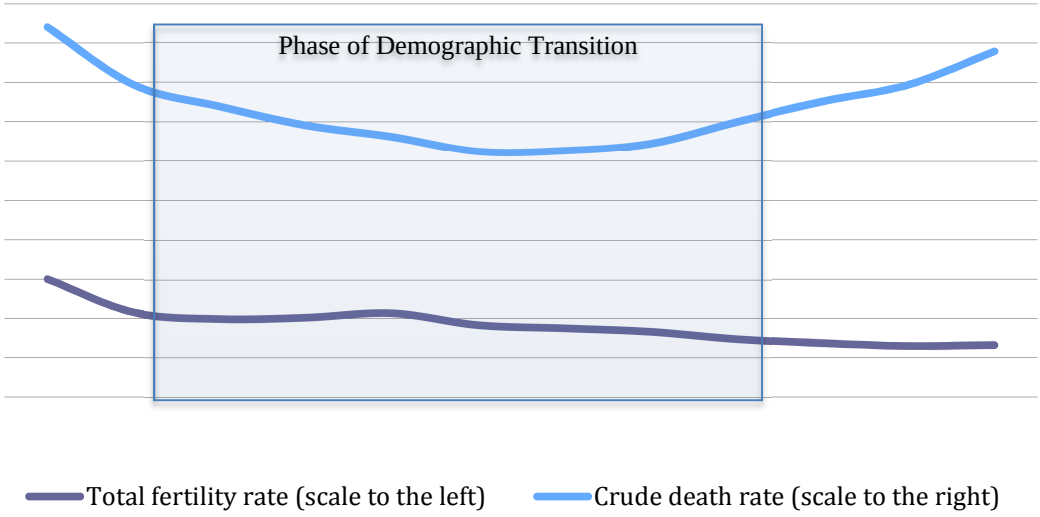


Figure 2: The demographic transition due to falling fertility and mortality rates (Source for underlying data: United Nations, www.esa.un.org, 10.01.2011, own design)

Mortality rate

Unlike the fertility rate, it is much harder to make positive interpretations of the mortality rate. There is a basic number indicating the number of deaths in a country, which is called the *crude death rate (CDR)*. It represents the "number of deaths over a given period divided by the person-years lived by the population over that period. It is expressed as number of deaths per 1,000 population" (United Nations, 2011). This indicator does not show the actual age of death of the population, and may therefore lead to misinterpretations. A country with a high CDR could still have a very aged population when for example the under-five mortality was very high as well.

Figure 1 shows that Japan's CDR curve was constantly falling until the 1980s. This can be explained by the growing-up baby boomers. Starting at around 1985, there is a sudden raise of the CDR curve, caused by the ageing gen-

eration of the baby boomers. In other words, with a declining fertility rate and the ageing of this generation, the number of deaths per 1,000 people, which is represented by the CDR curve, increases. Thus, Japan's population is now in the middle of a fast ageing process.

Demographic transition

Japan's demographic change after World War II can be summarized with the "demographic transition" phenomenon. This transition was the result of sinking fertility and mortality rates, with the latter dropping at the beginning faster than its counterpart. As a consequence, the size of Japan's population rose (Galor, 2010, p. 1 -20). The result was a growing labor force, which elevated Japan out of its demographic status as a poor country to one of the economically most powerful countries in the world.

Life expectancy

A change in the total population of a country is not only influenced by the ratio of people born versus the people who die, but also by a change in how long they live. The total population in Japan increased substantially in the 20th century, not only because of a high fertility rate after the war, but also because people started to live longer. Life expectancy went up dramatically for both sexes, from 62 years in 1950 to 82 in 2010 (United Nations, 2011). At the same time, the health care system improved and labor force moved from the agricultural sector to the service sector, which altered the overall quality of life. Increasing life expectancy has led to a growth in the number of older workers. Yet, policy changes and economic pressure resulted in diminishing labor force participation rates of the people aged 65 years and older. This can be ex-

plained by the shift from agricultural subsistence farming and small-scale marginal occupations to larger enterprises, mainly focusing on economic gains from export, or public sector employment. After the War, the majority of the workers were self-employed either in agriculture or small-scale enterprises. This means, that the decision to work was influenced by personal circumstances like wealth, health or individual preferences. Nevertheless, the demographic transition in combination with industrialization brought a change. All of a sudden, workers became employees of big private corporations or governments, with decisions now being governed by public policies[71]. (Yoon & Hendricks, 2003, p. 124-125)

Figure 2 shows the steep curves displaying both the changes in total population and life expectancy. This figure shows clearly how both graphs flatten out. The uncertainty about how future medical progress can further increase life expectancy together with a decreasing fertility rate, leads to the overall assumption that total population size will either stabilize or even shrink in the near future.

[71] Labour force participation rates among Japanese men aged fifty-five or older are expected to drop from 41% in 2000 to 29% in 2050. (Yoon & Hendricks, 2003, p. 124-125)

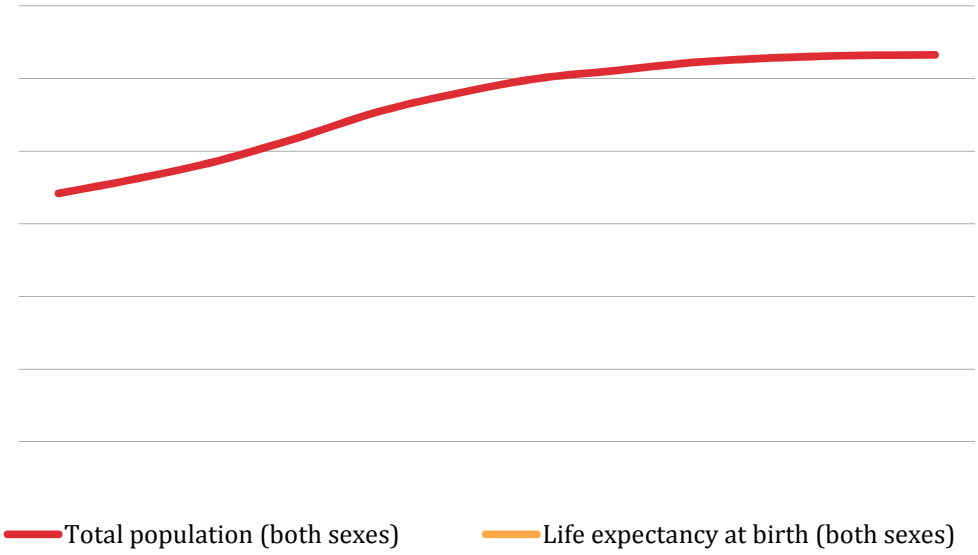


Figure 3: Japan's total population and life expectancy at birth (Source for underlying data: United Nations, www.esa.un.org, 10.01.2011, own design)

Old-age dependency ratio

The statistical term for the amount of old people dependent of the workforce is the old-age dependency ratio. It corresponds to the amount of people aged 65 or older divided by the amount of people in an employment age (15-65 years). After World War II, this ratio was below 1, mainly because of a very low life expectancy. However, as the demographic transition progressed and new technologies in medical care developed, life expectancy rose and so did the old-age dependency ratio (see figure 3).

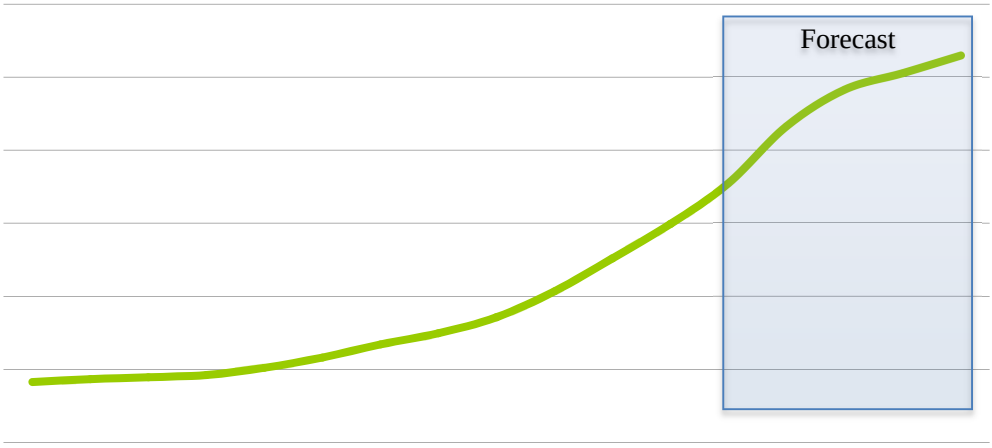


Figure 4: Japan's old-age dependency ratio, past and forecast (Source for underlying data: United Nations, www.esa.un.org, 10.01.2011, own design)

Forecasts of Japan's Demography

The previous subchapters gave an overview of the drivers that influenced the demographic change in Japan in the 20th century. Since Japan's population is only marginally influenced by migration, the currently extremely low fertility rate will most likely lead to a shrinking population size. Total population will most likely fall from 2010's approximate 128 million to a 120 million by 2030. Various sources support the forecast of a decreasing Japanese population (U.S. Census, 2011; United Nations, 2011). These forecasts are based on the assumption that the fertility rate will stay about as low as it is today.

The crude death rate (CDR) is only a rough indicator of the mortality situation in a country and is mainly affected by the age distribution within a country (CIA, 2011). Under the assumption that the fertility rate stays constant, the death rate will most likely swing up for the next 20 years (United Nations, 2011).

Rising life expectancy had some huge impacts on Japan's demographic situation in the 20th century. The forecast curves nowadays are less steep; it is assumed that life expectancy will go up to an average of 92 years by 2100 (United Nations, 2011). Compared to the average of 82 years in 2010, this is not that big of a change and therefore less significant in a 20-year outlook. The driver with the highest demographic impact is represented by the old-age dependency ratio. Recent forecasts predict a tremendous increase in the amount of elderly people in need for care over the next 20 years. By 2030, the ratio is going to be above 50%; meaning two persons in working age having to provide enough resources for one elderly person.

Figure 4 gives a comprehensive overview of Japan's demographic structure. The more the brownish rectangle on the top of the pyramid is filled, the bigger is the group, which is dependent on the working people. By 2030, Japan is going to have a large portion of its population in retirement age. This is the result of the demographic changes the country faced in the 20th century. Japan has now to develop plans to address the upcoming demographic challenges.

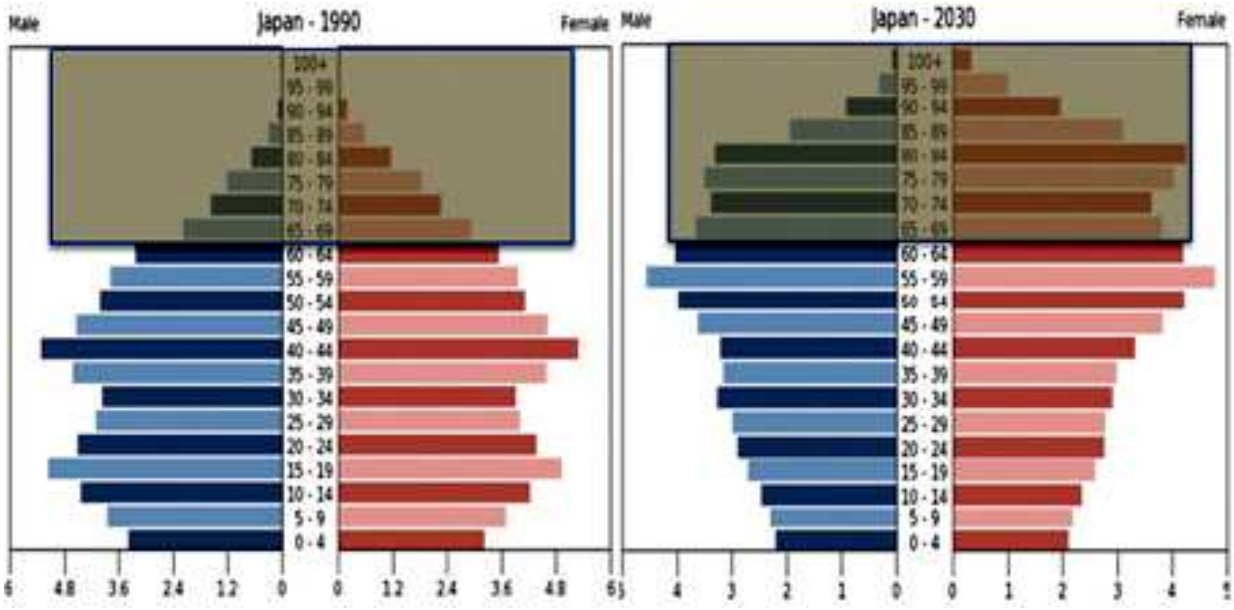


Figure 5: Comparison of Japan's population pyramid 1990 (above) and 2030 (below) (Source: U.S. Census, 2011; own additions)

In summary, over the past decades the fertility rate declined to around 1.3 children per woman. At the same time, the generation of baby boomers is now about to reach retirement age and therefore needs to rely on a proportionally weak labor force. In addition, improved quality of life and advanced health care services lead to an overall increase of life expectancy, which leads, under present retirement policies, to a growing number of retired elderly people. Uncertainties about the impact of further medical improvement together with the on-going process of decreasing fertility rate lead to assume that the size of total population will decrease in the near future. Finally, the increasing old-age dependency ratio contributes to a higher proportion of dependent elderly people. The challenge now lies in setting up appropriate measures to deal with the demographic change. To do so, it is crucial to take into account cultural aspects as discussed in the following chapter.

2. Culture of Japan

Japan is an Asian country that had to experience huge changes in the last decades. It is obvious that the changing environment has influenced society. As often seen in Asia, the Japanese society mixed its traditional habits with modern influences. Kumagai asserts that Japan brought contrasting elements of external modernity and internal tradition together in one single system (2010, p. 582). Taking a closer look at Japanese family structures and the way Japanese society dealt and deals with elderly people, it is obvious that families and their structures are a product of their society (Kumagai, 2010, p. 581). Vice versa, we can also see changes in a society by observing how families are structured and live together.

History

In the Tokugawa period (also called Edo period) from 1603 to 1868, there was no feudal family structure among the lower class, which included peasants, artisans and merchants. In the upper class however, including aristocrats, the Shogunate (the household of the Shogun, the military leader), samurai warriors and the increasing number of independent farmers, a sort of family system was established (Tanaka & Johnson, 2007). This system was called "*ie"*, and could be described as a patri-lineal, patri-local stem family (Raikhola & Kuroki, p. 51). However, due to the generally low life expectancy, the situation of elderly people in society was totally different than today. Concerning the living circumstances, there were less old people and obviously the burden of taking care of old people was less heavy. Kito (quoted in Tanaka, 2007, p. 11) said that children only needed to take care of their parents for about three years

after their retirement. Kasuagai (quoted in Tanaka, 2007, p. 12) added that in the Edo area care was highly esteemed by the public as it represented the Confucian precept of filial piety. Furthermore, caring for the parents was also linked together with the men's responsibility as the head of the household.

In the Meiji period (1868-1912), the government tried to implement the system of *"ie"*. Such a system relieved the men of their familial duties and enabled them to work in the machinery and metal manufacturing industries, which was only possible under the condition that their duties were shifted to women (Tanaka, p. 15). This was in the government's best interest to establish a capitalistic and nationalistic mind-set. The ideological basis for those changes was again the Confucian teaching of filial piety, which was also promoted in school to enforce loyalty towards both the parents and the government.

Developing changes in family structures and marriage

This system went along while gradually improving living standards, medical technology and sanitary conditions, thus leading to increased life expectancy. The demographics of Japan then evolved from a stage of high mortality and high fertility to a stage of low mortality and fertility. Still, the dependent elderly expected to be in the care of their eldest son's family (amaeru) and under the hands-on assistance by his wife (the daughter-in-law) (Tanaka, p. 15). After World War II, Japan was influenced directly by the United States of America and by the Western society as a whole. As a result, the Japanese society started to adopt western values. One of these values, which had far-reaching consequences, was that women now claimed their equal rights in inheritance, education and employment.

The change in how women lived their life is one of the reasons for the gradually lower fertility rate. Women started to postpone their marriages, or did not marry at all. A declining number of marriages were the result of these developments. Ogawa (quoted in Raikhola & Kuroki, 2009) saw several reasons for this trend. First of all, women had a better education, especially tertiary education. The second reason is that an increased proportion of women started to work out of home; they had no financial need to marry anymore. The third reason was a huge decline of arranged marriages, and fourth, young couples did not want to live with their parents without having married. Furthermore, young people did not need to get married just for sexual reasons anymore. Atho (2008, p. 20) sees one more factor for the declining willingness of women to marry: It is common in Japan, that even if they work, women have to burden the family work alone. Nevertheless, the traditional family role starts to blur, supported by the high demand for female workers due to a shift form an industrial economy to a more and more service-focused economy. For women it has become now very easy to avoid housekeeping, child raising and taking care of elderly by just not getting married.

Also, the importance of ideological, Confucian-inspired family values, decreased. Ogawa made a research about how women depend on their children for old-age security. In 1950, two-third of all women expressed the expectation that their children would provide care. Fifty years later, only 10.9 percent of all women did so. The incentive for women to have children has declined. Even if they have children, women now don’t necessarily expect any care provided by their children. The old pension schemes made it unnecessary to have children. All these factors created a downturn effect, which resulted in

fewer marriages. A conceivable argument, that there is not necessarily a link between marriage and children, has been disproved for Japan: Atoh (2008, p. 16) asserts that the prevalence rates of cohabitation and extra-marital births increased only modestly, while the proportion of never-married people of reproductive age increased dramatically.

The consequences of these trends had a tremendous effect on society. More and more old people have no children, or their children have no capacity or willingness to care for their parents or parents-in-law. This results in declining family care and support for the elderly, which represents one of the major demographic issues of the Japanese super-aged society (Raikhola & Kuroki, p. 56).

The considerable increase in both celibate childless people and childless couples has the consequence that in the future much more people will not have the emotional satisfaction given by families, and on the other side, that more elderly people will not have the chance to enjoy physical care given by family members (Atoh, p. 24). This can be shown by the familial support ratio. This ratio is defined trough the division of the female population aged 40 – 59 years through the population of both sexes aged 65 – 84 years. This index decreased from around a 1.8 ratio in 1950 to a 0.91 ratio in 2001 (Ogawa, Kondo, & Matsukura, p. 213).

The impact of the Japanese culture on the Japanese care system

In other countries, a change like the lack of motivation of women to marry would not have had that much of an impact. However, in Japan this change had a severe influence on demographics. The explanation why the impact was so big in Japan is easy and closely linked with the history and culture of

Japan. The government had mainly focused on his industrial and economic growth before, so there was little room for the development of social policies (Makita, p. 78). This resulted in a low-performing welfare state, which was only possible because the government was able to rely heavily on the private sector with families, communities or even companies for care services. The basis to do so was the above mentioned "*ie*" ideology, a patriarchal system embedded in society which relies on the role of family, gender relations and a hard-working corporate culture. According to this ideology, the family, namely the eldest son and his wife, take care of the elderly family members. So the easiest way for the Japanese government was to just maintain and support this ideology in order to save money.

This approach caused some severe problems; Ogawa explains that the accelerating demand for elder care was underestimated by the state. The result was that seriously ill older people were not able to enter residential accommodation (Ogawa, p. 145).

Due to changed cultural and economic circumstances the whole patriarchal system started to break down. Women have nowadays the choice between a high variety of paths of life and can decide on their own if they want to take care of their parents or parents-in-law. Furthermore, the sharp declining supply of informal care clashed with a massive growing demand for care services. To make things worse, the state relied on the informal sector and neglected the signs of a changing culture and economic circumstances. However, at the end of the day, Japan must find a solution to overcome these problems; the question, whether and how old cultural aspects can be transferred to a new care system for the ageing Japanese society, is of utmost interest.

In the following chapter, Japan's current policies to deal with demographic issues are going to be examined. Thereafter, the authors try to conclude with a plan of action allowing to successfully deal with the current problems.

3. Analysis of Japan's demographic policies

Japan is approaching the time when its population will start to decline. The increasing old-age dependency ratio, the rapid ageing of the population altogether with the pace of social change and the intersection of traditional ideas with international economic currents require a number of carefully planned policies to deal with the upcoming issues. It is now crucial to maintain a sustainable economic environment as well as a healthy social development (Yoon & Hendricks, 2003, p. 115; MHLW, 2005, p. 45).

3.1 Health Policies

Japan's health insurance program of today is employment-based, with governmental subsidization for the poor, disabled, and elderly. First, public sector employees are covered with health insurance by national governments as well as employers financed by taxes and receipts from public enterprises. Second, government mandated employment-based health insurance covers private employees in the formal sector[72]. Third, self-employees, agricultural workers, and workers in small enterprises are part of a public health umbrella through government regulated insurance groups financed by means of a combination of taxes and premiums (Yoon & Hendricks, 2003, p. 123-124).

This system achieves universal coverage but it causes a high level of expend-

[72] Formal sector describes the "sector which encompasses all jobs with normal hours and regular wages, and are recognized as income sources on which income taxes must be paid. Opposite of informal sector" (businessdictionary.com).

itures. Governmental stipulations, like for example price control, try to restrain those health expenditures by regulatory controls. However, these employment-based systems remain expensive (Yoon & Hendricks, 2003, p. 124).

Between 1960 and 1997, Japan's health care expenditures rose more than 100% in a percentage of the Gross domestic product (GDP). Increasing disability rates caused by a growing number of people that live long enough to reach old age and new inventive but also expensive technologies that bring new health care services were among the two main factors that caused such an increase in health care costs. In addition, the surge of rising expectations for health and life quality issues led to an increased resource allocation in the health care sector. To deal with both, the rising cost and an increasing number of care recipients, a restructuring of the health care system is needed. In particular, long-term policies become more conspicuous as survival cures deliver more elderly in need of health care (Yoon & Hendricks, 2003, p. 121).

The New Gold Plan, the role of family, and the need for long-term care service

In 1989, the Japanese government released the New Gold Plan, a ten-year strategy to promote health care and welfare for the elderly. While working on a plan of action, Japan recognized the importance of family care. In 2001, the government handed out payments to those families that provided care (silver services) to the neediest older relatives. As Tsuno and Homma (2009, p.10) asserted, 85% of family members providing support are women. There are two contrasting positions discussing the future role of family for the elderly. First, it is possible that the social change currently taking place in Japan as well as in many other Asian countries undermines the widespread support provided by families to the elderly. Second, since the Japanese society is

starting from an inherently different cultural, social, structural and economic basis than the developed countries of the West, it is not likely to resemble the Western model soon. Later, the role of family responsibility for support and care will remain a dominant factor even in future systems (Tsuno & Homma, 2009, p. 13). Nevertheless, the advanced ageing of the population, the shrinking population size of the younger generations, and at the same time the increasing female labor market participation and the declining obligation for daughters and daughters-in-law to provide care have intensified the need for long-term care service for the elderly (Tsuno & Homma, 2009, p. 6-11; Campbell & Ikegami, 2003, p. 22).

Gold Plan 21 and community-based support system

As a further action to the New Gold Plan, the Gold Plan 21, was released in 2001. The four basic directions of this plan of action are as follows: Through an improvement of the image of the elderly, senior citizens should get the possibility to manage their daily life in good health and a positive attitude. With the Gold Plan 21, a new long-term care insurance system was released, which provides nursing care for the aged person both at home and in institutions. This program was expected to ease the financial burden on the health insurance by shifting many impatient elderly away from hospital towards nursing beds. All benefits received by the people are in the form of services, not cash. This program is financed half by premiums paid by people older than 40 years and the other half by the government. Overall, this system seems to contribute to the expansion of care services in Japan. The number of hospitalizations was reduced with a significant decrease in the number of geriatric beds covered by health insurance. Families who received those care services

reported that their physical burden was reduced compared to the previous situation. Therefore, Tsuno and Homma (2009, p. 11) concluded that it is even possible to raise social charges if this goes with an increase in the services for which a latent demand is strong. Community-based care shall thereby be the basic form of living for the elderly. The Gold Plan 21 shows that Japan is engaged in developing local communities where residents can support each other (Tsuno & Homma, 2009, p. 7; MHLW, 2011a). Additionally, long-term care insurance should target the enhancement of self-reliance of the elderly by encouraging and training them to be active in self-care such as house cleaning and preparing meals. Therefore, this new insurance focuses on the more fundamental shift from service to self-help for at least those who can manage their daily tasks (Tsuno & Homma, 2009, p. 10-11, Campbell & Ikegami, 2003, p. 22).

Arising issues with long-term care insurance

However, several issues arose during the introduction of the long-term care insurance. First, whenever a plan of service was set up, a co-payment of 10% applied for the care recipient, which discouraged the elderly poor from using the available services, although a cap applies. Second, the relative prices between institutional care and home care haven't been changed in a way to shift demand more towards home care service (Tsuno & Homma, 2009, p. 10-11, Campbell & Ikegami, 2003, p. 22).

New policy initiatives for social development took advantage of the fast development of information and communication technologies. Despite low penetration rates, mobile communication technologies bring many advantages for the elderly population. Monitoring, surveillance and online-real time contacting are

some of the beneficial features. Another example is e-health, which includes electronic devices which transfer medical information and advice through broadband network. The open attitude towards information and communication technologies of senior adults in Japan supports this new field of opportunities (Lai, 2008, p. 235-245).

Although technological improvement often decreases the costs of existing services, it also brings a wide range of inventive, expensive new services. Therefore expectations and standards rise, which may lead to an overall increase of health care costs in the future (Yoon & Hendricks, 2003, p. 122).

In summary, long-term care should be conceived more broadly and include a full range of social services, health as well as personal care provided at home, in community, and in institutions. One particular challenge which governments face when it comes to the implementation of those policies is to balance health care demands against other pressing public programs. Another challenge is the prioritization between health care plans considering the elderly and other continuing demands for health care services especially for children, women in reproductive age, the poor, and those having communicable diseases such as HIV. In other words, Japan is facing decisions about what health care to provide, to whom, and how to allocate it to treat the greatest possible number of people (Yoon & Hendricks, 2003, p. 122-123).

3.2 Labor market policy and social security

In the early stage of an ageing population, a shrinking percentage of dependent children can be observed, while the labor force continues to swell. This fosters savings and investment rates. However, Japan’s economy matured earlier than elsewhere and therefore it is currently experiencing liquidity con-

cerns. Savings and investments have both decreased, thus contributing to slower economic expansion and unstable public and private revenue streams (Yoon & Hendricks, 2003, p. 129).

Japan's pension system

Japan's pension system provides a universal coverage of the Japanese population by a social insurance pay-as-you-go scheme. It is also called a three-tier system since it includes a basic pension, an income-related public pension for employees, and a corporate pension (MHLW, 2011b). The extensive old-age support is provided via payroll taxes. In other words, benefits for retirees are a pass-through from current payroll taxes. Therefore, as the number of retirees rises relatively to the number of workers, a combination of higher taxes and reduced benefits will be required (Yoon & Hendricks, 2003, p. 128).

Retirement age

The labor market structure today discourages or sometimes even prohibits elderly employees to continue working. However, sometimes it is also simply the employees' preference to stop working since modern fiscal markets as well as public and private pension policies facilitate the accumulation of personal resources that makes an early retirement possible. As a consequence, mid- to late-life unemployment rates are likely to escalate (Yoon & Hendricks, 2003, p. 124).

Nevertheless, in times of improvements in health and life expectancy there is an imperative for the government to adjust mandatory retirement ages upwards, thus enabling people to continue to be economically engaged. In fact, there is little reason for governments to encourage early retirement. This

would only reduce employment rates and incomes, reduce national economic well-being, and suppress the tax base (Yoon & Hendricks, 2003, p. 126).

As a matter of fact, there has been a gradual increase in the retirement age from 60 to 65 years. Therefore, the government of Japan encourages employers to hire more senior people (Tsuno & Homma, 2009, p. 7). In terms of job opportunities for the younger, in a well functioning economy the fact of enlarging the elderly workforce doesn't endanger the employment of the younger. Older and younger workers have different skills and the number of jobs flows in dynamic fashion with the number of persons participating in the labor market (Yoon & Hendricks, 2003, p. 126).

Flexible salary system

Regardless of the retirement age, wage systems have to be adapted as well. Currently, salaries of some older workers are clearly out of proportion to what they contribute to the bottom line. Therefore, wages should be tied more closely to job performance to make it financially possible for companies to keep elderly employees. Other aspects are work hour flexibility, which make it possible for workers to slide over to part-time employment before getting retired, and more flexible job assignments (Yoon & Hendricks, 2003, p. 126).

Flexible pension plans

Another option to ease the burden of a large proportion of early retirees consists in linking pension benefits to the retirement age. Therefore, pension pays might be higher for a person that retires at a higher age than for a person that retires earlier. To help senior employees to cope with technological changes, occupational retraining programs and general educational upgrading can al-

low to stay longer in the jobs, or to take up new occupations (Yoon & Hendricks, 2003, p. 124-127).

Work-life balance

The rapid decline in the labor force is the direct result of a declining fertility rate. Several investigations of the workforce pointed out that Japan's employees are often too stressed out or are having too little time to take care after of a family. Japan therefore tries to achieve a better work-life balance to make it friendlier for a family life with children. The government developed a strategy to break the situation forcing people to choose between work and marriage, respectively children. This particularly means changing the work style of parenting workers, establishing work styles allowing fathers to participate in child care, assisting workers in balancing work and family care and ensuring general effectiveness which means establishing a system to publish the names of violators of child care and family care leave law (MHLW, 2011c). A better work-life balance may not only positively influence the fertility rate; it also increases job satisfaction and performance.

Migration Policy

The shrinkage of the work force, caused by a low birth rate and an increase in the number of elderly, made foreign workers indispensable. With The Basic Plan for Immigration Control of 2000, Japan made evident its movement towards inclusion. It planned to offer long-term resident status to highly skilled engineers and international students who found employment in Japan. In addition, it made it easier for existing long-term residents to become permanent residents. However, it kept stressing the prohibition of unskilled foreign labor-

ers. The surge of terrorism at the beginning of the 21st century exacerbated the immigration control procedure. Those new assertions of exclusions matched well with the old discourse of mono-ethnicity, which is still dominating in the minds of certain politicians. These wish to cope with labor shortage through the deployment of women and the elderly rather than through the inclusion of foreigners. In 2005, when the population shrank for the first time in the post-war period, admission policies, all written down in The 2005 Basic Plan, became less restrictive. There are several reasons in favor of an open immigration policy of Japan. First, the resources of women and elderly will not be able to replace the massive labor shortage any longer. Second, in order to secure high-quality human resources, international recruitment patterns in the global economy became a necessity. Third, integration policies and the promotion of education of children of foreign workers are crucial in terms of prevention of violent clashes between different ethnics and cultures (Tai, 2009, p. 322-338). In The 2005 Basic Plan, the government for the first time discussed the importance of providing a confortable life environment for long-term foreigners and even articulated the possibility of admission of medium skilled workers. In brief, Japan's immigration policies started to present a view of Japan as a multicultural nation (Tai, 2009, p. 322-338).

In summary, labor policies should consider the following major issues: The institutional framework should give elderly employees the opportunity to stay in their job as long as their physical and mental performance allows. Additionally, professional and private life should be balanced by taking into consideration traditional work patterns. This may not only help to increase birth rates, it also motivates more people to participate in work life and increases labor par-

ticipation and productivity. In order to fully utilize the workers' abilities, proper performance evaluations are needed. According to the information gathered, human resources can be developed based on opportunities given for self-development and by establishing multifaceted education and training programs (MHLW, 2005, p. 45-47). Finally, in order to maintain a sufficient labor force with high skilled employees, open migration policies are needed. It will have to be kept in mind that, in Japan, religion and ideologies have historically played a dominant role in shaping ethical prescriptions and, thereby, public pronouncements. Particularly Confucianism plays an important role in influencing idealized views of elderly (Yoon & Hendricks, 2003, p. 131).

3.3 Innovation Programs

Japan is strengthening advanced medical research on diseases affecting the elderly and additionally promotes preventive medicine. Although the main initiatives in medical technologies came from private companies, in 2008 the Council of Science and Technology Policy (CSTP) announced a 5-year roadmap to accelerate the translation of research and development results into society. Additionally, it is pushing innovative technological development of the industrial sector. With robotic technologies for example, manpower might be substituted or complemented in the future. To foster innovation and therefore support productivity, Japan launched "Innovation 25" in May 2007. This was Japan's first long-term policy roadmap that calls for better working opportunities for women and the elderly and for an improvement in productivity over the next two decades. The "Innovation 25" report stipulates the core activities such as development of inter-disciplinary technologies, collaboration between universities, or deregulation reforms. Many technologies are still in the early

stage of development; however, they might become crucial for the Japanese economy and for other ageing societies in the near future (Tsuno & Homma, 2009, p. 7-12).

4. Suggested plan of action

As a result of the analyses in the previous chapters, we propose the following points as recommendations to relieve the impact of the demographic change in Japan:

1.) Health Policies

- Long-term care services at home and in institutions become a necessity since the traditional role of families is changing.
- Community-based support systems help to reduce the deficiency of medical insurances and the lack of human resources, since residents of local communities can support each other. Additionally, they increase life quality of all parties involved in the care service.
- Vitalization of elderly helps senior citizens to manage their daily life independently. New information and technological innovations can support this trend.

2.) Labor market policies and social security

- With steadily increasing life expectations and improved health conditions, retirement ages must be adjusted.
- Salary systems have to be flexibly linked to job performance.
- Pension benefits should be dependent of the age of retirement.
- Good work-life balance needs to be supported, thus increasing job satisfaction, job performance and possibly the fertility rate.

3.) Migration Policy

- An open but controlled immigration policy helps to alleviate labor shortage, to secure high-quality human resources and helps to prevent cultural and ethnical clashes.

4.) Innovation Programs

- Investing in medical research and development helps to better deal with health issues, among others of elderly people.
- Innovation in robotic technologies may replace the lack of manpower in the future.

5. What can other countries learn from Japan

Japan undergoes one of the most radical demographic changes in the world. The experience and information gained in this process may provide valuable information for other countries (Matsukura, Ogawa, & Clark, 2007, p. 151).

Taking a closer look at the plans and intentions of Japan to overcome the demographic challenge shows a strategic approach which may be interesting for other countries as well.

Japan's strategic approach is based on three main drivers. The first driver is prevention, which plays an important role to keep elderly people as long as possible healthy and independent. The second driver is revitalization: Japan has to deal with an aging work force and needs to find solutions to keep labor resources as long as possible in the job and to improve the respect of younger people towards the elderly. The last driver is the impact of the communities: This cultural aspect was seen as a bottleneck for a long time. On the one hand, women emancipated and traditional customs changed. This cultural change caused a lower family care service supply. Yet, more and more elderly people are in need of such services. Nevertheless, the responsibility for taking care of the elderly is firmly established in the Japanese culture and provides a deep intergenerational solidarity within a community. As a matter of fact, this cultural aspects help to reduce care cost by allowing to actively creating community based support systems.

This strategic approach clearly focuses on revitalization rather than simply building up expensive infrastructure to push off the elderly. Therefore, the main idea is to keep elderly people active, integrated into the system, and independent as long as possible.

It should be noted that, even if this can be seen as a model for other countries as well, Japan’s cultural aspects act as a driver since responsibility towards elderly has always been an integral part of the society. What can be learnt for any country is that high system flexibility is a necessity to effectively establish new strategies to deal with demographic challenges.

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Demography Meets Emerging Markets:
China vs. India who will win the race?

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Megatrend 'Global Demographic Change': Tackling

Business and Society Challenges in 2030 and Beyond

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Executive Summary

China and India represent the two most populous nations in the world. Both countries had a political fresh start in the early 1950's with similar demographic structures, but totally different political systems, which led them down different development trajectories. China, after 30 years of rapid economic growth due to its capturing the potential of its demographic dividend and reforming its economic policies, is now facing a huge challenge of maintaining sustainable growth due to its diminishing demographic dividend. Meanwhile India will have the opportunity to take advantage of its demographic dividend in 2025 when the workforce reaches 1 billion people. This however depends on whether or not it will be able to educate this workforce and employ it productively. The rise of both countries will have a profound effect on the rest of the world, as both of them become increasingly integrated into global policy making and the sheer size of their economies allows them to intervene into foreign markets.

Demographic change in both countries opens up new business potential to investors. India is in a position to take over low-value-added manufacturing which China has decided to move away from. This however will require massive investments into its infrastructure which again represents a huge investment opportunity. As the energy needs of both countries continue to rise, they are increasingly looking towards renewable energies to sustain their growth. As such renewable energy and other high technologies providers are set to benefit from the growth of both countries.

As to the question of which country will win the race to becoming a developed country, it is clear that China will achieve this status first. However the question of who will win the race is more than just an economic one; it is also a question of which country will succeed in bringing prosperity to all of its citizens in a fair and sustainable way. In this respects both countries have some way to go.

Table of Contents

Introduction

China and India are the two most populous nations in the world and are driving global economic growth at fast rates. However their populations are set to expand and only a small portion of their economic potential has been tapped so far. In this paper we analyze how their future growth is set to impact not only their own economies but those of the entire world. The objective of this paper is to answer the question of which nation will win the race to becoming a developed country. In order to achieve this we first analyze past and expected future demographic developments for both countries, as well as conduct a PESTLE analysis to establish their comparative opportunities and challenges. We then examine how the two countries will impact the global order in the near future. Subsequently we formulate policy recommendations through which both countries will be able to achieve their ambitious growth goals and finish with an appraisal of investment opportunities in both countries.

1 Demography of China

1.1 History and Drivers of Demographic Development in China

By the time China held its first modern population census in 1953 it boasted a population of just under 600 million people, which at the time accounted for around 23.5% of the world population. Between 1950-1970 the population grew at its most rapid due to a high total fertility rate (TFR) of 5.8, which together with a sharp decline in infant mortality rates from 203 per 1000 births in 1949 to 34.7 in 1982 contributed towards an average annual population growth rate of over 2% between 1950-1970. The crude death rate also declined markedly from around 25 per 1000 in the early 1950's to around 7 in 1970 (The World Bank, 2011).

The declines in both the infant mortality rate during this period and the crude death rate can be seen as "a result of economic development and improvements in education and health services, especially the public hygiene movement that resulted in a sharp drop in mortality from infectious diseases (6)." (Xizhe, 2011).

The next major shift in China's demographic development came in the form of a nationwide fertility transition, due to the increased availability of contraceptive methods and the introduction of China's family planning program in the early 1970's, which had no numerical targets but instead emphasized later marriage and childbearing, as well as longer intervals between births. The famous one-child-policy only came into effect in the late 1970's after the largest decline in the TFR had taken place and contrary to popular belief did not apply universally in China, with couples living in rural areas permitted to have two children and ethnic minorities more still. As a consequence of these programs the TFR fell from 5.8 in 1970 to 2.8 in 1979 (introduction of the one-child-policy) and kept on dropping until it fell below replacement fertil-

ity levels of 2.1 in 1990 and now currently lies at around 1.5 (Xizhe, 2011). Life expectancy has also almost doubled from 40 years in the early 1950's to around 73 years today (Xizhe, 2011). However a negative side effect of the one-child-policy that must be mentioned is a gender-mismatch in the population. This mismatch has increased from 104.88 males to every 100 females born in 1953 to 118.06 males born for every 100 females in 2010 (Xizhe, 2011). This worrying trend is due to sex-selective abortions which, although illegal, are evidently still a common practice.

In 1953 China had a high dependency ratio of 67.8 as 36% of the Chinese population was under 14 years of age and 4.4% of the population was over the age of 65. This constellation remained more or less stable until the 1980's. Since then the proportion of the population aged from 0 to 14 years has shrunk to merely 16.6% today and the proportion of people aged 65 or over has increased to 8.9%. This aging in the population is due to the decrease in the TFR and mortality rates and an increase in life expectancy. This aging, which will pose challenges in the future, has however contributed towards China's rapid economic development since the economic reforms in the 1980's and has resulted in a working population of 74.5% of total population today (China Statistic Bureau, 2008). This huge working population is referred to as China's demographic dividend. It has bolstered China's economic development and has led to increased urbanization rates of around 50% today compared to 13% in the 1950's, with over 15 million people a year migrating from rural areas into the country's 655 cities between 2000-2010. This mass migration is due to a shift of employment away from the agricultural sector towards industrial and services sectors which are typically located in urban areas (Xizhe, 2011).

1.2 China's Demographic Future

Although China's TFR lies beneath replacement levels, its population is expected to grow over the next decade. There is no consensus among a myriad of organizations both within and outside of China, as to when and at what level the size of the population will peak. According to Xizhe (2010), many organizations expect a stabilization of the population by 2030 at levels ranging from 1.35 billion to 1.5 billion assuming a static policy environment. After this point a sharp decline in the population size to levels between 1.18 and 1.3 billion people in 2050 is forecasted. However if we assume various changes to the current family planning policy, we end up with variations both in the time at which population stabilization is expected to be achieved (between the years 2025 and 2035) and the size of the population at stabilization (between 1.4 and 1.5 billion people). Ultimately however the population is expected to drop back to 1.3 and 1.5 billion around 2050 (Xizhe, 2011).

The age structure of the population at these points in time however also carries a great significance, as the proportion of the population aged 65 years or over is expected to increase from just under 10% today to around 20% in 2030 and then to around 30% in 2050 com-

pared to a world average of 21.9% (Asian Development Bank, 2011). During this time the share of total population expected to be taken up by people aged 0-14 years is expected to remain more or less constant at values between 11-16%. This aging of the population has fueled expectations, that China's demographic dividend will decline beyond 2015 as the working-age population peaks, labor shortages start to build up (Asian Development Bank, 2011) and the economic support ratio declines, as each new generation will be 25% smaller than the one that preceded it (Wang, 2010).

1.3 Opportunities and Challenges for China: PESTLE Analysis

Political

The People's Republic of China (PRC) is a single-party communist state with a mixed economic system. The Chinese Communist Party (CCP) is the founding and ruling political party of the PRC and is guaranteed absolute power by the constitution (CountryWatch Incorporated, 2011). Although the population does not enjoy the privilege of participating in direct elections, they can vote for low level local deputies and deputies in self-governed areas (China Internet Information System, 2011). Despite a lack of direct participation in the governance of their nation, satisfaction levels of 87% among the population in regard to its country's development and management by its government are among the highest in the world according to a national survey conducted in 2010 by the Pew Research Center's Global Attitudes Project. The same survey also gaged the populations' sentiment in respect to the country's expected progress over the next five years. A total of 74% of respondents felt optimistic about China's future development (Pew Research Center, 2011).

As a result Country Watch has assigned the PRC a relatively high political stability score of 8 out of 10 in its Political Stability Index[1] despite occasional uprisings and terrorist activities in selected provinces such as Tibet (CountryWatch Incorporated, 2011).

Indeed China's rapid growth is due to a policy environment conducive to economic development, starting with China's opening up in the 1980's and culminating in its efforts to join the World Trade Organization. Its efforts to streamline administrative processes to combat bureaucratic inefficiencies, as well as numerous campaigns to curb corruption among government officials are aimed at prolonging its economic boom (CountryWatch Incorporated, 2010)

As the CCP is not subject to public review and as such does not depend on populist policies to secure its ruling position, it is able to push through new policies and programs, however unpopular, which are necessary to secure the country's ongoing development. This does however raise concerns over basic human rights violations which are commonplace in China.

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[1] This index measures the dynamic between the quality of a country's government and the threats that can compromise and undermine stability. It is based on a given country's record of peaceful transitions of power, ability of a government to stay in office and carry out its policies vis-a-vis risk credible risks of government collapse.

Economic

China has experienced a dramatic six-fold increase in GDP over the past decade, rising from the sixth to the second largest economy in the world with a GDP of US$ 5.74 trillion in 2010 (Nin-Hai, 2011). This accounted for 9% of nominal global GDP in 2010 (Standard Chartered Bank, 2010). In 2010 agriculture made up for 10.2%, manufacturing industries 46.9% and service industries 43.1%.of GDP, whereby agriculture employed 38.1% of the labor force and industry and services employed 27.8% and 34.1% respectively (CIA, 2011). China is the world's largest exporter of goods overall and is responsible for more than one-tenth of global medium- and high-technology manufactured goods exports. It is the world's second-largest importer, and consumes around one tenth of global commodities (Bureau, 2010), while having the world's largest foreign exchange reserves. Inflows of foreign direct investment (FDI) to China accounted for 7% of gross world FDI inflows or US$ 105.7 billion in 2010 (Bloomberg News, 2011).

China has relatively low unemployment rates of 4.3% in 2009, but high inflation rates of close to 6% on average in 2011 (Statista, 2011). At the same time real hourly wages have increase at an average of 13% over the last ten years. Despite rising labor costs labor demand has not dropped and labor shortages already exist as the number of migrant workers is shrinking and young people entering the workforce have high expectations regarding employment. This is in part due to Chinas one-child policy and the "little emperor syndrome" that accompanies it. Already around 30% of China's 6 million annual college graduates can't find jobs outside of factories and farms (Ryder, 2010).

However as China aims to move away from low-value- added manufacturing towards more technology and innovation driven industries and services, this large number of educated young people could prove to be of high value. In this respect China is doing a very good job with free 9 year compulsory education reaching virtually all children, literacy rates up to 93.98% in 2008 (compared to 65.51% in 1982) and government education spending increasing from 2.79% of GDP in 2004 to 3.33% in 2008. (China Daily, 2010)

Societal

As already mentioned above, China's population is aging rapidly. One of the main problems accompanying the aging itself, is the low level of per capita income at which it is occurring. China's per capita income currently lies at just over US$ 4000 per year, which is much lower than levels in developed countries when they had the same percentage of people at retirement age (Japan $14'900 and USA $15'500) (Nin-Hai, 2011). This "Aging before affluence" problem is exacerbated by a lack of social security mechanisms (Asian Development Bank, 2011). Currently only 15% of the working-age population are covered by any sort of social security net, with most beneficiaries in urban areas (Asian Development Outlook, 2011). This weak social safety net on the other hand has encouraged a high savings rate of 29% of GDP

in 2009 among all age groups. As a result investment rates are very low at 35% of GDP (Prasad, Liu, & Chamon, 2011). Due to this savings-investment-imbalance Chinas economy is very susceptible to external demand shocks.

As already mentioned above, China is currently faced with a significant mismatch in the numbers of male and female births. On average 18% more boys are borne than girls every year, with that number being higher in selected rural provinces (Xizhe, 2011). This shortage of females is expected to result in around 40 million surplus single males by 2020 (Hamme, 2011). This large population of single frustrated males could, in extreme cases, be a source of social instability and crime associated with kidnapping and trafficking of women for marriage (Guilmoto, 2010). The danger to China's social stability from frustrated citizens is very real and already violent crimes are on the rise. Although public documentation is scarce, a professor at the China University of Political Science and Law in Beijing expresses his concerns about the increasing level violence in crimes. He blames the rise on the steadily increasing frustration and anger of those portions of society being left behind in the midst of China's rapid economic expansion (Areddy, 2011).

Technological

China is steadily steering its manufacturing industries away from low-value-added products for export towards higher value goods such as IT and telecommunications equipment. According to the World Bank high-tech goods accounted for 30.98% of total exports in 2009 (The World Bank, 2011). Technological progress accompanied by increases in capital investment and rises in human capital have improved Chinas labor productivity at a rate of 10% a year since the early 1990s and even more quickly in the past decade (Leunig, 2011). World Bank data shows that 15% of the world's patent applications by private citizens in 2007 came from China (The World Bank, 2011). Incidentally China is also home to the largest internet population in the world which approached 500 million users in 2011 (Hille, 2011).

Chinas efforts to move its manufacturing sector up the value chain and maintain sustainable growth in the future are concentrated on 7 key areas namely: biotechnology, rare materials, new information technology, internet security infrastructure, high-end equipment and manufacturing (aerospace and telecommunications equipment), energy conservation and environmental protection, new energy (wind and solar power) and clean energy vehicles (Government of China, 2010).

To fund all these projects the Chinese Government has set research and development (R&D) expenditure at 1.44% of GDP for the 12th Five Year Plan (Government of China, no date) and has released numerous R&D and innovation incentive policies, such as tax breaks for high technology industries and venture capital support for startups (Government of China, 2006). As a result of these policies China now enjoys the title of the world's 19th most competitive country according to the 2011 IMD World Competitiveness Ranking (IMD, 2011).

Legal

The open door policy and the impressive economic growth over the last 30 years have had a significant influence on China's regulatory environment. In order to attract foreign investment and ensure a stable business environment, legal to increase transparency of judicial frameworks has become a priority. Although many new laws and regulations have been "borrowed" from developed countries they are modified to suit the CCPs special needs.

The CCP as the only influential political party is very much integrated in all functions and levels of the state. As such the separation of powers between legislative, judicial and executive institutions is not established. As a result of this total integration and the lack of a meaningful political opposition, there exists no credible mechanism by which to monitor the members of the ruling party or their actions. This in turn has led to rampant corruption, local protectionism, various conflicts of interest and a huge hurdle for effective law enforcement (CountryWatch Incorporated, 2011). Intellectual Property Protection for example is a topic that has received a lot of attention in the past decades. Although numerous laws have been introduced to protect IP rights, consistent enforcement is still not a reality (BBC, 2011).

Environmental

In 2007 China overtook the US as world's largest emitter CO2 gas. Although there has been a four-fold increase in the efficiency of energy use between 1979-2007, the country's major industries including electric power generation, are by far less energy efficient than their counterparts in developed countries utilizing over 5 times more energy per unit of GDP than the US. China's intense growth in recent years has further dramatically increased its demand for energy, and a lack of attention to the environmentally detrimental effects of its rapid industrial development has resulted in high levels of air and water pollution, a rapid fall of the water table and soil erosion resulting in the loss of arable land (CountryWatch Incorporated, 2011).

In March 2011 China took a significant step towards a more sustainable development by including a series of sustainable development goals in its 12th Five-Year Plan, which places an emphasis on increasing energy efficiency and increased research into renewable power sources such as wind and solar power and clean energy vehicles (Government of China, no date). A numerical target of decreasing energy and CO2 emissions by a 3.5% reduction per unit of GDP was also established (CountryWatch Incorporated, 2011).

2 Demography of India

2.1 History and Drivers of Demographic Development in India

Fertility rates have dropped significantly since India achieved independence in 1947, with the total Indian fertility rate reaching 2.6 in 2008 compared to 6.0 in 1966. Although fertility rates

have dropped and population growth has slowed from around 2% a year between 1961-1991 to 1.6% from 2001 to 2011, the total addition of people to the population per year remained almost the same. The steep drop in fertility rates cannot be attributed to the numerous failed family planning programs initiated by the government since the 1950's including one which included a mass sterilization campaign in the 1970's (Time Magazine, 1977). But must be attributed to the dissemination of a new reproductive idea, which is to have fewer children and invest more in their futures (James, 2011). This has led to an increase in the usage of contraceptive methods. Interestingly however female sterilization is still by far the most common contraceptive method in use today (WHO, no date).

At the same time mortality rates have declined and adult life expectancy has almost doubled from 38.7 years for males and 37.1 years for females in 1950 to 64.4 year for males and 67.6 years for females in 2010. Especially infant mortality rates have declined from 225 deaths per 1000 live births to around 50 per 1000 for the same time period. The current level of 50 deaths per 1000 newborns is still a very high and varies strongly between states and regions, with those states that have the highest fertility rates also having the highest infant mortality rates. This however is not necessarily an indication of the income level in those states, as poor families are also accepting the small family norm (James, 2011). The reduction in family sizes has however exacerbated a disparity in the sex-ratio as a strong son-preference still exists in India. Between 1991 and 2011 female numbers in the age groups of 0-6 years have declined from 945 to 914 females per 1000 males. According to James: "It is argued that there is a 7.1million deficit of females in the 0-to-6-years age group in 2011 (26). This points to sex-selective abortions to the magnitude of 3.1 to 6 million female fetuses during the 2001–2011 decade (26)." (James, 2011). Interestingly this phenomenon seems to be more common for families in which the mother has received 10 years or more of education (James, 2011).

2.2 India's Demographic Future

By 2050 India's population will have exceeded China's by about 400 million people with India's population expected to reach its peak of around 1.72 billion people in 2060. After this point the population is expected to shrink to 1.56 billion and become stable around that level by the year 2100. This projection however assumes that life expectancy will reach 70 years in 2035 and that the replacement level fertility rate of 2.1 will be achieved around 2050. The projections of the Population Foundation of India and the Population Reference Bureau however only expect a stabilization after 2080 at a population size of around 1.86 billion, assuming replacement level fertility rates being achieved in 2050 and life expectancy reaching 70 years by 2025 (James, 2011).

As a result of the decrease in both birth and death rates India has set itself up to benefit from

a large demographic dividend shown as a large bulge in India's age-sex pyramid. Currently the dependency ratio lies at 55% and is expected to fall to 47% by 2035 with 68% of the population being of working age, which will amount to just over 1 billion people (James, 2011).

2.3 Opportunities and Challenges for India: PESTLE Analysis

Political

India is the world's most populous democracy with just over 1.2 billion citizens as of March 2011 according to the Office of the Registrar General of India (Government of India: Ministry of Home Affairs, 2011). It is a pluralistic political system with 9 national parties and 48 state parties representing a total of 543 parliamentary constituencies. It is a very complicated political system, which in the past and present has all too often gained international attention and has incited national fury for its numerous and repeated corruption scandals and political assassinations. None the less its constituents enjoy relatively orderly and free general elections every five years. Currently the ruling coalition is the Congress Party-led United Progressive Alliance (UPA), which has been in power since 2009 and consists of around a dozen parties. Even so it does not hold a ruling majority in parliament (CountryWatch Incorporated, 2010). This constellation makes it extremely difficult for consensus to be found on virtually any issue, which makes India's explosive development all the more impressive. It does however stint India's ability to capitalize meaningfully on its rich demographic dividend as many economic reforms keep getting blocked by leftist coalition members.

Economic

Despite the constraints of India's political system several measures to open up India's economy have taken effect. Important measures include the reduction of prohibitively high customs-tariffs, which have dropped from over 60% of imports to around 7% from 1986 to 2009, the abolishment of the so called "License Raj" system, a system under which fees were levied on virtually all business transactions, as well as sweeping privatizations in the 1990's (The Economist, 2010). Due to these and other reforms India has enjoyed an average annual GDP growth rate of 7.15% over the last decade with annual growth rates between 2005-2010 consistently being over 9% except for in 2008 where it dropped to 4.93% (The World Bank, 2011).

Foreign direct investment (FDI) inflows have also grown explosively with total FDI Volume having grown by 96 times between 1992 and 2010 (Reserve Bank of India, 2011) and total FDI inflows in 2010 amounted to nearly US$ 38 billion (Department of Industrial Policy & Promotion, 2011). It must be noted however that 42% of total FDI originated from Mauritius, which has a double taxation avoidance agreement with India and thus makes it possible for Indian companies or private persons to engage in "round tripping" which is a form of tax evasion (Arun, 2009). The services sector attracts more FDI than any other single sector. Indeed Services are the main drivers of economic growth in India accounting for 55.2% of GDP in

2010 (CIA, 2011), followed by industry and agriculture with 26.3% and 18.5% shares respectively. In contrast to other emerging economies the services sector is responsible for more growth than industry and agriculture combined. Half of that growth can be explained by total factor productivity (TFP), which is a measure for the efficiency of the use of labor and capital inputs (Standard Chartered Bank, 2010). Although the efficiency of capital allocation is evidently high in the Indian service sector, as it is the strongest growth driver while employing only 34% of the workforce in 2009, TFP is quite low in the agricultural sector as it employs 52% of the workforce while delivering the lowest growth rates of around 6.6% in 2010 (Capital Market, 2011). This shows us that agriculture in India is inefficient and suffers from a low degree of automation. Because of this large portion of people working in the agricultural sector India's urbanization rate lies at only around 30% in 2010 (CIA, 2011). This makes it more difficult to create high productivity clusters, by combining skilled workforces and companies to benefit from economies of scale as well as inter-organizational cooperation and innovation (James, 2011).

Another one of the great hurdles to be overcome is the very poor condition of infrastructure. India's road network is one of the largest in the world but only half of it is actually paved and only 2% are expressways which have to handle 40% of traffic. The low average speed of 30km/h due to the bad roads and corrupt state border officials make logistics costs extremely high amounting to roughly 40% of the cost of the products that are being forwarded (Kilgore, Joseph, & Metersky, 2008).

India has high unemployment rates of 10.8%, due to a mismatch in the supply and demand in skilled labor. Currently 40% of the working population over 15 years is illiterate and another 40% has not completed primary education (The Economist, 2010), with average numbers of years spent in schooling for males lying at just over 6 years (Ward, 2011). The low employability of those parts of the population with little to no education presents a huge potential for wastage of the demographic advantage. In response to this problem and the deplorable state of public schools, cheap private schools have been springing up in rural areas and already 20% of children in poor rural areas visit these schools (The Economist, 2010). Additionally parents in rural areas are becoming increasingly aware of the importance of education and are not pulling their children out of school to work in the fields as much any more. As a result literacy rates are rising fast with literacy rates being over 80% for the population aged 15-24 years (The Economist, 2010).

Additionally Inflation poses a threat to India's development, as inflation rates according to consumer prices reached 12% in 2010 (CIA, 2011).

Societal

India's population is characterized by an extreme heterogeneity between regions and states with large differences in income, religion and population structure. More than a quarter of

India's population lives beneath the poverty line (CIA, 2011) which has led to great resentment and anger directed at wealthier social spheres. However religion is also a source of social instability in India, where 80% are Hindus followed by 14% Muslims and others (CountryWatch Incorporated, 2010). According to the US Department of State and the Overseas Security Advisory Council (OSAC), India had the fourth highest number of fatalities from terror-attacks worldwide in 2007. This puts it behind Iraq, Afghanistan and Pakistan. Most attacks are carried out by Islamist insurgents around the Pakistani border or Communist (Maoists) secessionists called Naxalites in the west and north-west of the country. So far the government has not able to respond sufficiently to these terrorist activities or even to local crime within the country (Institute of Management & Administration, 2009). Despite such high levels of internal conflict and the increasing threat to India's development from populist policies, India scores quite highly on CountryWatch's Political Stability Index, achieving a score of 8 in 2010 (CountryWatch Incorporated, 2010).

In terms of public attitudes 85% of Indians thought the government was doing a good job of handling the economy in 2010. On the negative side however only 45% were satisfied with the overall condition of the nation (Pew Research Center, 2010).

Technological

India is one of the world's leading locations for offshore R&D with around 300 multinational corporations having established research and development (R&D) centers in the country (Committee on Global Science & Technology Strategies, 2010). While corporate research centers in India are able to compete with their counterparts in developed countries, structural deficits ranging from brain drain to a lack of government support are hindering the maturation of the country's technological potential. Although the Indian government holds a share of 74% of all national R&D expenditure and runs a network of 400 laboratories and 400 R&D Institutions, it does very little to promote careers in research to students while still in education: Students are instead encouraged to get a "real job". For example of it's 300'000 annual computer science graduates only 100 pursue PhDs in that field compared to 1500-2000 in China (Committee on Global Science & Technology Strategies, 2010). While India has the 3rd largest tertiary education population worldwide as well as a handful of world class universities, only 10% of students attempt to achieve higher education. This is low compared to a 20% average for developed nations (James, 2011). As a result the Boston Consulting Group "… sees a shortfall of 200,000 engineers, 400,000 other graduates and 150,000 vocationally trained workers in the coming years. Meanwhile, there are 62m surplus workers in agriculture, most of them barely skilled." (The Economist, 2010). Although tax incentives do exist in order to encourage companies to engage in R&D, the emphasis lies on development rather than on research. This creates a rift between business and research as corporations have no rea-

son to sponsor relevant university institutes and courses.

The government has become increasingly aware of the importance of connecting all the three elements of education, research and business (Chandran, 2009) and is expected to include new research incentives in the new direct taxes code of 2012 (Deloitte, 2011). Additionally the government is set to double R&D expenditure from 0.9% of GDP to 2% of GDP while focusing on 6 key areas of research, namely space technology, biotechnology, coastal protection systems, atomic energy, open-source drug discovery and infrastructure technologies. An increase of spending on education from 4% to 6% of GDP is also planned (Chandran, 2009).

Legal

As is the case for India's political system its legal system is complicated and plagued by inefficiencies and endemic corruption. According to the corruption perception index India scores a 3.3 on a scale of 1 (highly corrupt) to 10 (very clean) (Transparency International, 2010).

This of course impacts not only individuals seeking justice in cases of land disputes and forced migration for example, but also entrepreneurs and companies seeking to enforce contracts. According to the World Bank it takes an average of 1420 days to enforce a contract (The World Bank, IFC, 2011).

Environmental

India's rapid economic development has put a large amount of strain on its natural resources with the main problem areas being deforestation, loss of biodiversity and pollution. Although India has achieved increases of forest coverage by an average of 0.5% a year between 2000-2010 (The Economist, 2011), these growth figures are deceitful, as they comprise both forest area gains through reforestation projects, as well as through increases in plantation areas. A loss in biodiversity despite net growth in forest coverage is a result of this method of calculation. Despite this promise and the government's real concern for a healthy ecology, very little is actually being achieved in this area. According to an audit report carried out in 2009, a total of 71.51% of government funding given to numerous state departments and private contractors in the ten years from 1999-2009 cannot be tracked to any specific projects due to missing or outstanding utilization receipts. As a result a stunning 93% of reforestation projects did not reach their targeted objectives. In fact all departments analyzed did not come close to fulfilling their objectives (Comptroller and Auditor General of India, 2011).

India is the world's third largest emitter of CO2, although its' per capita emissions of CO2 are less than 10% of those in the US it produces four times more emissions per unit of GDP than the US.

3 Global Implications of the Rise of China and India

If we consider the insights gained from the PESTLE-Analysis of both China and India we can

draw some conclusions as to how the two countries will affect the global order in terms of political, economic, environmental and investment perspectives in the near future.

China

As China shifts its production towards medium- to high-technology products it will create opportunities for less developed economies to pick up the slack in manufacturing low-value added products. This is already happening as steadily rising wages are driving off companies looking for low manufacturing costs. India for example, with its vast and cheap labor force and underdeveloped manufacturing sector could benefit from this shift. If successful this shift could also mean that China could become a driving force in world innovation and technological progress. Additionally, as China's middle class is expected to reach a size of 700 million people in 2020, it will itself become a huge consumer of goods produced outside of China, thus creating a huge new market for economies producing both low-value and luxury goods and services (Hodgson, 2007). A study by the IMF has investigated the spillover effects of China's development. It has found that a 1% increase in Chinese GDP sustained over five year is associated with a 0.4% change in growth for the rest of the world (Arora & Vamvakidis, 2010).

China's huge foreign currency reserves are increasingly enabling and motivating China to take a more prominent role in global politics. It is achieving this by financially supporting less developed economies in order to establish strategic relationships with them but also by increasingly acting as a "rescuer" for large western corporations that have been hard hit by the recent global recession. Christine Lagarde's push to give emerging economies such as China a greater say within the IMF and thus the management of the world economy is proof of China's growing political clout (Hill, 2011). China's integration into global decision making will definitely introduce more diversity into global politics, however whether or not China's communist leadership and governance style will rub off onto the rest of the world still remains to be seen.

From an environmental perspective China's growing demand for resources and its growing middle class are sure to leave their mark. Already China is the worlds' largest producer of CO2 emissions in absolute terms, however in per capita terms its CO2 emissions are only around 25% as high as those of the US. As China's economy matures and its citizens become more wealthy its energy and commodity consumption is set to rise dramatically. This will have a large impact on the global environment as well as on global commodity prices.

India

As the Chinese and Indian demographic structures and the lines along which their economies are developing are quite similar, albeit with a large time lag, it is possible to assume that their future development will affect the global order in very similar ways.

As India's labor force is set to reach 1 billion people by 2035 it is not unreasonable to as-

sume that it could very well pick up China's mantel of being the worlds' factory. This in turn would again give the global economy the benefit of having a large cheap labor force for a few additional decades, thus allowing it to continue growing.

At the same time India's influence in the global political scene will increase as it amasses wealth. This growth and the accompanying wealth will in turn increase its own consumption of imported finished goods, which is already very large due to the sheer size of the population. Again added pressure on the environment rising and commodity prices are to be expected.

4 Policy Recommendations for China and India

For China and India to continue on their paths towards becoming developed countries several challenges have to be overcome and opportunities have to be taken advantage of.

China

In order for China to continue on its path to becoming a developed country, it must deal with the challenges it faces which are a rapidly aging population, high dependency on exports, social inequality, sex-mismatches, corruption, ecological deterioration and labor shortages.

With China's demographic dividend set to decline in 2015 due to a rapidly aging population, China must race to avoid a situation dubbed "aging before affluence". Currently only 15% of China's working population are covered by any sort of social security net, which means the largest part of the population is heavily dependent on their own savings and the earnings of their children once they retire. With per capita income still being very low in China this places a huge financial burden on younger generations which will end up having to support two sets of parents as well as their own families. By quickly establishing a comprehensive social security system that covers all members of the population the government could figuratively speaking kill two birds with one stone, as a good social security and pension system would remove the need to save such a large portion of income. This in turn would then increase domestic consumption and make china less vulnerable to external demand shocks. A study conducted by the IMF shows that a 1% increase in GDP spending on social security and other government insurance mechanisms could indeed increase household consumption spending by up to 1.25% of GDP (Baldacci, 2010).

Additionally an increase in retirement ages from 60 for men and 55 for women (Chen, 2011) as well as a change in policy to further open up capital markets would help to solve this problem.

Social inequality, sex-mismatches and corruption are difficult problems to solve. As in any capitalist system inequalities are endemic. There is no quick fix to be had without a serious intervention on behalf of the state. Such an intervention could in an extreme case come in the form of a renationalization of companies and private assets. In other words a resetting

back to communist values. This however could seriously undermine China's efforts to become a developed country as it would stop innovation and FDI in its tracks. By encouraging a rapid rise in wages, making first attempts at establishing a social security system and providing quality education for its entire population greater equality can be achieved. Similarly, for the problems of sex-mismatch and corruption, draconian laws and punishments do not seem to deter offenders. Proof for this lies in the still common practice of sex-selective abortion. Instead educational measures should be pursued to diminish the strong son-preference through cultural reconditioning. Educational methods should also be pursued in curbing corruption as perpetrators often do not realize how much damage their actions ultimately cause to the economy. Other measures, such as economic incentives (higher salaries for officials), and streamlined and transparent bureaucratic processes are also necessary components of an effective corruption fighting strategy. These anti-corruption measures would at the same time also curb pollution, as a large part of pollution could be avoided if officials tasked with monitoring manufacturing enterprises would actually do their jobs.

A possible solution to the ever growing problem of labor shortages in China would be to abolish or at least make amendments to its household registration system ("Hukou") which currently limits the geographic mobility of laborers and hinders migration between labor rich and labor poor provinces.

India

As we have seen India also has a whole catalog of problems to deal with. These are endemic corruption, terrible infrastructure, a cumbersome legal system, an undereducated workforce, lacking integration of R&D and business, political instability by insurgency groups, brain drain, low urbanization rates, ecological deterioration and inflation.

The list of problems seems overwhelming, however again it is possible to achieve great improvements by targeting specific problems first. With endemic corruption being arguably India's greatest hurdle to solving any of its problems it is absolutely vital that it is tackled quickly and aggressively. Curbing corruption will guarantee that a much larger share of government funding will actually be able to be utilized for its intended purposes. By creating transparent monitoring structures for government agencies, outsourcing specific responsibilities to private companies and reaffirming the accountability of government officials problems such as ecological deterioration, useless infrastructure, poor education and political instability could be tackled more effectively. The fact that India hasn't even passed a law to protect whistle blowers is an indication of how little is being done. In fact private citizens have taken it upon themselves to combat corruption by setting up whistleblowing websites such as ipaidabribe.com in order to expose corrupt officials. What India needs is a complete restructuring of its legal system and its laws against corruption. It must give the comptroller and auditor general the authority to launch investigations and enforce basic rules and regulations

regarding proper documentation of activities by government departments. Educational measures, financial incentives and harsher punishments for both corrupt officials and private companies, as well as official channels for citizens to report corruption must be set up. An official naming and shaming program for exposing corrupt officials and private companies would help to increase awareness and mobilize a greater mass of people.

If the government is able to get a grip on corruption and government department monitoring, it will be able to improve its funding of its educational system and many social development programs. Industrial companies will also become more accountable for their polluting activities and sensible economic incentive schemes that already exist will actually be able to work.

5 Investment Opportunities in China and India

With the knowledge gained in the sections above it is possible to derive numerous investment opportunities in both countries. While the listing of investment opportunities below is by no means an exclusive list, it does incorporate the areas in which we see the largest potential for foreign investments in the near future.

China

Due to China's economic rebalancing away from low-value added export oriented production towards more high-tech production and a stronger domestic market, large investment opportunities will begin to materialize. As such it is safe to assume that the already large retail market will expand thus creating investment opportunities for branded goods companies to expand their retail networks within China. Especially Luxury goods makers can capitalize on the growing middle class markets. As Chinese consumers are increasingly demanding goods made by Chinese Companies equity investments into local Chinese retail and branded goods companies also appear to be a good opportunity.

As China also aims to increase the usage of renewable and "green" energies, both in electrical power production as well as vehicles, companies specializing in these technologies will find both the possibility of producing these technologies in China as well as a large market to sell them in. In fact these opportunities exist for all of the 7 key development areas included in the 12th five year plan.

In the event that policy restrictions on financial markets are loosened there could be a large new market to which to sell retirement fund and other financial services.

And for companies specializing in geriatric medical equipment, medical nutrition and elderly lifestyle products China obviously represents a huge market.

India

India's very poor infrastructure represents a huge opportunity for companies specializing in the production of road building, telecommunications and power generation equipment as the government is set to invest US$ 1 trillion into infrastructure and the manufacturing industry

over the next five years (Mukherjee, 2011). Additionally private companies already in or planning to enter India also represent a large pool of customers for basic infrastructural equipment such as back-generators.

Also companies specializing in logistics, distribution and freight management and willing to accept the risk of being early movers can profit from the clear lack of such sophisticated systems in India (Kilgore, Joseph, & Metersky, 2008).

Companies providing educational materials can also benefit from increased government spending on education and companies that run private schools can benefit from the growing number of rural families preferring to send their children to cheap private schools.

The renewable energy sector is also set to expand as the government plans to increase the share of renewable energy in electrical power production to 18% by 2022 (Ministry of New and Renewable Energy, 2011).

As incomes rise, so will the populations increased need for banking and other financial services, which in the long run represents a huge business opportunity for financial service providers. While there are business opportunities to be found for financial service providers among India's rural poor in the form of microcredits for example, profits margins are small and administrative complexity is large. However early movers in this field can already start to establish brand loyalty within a population group that will probably experience an growth of its middle class of 5% today to 40% by 2025 (Beinhocker, Ferrell, & Zainulbhai, 2007). As such branded and luxury goods companies also stand to gain from a growing consumer market and an early establishment of brand loyalty.

If the Indian government decides to recruit external support in its efforts to fight corruption, it is also imaginable that auditing and consultancy firms could find a lot of business in helping the government reshape its administrative and governance structures.

Conclusion

As we have seen China and India's demographic structures are quite similar despite a time lag in favor of India which is set to take full advantage of its demographic dividend in 2025, a full decade after China is set to lose its own demographic advantage. Both countries face similar challenges regarding environmental and social challenges and similar economic and technological opportunities, but in answer to the question of who will win the race to becoming a developed country it is quite obvious that China will achieve this status first. Although both countries had a fresh start in the early 1950's, their respective development followed completely different trajectories. China with its communist government has been able to push through reforms that, while often detrimental to its own people over the short run has proven to be beneficial in the long run to the country as a whole. India with its complicated and corrupt democracy however has struggled to overcome the large cultural, political, demographic

and religious rifts within its society but has none-the-less managed to develop rapidly albeit with a time lag compared to China.

As both countries will one day inevitably reach the status of developed countries it is our opinion that the question as to who will win the race is not a fitting one. It is more a question of which country will succeed in bringing prosperity to all of its citizens in a fair and equitable way. In this respect both countries still have a long way to go. Although millions of people have been lifted out of poverty, huge disparities in income, health and quality of life still exist within their populations.

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Demography meets the Alpine regions;

The case of the Canton Grisons, CH

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Megatrend 'Global Demographic Change': Tackling
Business and Society Challenges in 2030 and Beyond
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November 2011

Executive Summary

Grison is with a population of approximately 192'000 and with a land size of 7'106 km^2 the biggest canton in Switzerland and the main focus of this paper's analyses. The canton has with about 26 people per km^2 the lowest density in Switzerland and is famous for its mountain, valleys and lakes with some well-known places like St. Moritz and Davos.

Nonetheless, it has also been hit by the demographic changes which have taken place around the world – indeed with different characteristics – but all with a big impact on today's society structure.

The demographic change of Switzerland has begun around 100 years ago and has since then passed three main cycles. Namely the "Depressiongeneration" – born around 1930 with many children -, the highly numbered "Boomgeneration" – born between 1940 – 1960 with few kids – and the numerical low "Wealthgeneration" – born between 1960 – 1990 and characterized by longevity. These evolvements have been changing the famous age pyramid structure over the years. The causes of this change are different, but as mentioned above, are mainly driven by the birth rate (fertility), death rate (longevity) and the movement (migration) of a generation.

The canton Grisons was hardest hit by birth and death rate and owes its population growth, which has ever been below Swiss average, its positive international migration. This can be assigned to location attractiveness which is driven particular by taxes, rental rate, number of workplaces, wage levels, accessibility of services, mobility and education level of the region. Though, the canton Grisons is subjectively mainly rated below the Swiss standard, for foreigners the attractiveness is high, mainly driven by low taxes for legal entities.

The outlook can be divided into a high, middle and low scenario. Whereas the latter is characterized by depopulation and the first two by repopulation. These scenarios are based on assumptions and the middle scenario, which is based on general trends, is the most likely and will therefore be further described. This evolvement will finally change the pyramid age structure into an urn form which again will have impacts on the cantonal budget, the economy, the services provided, and the living space.

For the cantonal Grison, which has little influence on the large scale effects of a changing society taking place around the world and impacting merely all nations, it is crucial to tackle its problems with innovation and forward looking coupled with a sense for pragmatism. Possible measurement can be gathered around the world and work slightly adjusted just well for a small canton like Grisons. It is essential for the canton to differ their strategies for urban, tourism and rural regions.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

ARE Amt für Raumentwicklung Graubünden

BFS Bundesamt für Statistik

CBT Community Based Tourism

FSO Federal Statistical Office

GDP Gross Domestic Product

1 Letter of Scope

1.1 Initial Position

Grisons has a population of approximately 192'000 and with its land size of 7'106 km^2 it is the biggest canton in Switzerland. Therefore, Grisons is the canton with the lowest density with about 26 people per km^2. Nevertheless, the canton is well known because of its mountains, valleys and lakes. With St. Moritz, Davos and other beautiful places, several of the most famous ski resorts are located in Grisons. Furthermore, the canton of Grisons is the only canton in Switzerland with three official languages, namely German, Italian and Romansh. (Graubünden, n.d.)

"Wir sind auf dem besten Weg auszusterben"[74] (Amt für Raumentwicklung [ARE], 2007, p. 1). With such words decorated several local media the front pages of their newspapers. The word „Wir" refers to the inhabitants of the canton Grisons. The concern about the future of the canton increases because of the population development, the population movement and the ageing of society. (ARE, 2007, p. 1)

1.2 Project Objectives

The aim of this paper is:

- to demonstrate the key drivers of the past demographic development of Grisons and to compare its evolution with Obwalden and Switzerland.
- to work out possible scenarios for the future with their implications for the canton.
- to develop some ideas and measures for a prospering development of Grisons.

1.3 Structure of the Paper

The paper is divided into three main parts. At first, the demographic change of Grisons until 2010 will be described. Parts of this chapter are the development of the canton, the causes and effects of this development and lastly a comparative analysis between Grisons and the canton Obwalden. The second main chapter includes the forecast until 2030. A low, high and middle scenario based on different assumptions will be introduced. Last but not least, a proposal for a "healthy, wealthy and prospering Grisons 2030" follows as the last key part. This part consists of various measurements for the urban, tourism and rural regions of the canton Grisons.

[74] We are on the best way to extinct

2 Demographic Change until 2010

The composition of our society has been changing over the last couple of decades and will continue to do so. In the following chapter 2.1, the team would therefore like to shortly describe three large scale cycles in demographic change in Switzerland. In a second step, namely in chapter 2.2, the team lays its focus on two specifically selected cantons – Grisons and Obwalden - in Switzerland. The team analyses what are causes and effects of the demographic change and what the main differences and similarities between Grisons and Obwalden are and how they may differ to the general trend in Switzerland. Whereas Grisons serves as the reference canton, and if not mentioned otherwise, the canton Obwalden and Switzerland do not differ mainly in the observed findings. In chapter 2.3 a comparative analysis between the two cantons is made referring to their location attractiveness.

2.1 General demographic development in Switzerland

Main cycles

To fully understand today's situation one has to look into the past. From 1900 until 2010 the population in Switzerland has more than doubled. It grew from 3.3 million to 7.8 million. This growth evolved in different stages which can be characterized by three main steps, namely the "Depressiongeneration", the "Boomgeneration" and the "Wealthgeneration". In general, the population size is determined by life expectancy, fertility and migration (Trippel & Groth, 2011, p. 2).

Depressiongeneration

This generation was born around 1930, when the fertility rate was low and the population was therefore numerical low. However, they had a lot of children's in the post war era. Additionally, the mortality rate was declining. (Möckli, 1999, p. 28)

Boomgeneration

The 40- and 50-some were numerical extremely high but their fertility rate was significantly below the trend (Möckli, 1999, p. 28). Reasons for the lower fertility rate were improvement of personal wealth, higher education and personal freedom (Trippel & Groth, 2011, p. 2). This has had the biggest impact on today's ageing pyramid.

Wealthgeneration

Born in the late 60-, 70- and 80-some, this generation was again numerical low due to the low birth rate in the late 40-some. In addition, the "Wealthgeneration" can be described as an

ageing population due to longevity. (Möckli, 1999, p. 28) This increase in life expectancy is due to higher living standards, balanced nutrition, constantly improving health care and medical services (Trippel & Groth, 2011, p. 2).

These different strengths of the generations have a deep impact on the age structure in today's society. A numerical low generation ("Depressiongeneration") with a high fertility lead to a profound birth surplus 20 to 30 years later. The following "Boomgeneration" should have led to big amount of newborns. However, their low fertility rate did not led to an absolute decline in the birth rate due to their numerical population strength. (Möckli, 1999, p. 27) The longevity of the "Wealthgeneration" did the rest to change the pyramid-structure to an "urn"-structure.

Causes and Effects

The above mentioned main cycles have had an apparent impact on Switzerland's age structure which can be visualized impressively in Fig. 1. Not only are the inhabitants getting older but also the mixture between young and old has been changing dramatically and the indicators speak for themselves that the trend is not going to return in the near future.

The change in the structure of our society has various reasons and the project team is going to mention and describe the most common ones which generally have had the biggest impact and are likely to have more in the future.

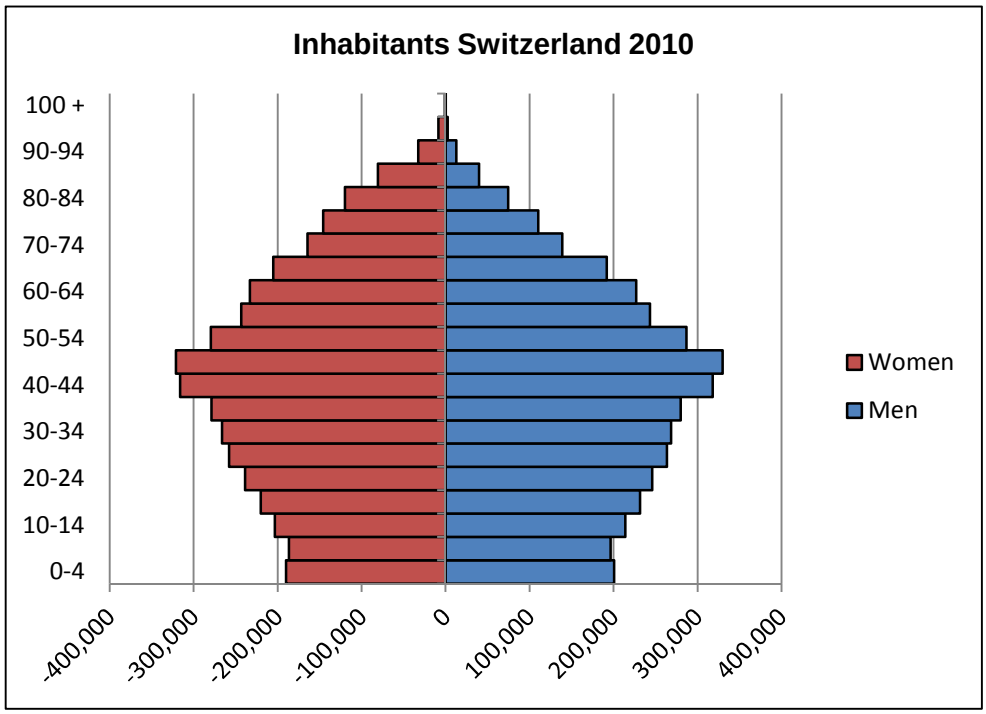


Fig. 1: Age structure in Switzerland. Source: own illustration based on: GR (n.d. A)

2.2 Demographic change in Grisons vs. Obwalden and Switzerland

To be able to compare Grisons with Obwalden and Switzerland, the figures in the following charts will be indexed if necessary. This guarantees a better comparison and the charts are not distorted by absolute figures. Nevertheless, the main focus of this chapter lies on the development of Grisons and therefore some paragraphs only describe its development. A comparative analysis between Grisons and Obwalden will follow in chapter 2.3.

Development from 1850 until 2010

Fig. 2 shows the development of Grisons from 1850 until 2010 in comparison to Obwalden and Switzerland. From 1850 - 1980 Grisons and Obwalden have been growing likely though slower than the average of Switzerland. Whereas Obwalden got back on track in 1980 and has since then been growing equally to the average of Switzerland, Grisons has been grow-

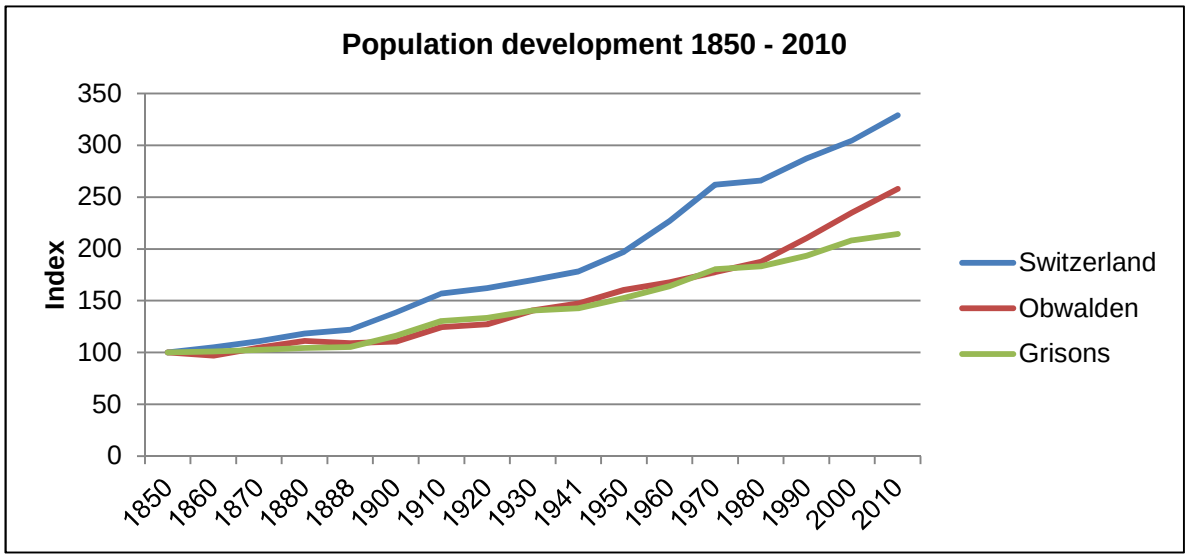


Fig. 2: Population development in comparison. Source: own illustration based on: BFS (n.d. A)

ing comparatively low.

Regional population development in Grisons

As Fig. 2 illustrated, the population of the canton Grisons grew about 108% during 1850 and 2000. However, some regions grew much faster than the canton while others even depopulated. Fig. 3 shows the historical population development of the 13 regions of Grisons graphically during the time period of 1850 until 2000.

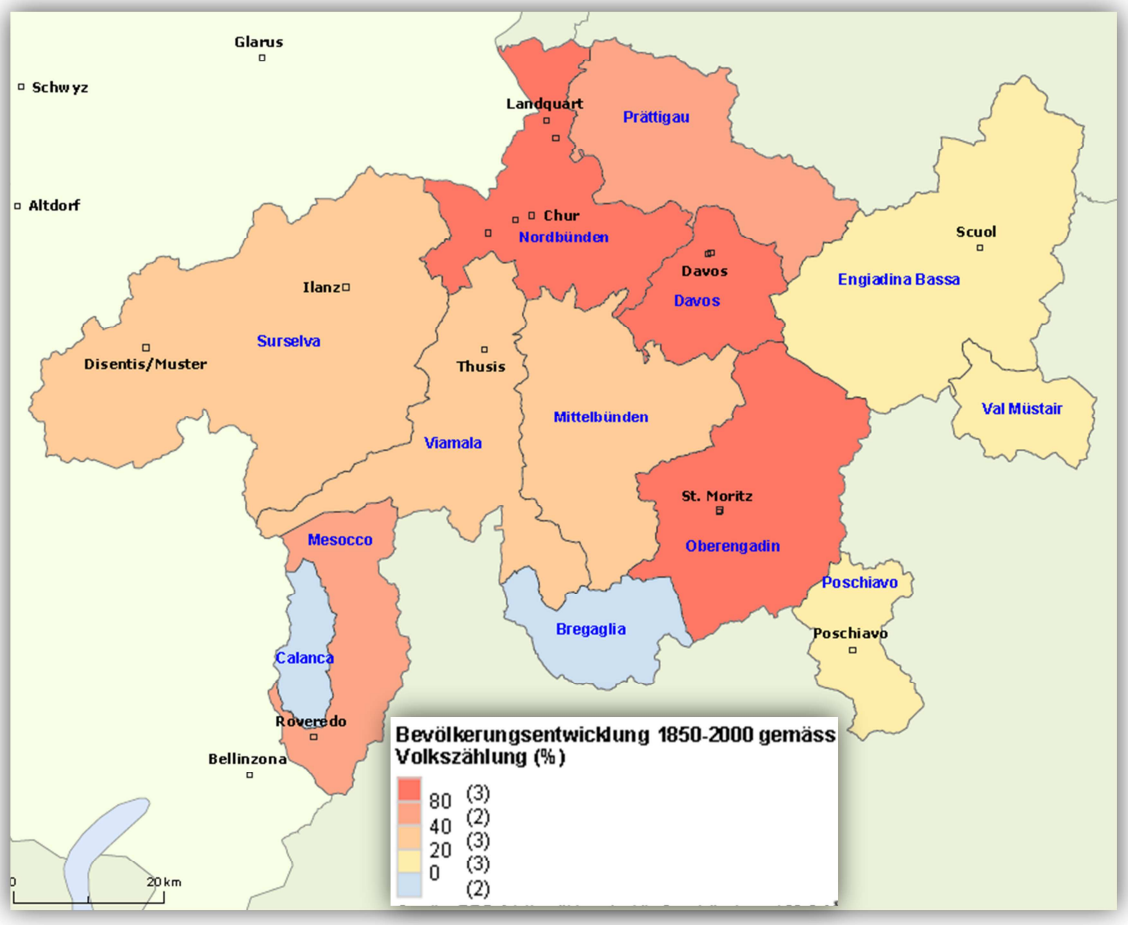


Fig. 3: Population development in the regions of Grisons (1850 – 2000). Source: GR (n.d. B)

With a population decline of minus 49% respectively minus 2%, the regions Calanca and Bregaglia were the only two regions of Grisons without a growth. Calanca valley is located in the south of Grisons at the border to Ticino. It is one of the remotest parts of Switzerland and therefore not easily accessible by transportation. (Pfadpfinderinnenstiftung Calancatal, n.d.) Both depopulated regions are Italian speaking areas. Nevertheless, while Calancas population constantly decreased, could Bregaglia record a repopulation of about 11% over the last 30 years.

Besides the two decreasing regions, there are eight more areas which repopulated below the cantons average. Prättigau, which had the highest increase of the latter, grew by 64% during the last 150 years. Switzerland in comparison, more than tripled the number of inhabitants at the same time. Even a higher population growth than Switzerland had the three regions Nordbünden (271%), Oberengadin (493%) and Davos (520%).

With Chur, the capital and biggest city of Grisons is located in Nordbünden. The most popular city of Oberengadin is probably the ski resort St. Moritz. Davos is not only the area with the highest repopulation but also one of the only two existing cities of Grisons.

Communal population development in Grisons

After a short analysis of the population development in the various regions of Grisons, this paragraph focuses on the change within the municipalities. In the end of 2010, Grisons counted 180 municipalities. Tab. 1 demonstrates how the population size distribution of those municipalities looks like and which depopulated during the period of 1980 until 2010.

Tab. 1: Municipalities of Grisons per 2010

Inhabitants per Municipality	Number in Grisons	% of Depopulation (1980 – 2010)
<100	22	45.5%
100 – 500	83	21.7%
501 – 2'500	59	10.2%
2'501 – 10'000	14	0%
10'000+	2	0%

Source: own illustration based on: GR (n.d. B).

The canton of Grisons counts two cities with more than 10'000 inhabitants, namely Chur and Davos. More than 90% of all villages in Grisons have less than 2'500 residents.

The bigger villages and cities grew within the last 30 years without expectation. From the 180 municipalities, only the ones with a population of less than 2'500 had depopulation. Almost every second municipality with less than 100 inhabitants had a population decline which shows that the little mountain villages are endangered from extinction.

Causes and Effects

Chapter 0 deals with the main causes and effects of the past development in Grisons. Thereby, it tries to answer the following questions:

- *How was it possible that Grisons ever since has grown slower than Switzerland?*
- *Why grew some regions faster than others and why had some even depopulation?*
- *Why depopulated the smaller villages more in proportion to the canton?*
- *Was the population growth in Grisons due to intercantonal or international movement?*

As mentioned earlier in this paper, the overall population size of a given nation or canton is driven by life expectancy, fertility and migration.

Birth rate and death rate

One cause for the slower population growth in Grisons compared to Switzerland and Obwalden could be a lower birth rate and a higher death rate respectively. As Fig. 4 shows, the

birth rate and the death rate converge in the canton Grisons which leads inevitable to a continuous decrease in the birth surplus. Since 2005, there are even more deaths than live births counted.

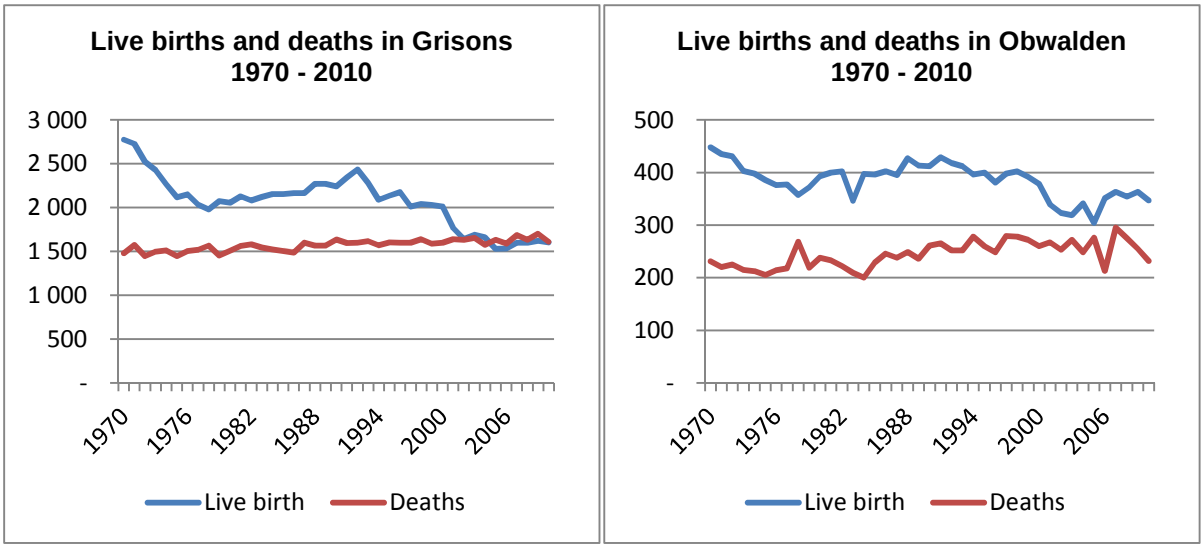


Fig. 4 and 5: Live births and deaths in Grisons and Obwalden during 1970 – 2010. Source: own illustration based on: BFS (n.d. B).

In Obwalden on the contrary, the convergence between live birth and deaths has never been so dramatically and since 2007, the death rate has even been decreasing more quickly than the live births which can be seen in Fig. 4 and 5.

In Switzerland, both trends evolve more or less parallel, which means that the live births offset the deaths. The only similarity to Grisons was the deep decline of the live births in the seventies which can be assigned to the “Boomgeneration” with its low fertility.

Life expectancy

Due to various reasons such as a better health system - health care, medicine, emergence infrastructure, prevention, healthier nutrition - the life expectancy in Switzerland increased over the last decades. While in 1981 the life expectancy of a man was 72.4 years, in 2009 it reached 79.8. Women are expected to live even longer with 84.3 years. The expectation in Grisons is slightly under the Swiss average with 79.4 respectively 83.9. (BFS, n.d. F)

Dependency Ratio

Dependency ratios are measures to show a proportion of a population which is economically dependent on others (Morgan & Kunkel, 2011, p. 60). In this paper, anyone under 20 and above 65 is considered to be dependent on the population between 20 and 64. In Grisons and Switzerland this ratio declined from about 65% to 61% within the last ten years (appen-

dix, Fig. 9). This is because the number of population under 20 years declined while the number of 65+ increased.

The more illustrative ratio is the inverse aged dependency ratio, which shows how many working-age people are needed to finance one retiree (Morgan & Kunkel, 2011, p. 60). The formula below illustrates how to calculate the ratio.

$$Inverse\ aged\ dependency\ ratio\ = \frac{number\ of\ people\ aged\ 20-64}{number\ of\ people\ aged\ 65+}$$

Tab. 4 shows the development of the inverse aged dependency ratio between 2000 and 2009 (appendix). While in 2000 about 4 persons had to work for one retiree, it declined to 3.6 in Grisons (3.7 Switzerland) which means that less workers have to pay for one pensioner. This decline is one of the reasons for the hole in the pension reserve of Switzerland. (BFS, n.d. E) Even lower is the ratio in the rural regions of Grisons where it reaches 2.3 (ARE, 2009b, p. 15). The previous paragraph about life expectancy showed one cause why the inverse aged dependency ratio declines.

Population movement

In 1860, nearly three-quarter of the inhabitants lived in the same canton as they were born. In 1990, only 30% of the population in Switzerland stayed in the same canton. (Möckli, 1999, p. 27)

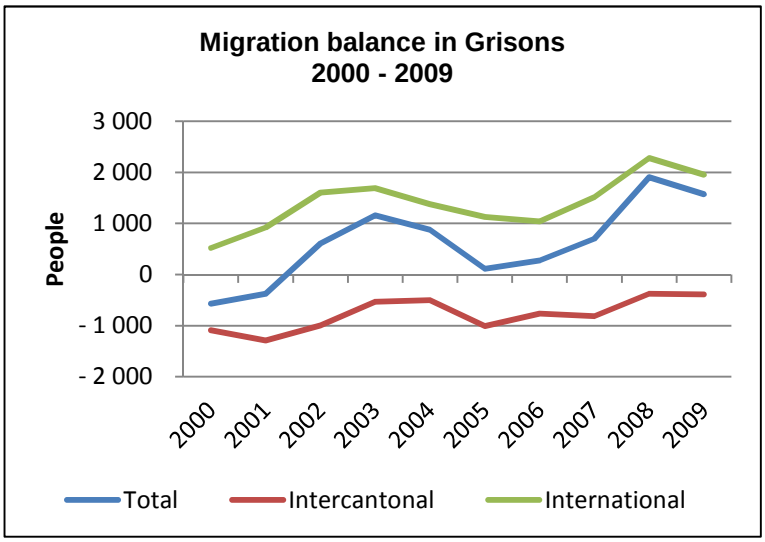


Fig. 6: Migration balance. Source: own illustration based on: BFS (n.d. C).

Over the last ten years, the canton of Grisons grew constantly. However, the main factor of this population incline has been the migration of foreign people while the intercantonal movement has been permanently negative. Although the repopulation in Obwalden was also mainly due to the international migration, the intercantonal movement has been positively in three out of the ten measured years. To understand such movements, one has to know the reasons for selecting a canton or a region to live. Below are some possible factors listed, which could influence a person or family to move to another canton.

- Living situation (taxes and rental rates)

- Economy (taxes, workplaces and wage levels)
- Infrastructure (accessibility of services, mobility and education)

A detailed description of the listed reasons follows in chapter 2.3 with the comparison between Grisons and Obwalden.

Urbanization

As described in chapter 0, the cities and big villages of Grisons had a big population incline. Reasons for this urbanization could be the employment opportunities which are offered in those regions. Nordbünden itself contributed almost half (43.6%) of Grisons GDP. The region had an economic growth which was even higher than the national average within 1990 and 2008. The neighboring regions such as Prättigau or Mittelbünden depend on the economic power of Nordbünden because a lot of commuters work there. (Held & Schoder, 2010)

The rural regions of Grisons are an ageing society with a rising tendency. Therefore, a lot of schools had to be shut down respectively pooled together. As a consequence, school children have to accept a longer way to school. Nowadays, in less than 50% of the rural municipalities exists a primary school. (ARE, 2009b, p. 10 and 23)

Another cause for the urbanization is the decline of farms and with it the decrease in working places in the rural regions (ARE, 2009b, p. 10). More than 1'000 companies from the primary sector closed between 1995 and 2008 and 3'500 workers had therefore to look for a new job. (BFS, n.d. D)

Due to the urbanization, several rural municipalities are on the way to become extinct. According to NZZ am Sonntag (2009), the canton Grisons sees for 22 of those communes no chance of survival. Therefore, the canton considers a coordinated withdrawl which would lead to less investment into the infrastructures of the affected communes. That again decreases the attractiveness of the area. Nevertheless, some politicians strongly disagree with the intention to stop investing in those municipalities.

2.3 Comparative Analysis between Grisons and Obwalden

Fertility and life expectancy are quite the same in each area of Switzerland. The differences of the developments in the cantons are mainly driven by migration. Furthermore, positive or negative migration balances depend on the attractiveness of a canton Therefore, the focus this chapter lies on the comparative analysis between the two cantons, namely Grisons and Obwalden. In a first step, the main factors which influence the attractiveness of a location are applied on the two cantons of comparison. Then, Tab. 2 shows a subjective classification of the cantons for each factor.

Living situation

Taxes for natural persons: *Income and capital taxes* for natural persons are in Grisons about 12% above the Swiss average in 2006. Six years earlier, Grisons used to be almost 20% below the average. Inhabitants of Obwalden on the other hand have to pay the most income and capital taxes compared to the rest of Switzerland (46% above average). (BFS, n.d. G)

According to NZZ am Sonntag (Jacquemart, 2011) it is time to move to Grisons because of tax reasons. However, it is not because of Grisons income or wealth taxes but due to its low *taxes on pension fund withdrawls*. Especially in the case of married couples, Grisons is within Switzerland one of the top cantons. Therefore, it could be worth for married couples to move to Grisons in case they consider to withdrawl their pension funds.

Rental rate: The price for rents varies within regions and type of municipality. Prices in ski resorts are for example much higher than the ones of similar communes whose focus does not lie on tourism (BFS, n.d. G). Moreover, Eastern Switzerland is much cheaper than Central Switzerland. Grisons itself has quite low rental rates except of the tourist regions. Obwalden then again has no tourist regions but is closer to the center of Switzerland. Hence, the canton is slightly below the average. (GR, n.d. H)

Economy

Taxes for legal entities: The population in Obwalden agreed to a tax submission in the end of 2005. Therefore, Obwalden had the lowest tax rate on profits in Switzerland starting January 2006. This led to a sharp increase in new registered companies in the canton. (Bachmann, 2006) Although Grisons offers some tax privileges to companies such as faster depreciation or tax reliefs, the canton is located around the Swiss average (GR, n.d. C).

Workplaces: In 1995, 64% of the employees in Grisons worked in the tertiary sector which was due to the cantons focus on tourism. 13 years later, this sector makes up for more than two third of the labor force in Grisons. The primary sector on the other hand has shrunk by more than 30%. As already stated earlier in chapter 2.2, this is because of the shrinking number of farms. Obwalden faced a similar decline in the work force of the primary sector. However, the secondary and tertiary sector grew a lot between 2005 and 2008. (BFS, n.d. D) The main reason for this incline in new working places and work force was the vote for the new tax system. Because of the low tax rate for companies, the number of companies in Obwalden and with it the number of employees increased a lot during the last five years. In Grisons both numbers decreased during 1995 and 2008 while there was a slight increase in Switzerland. (BFS, n.d. G) On Fig. 10 one can see the development in labor force for each sector in Obwalden and Grisons (see appendix).

Wage levels: In 2005, the average income in Switzerland was CHF 54'031. Grisons and Obwalden lagged behind the average with CHF 49'355 and CHF 39'646. (BFS, n.d. G) However, it needs to be taken into consideration that those information date back to 2005 and could be out of date by now. In a study of Credit Suisse, the average income growth rate was computed for each canton between 1999 and 2004. The growth rate of Obwalden and Switzerland was about 1.5% while Grisons could not reach one percent. (Maier, 2002)

Infrastructure

Accessibility of services: The BFS created an accessibility index of services – supermarkets, post offices, banks and so on - in 2001 on the basis of the business census. Switzerland as the average got rated by 100 and each region above 100 is not as good accessible as the average while each region below has a better accessibility of services than the average. A Swiss map illustrating the accessibility of services is pictured in the appendix (Fig. 11). All the regions in Grisons except Nordbünden (100,9) are way above the Swiss average. The regions with the worst accessibility rate of services are Engiadina Bassa (the worst accessibility rate in Switzerland with 620,3) and Surselva (390). Obwalden is with about 150 slightly above the Swiss average. Swiss cities such as Basel, Zürich or Lausanne have the lowest index value in Switzerland. (BFS, n.d. G)

Mobility and Accessibility: The accessibility of a region is an important factor of its attractiveness. To see how the mobility and accessibility of a region is, one calculates the travel time by public and private transportation from the region to the next city or center. Grisons regions are due to their mountains and valleys not as close to cities. Obwalden's advantage is that the canton is in the heart of Switzerland and therefore contiguous to bigger cities such as Luzern. (BFS, n.d. G)

Education: The labor market sets more and more higher educational requirements to their employees. Therefore, it is worth to know how many well educated inhabitants in a canton live. In 2007, the graduation rate in proportion to the population with the same age was in Switzerland 15.5%. Grisons graduation rate was with 15.6% insignificant higher than the average whereas Obwalden was the canton with the seventh highest rate (16.4%). (BFS, n.d. G)

Synopsis

After describing the relevant factors, the table below shows the ratings of Grisons and Obwalden for each factor as well as an overall rating for the two cantons.

Tab. 2: Comparative Analysis between Grisons and Obwalden

Characteristics	Grisons	Obwalden

Taxes for natural persons	0	-
Rental rate	+	+
Taxes for legal entities	+	++
# Workplaces	-	++
Wage levels	-	-
Accessibility of services	--	-
Mobility and Accessibility	--	0
Education	0	+
Overall attractiveness	**-**	**+**

Source: own illustration

Tab. 3: Rating table

++	One of the top cantons in Switzerland
+	Better than the Swiss average
0	Swiss average
-	Worse than the Swiss average
--	One of the worst cantons in Switzerland

Source: own illustration

Due to the bad accessibility of services and the mobility in Grisons, the canton gets rated with a "-" by the overall attractiveness. Nevertheless, it needs to be kept in mind that some areas just like Nordbünden are very attractive and that the rating is made for the entire canton. Obwalden got a positive ranking mainly because of the low taxes for legal entities and growing number of workplaces.

3 Forecast until 2030

It is generally known that the populace is getting older and more multicultural, but what does that mean specifically for the canton Grisons?

As stated in chapter 1.1, there is a rising concern in Grisons about then cantons future. Therefore, the topic about the demographic development of Grisons is not only present in the cantonal politics but also a key point in the planning activities of the canton. (ARE, 2007, p. 1)

The project team indicates in a first step three commonly discussed scenarios which are based on assumptions from the Federal Statistical Office (FSO) in Switzerland. These scenarios can be described as a “high scenario”, a “middle scenario” and a “low scenario” and are based on 2010 figures. The “Amt für Raumentwicklung Graubünden” (ARE) developed in 2007 also three scenarios. In 2010 however, their middle scenario did already differ by approximately 4’000 inhabitants below the actual figures. In 2030, the prognosis shows a population of 190’960, which Grisons has passed by now. Nevertheless, the team can use the high growth scenario from ARE which matches quite well with the middle one from the Federal Statistical Office in Switzerland and adds to the papers another statistic background. Howsoever, this distinction shows clearly how difficult it is to make a precise forecast.

In a second step, the team analyses in specific the “middle scenario” from the Federal Statistical Office in Switzerland combined with the “high scenario” from ARE and states effects the evolvement can have. The other two scenarios will not be analyzed because this would go beyond the scope of this paper and they are highly unlikely expected to take place.

3.1 Scenarios

Fig. 7 shows impressively how the growth of the canton Grisons can differ heavily if assumptions distinguish from each other. Nevertheless, it also indicates that the politicians still have the possibility to influence the development of Grisons future.

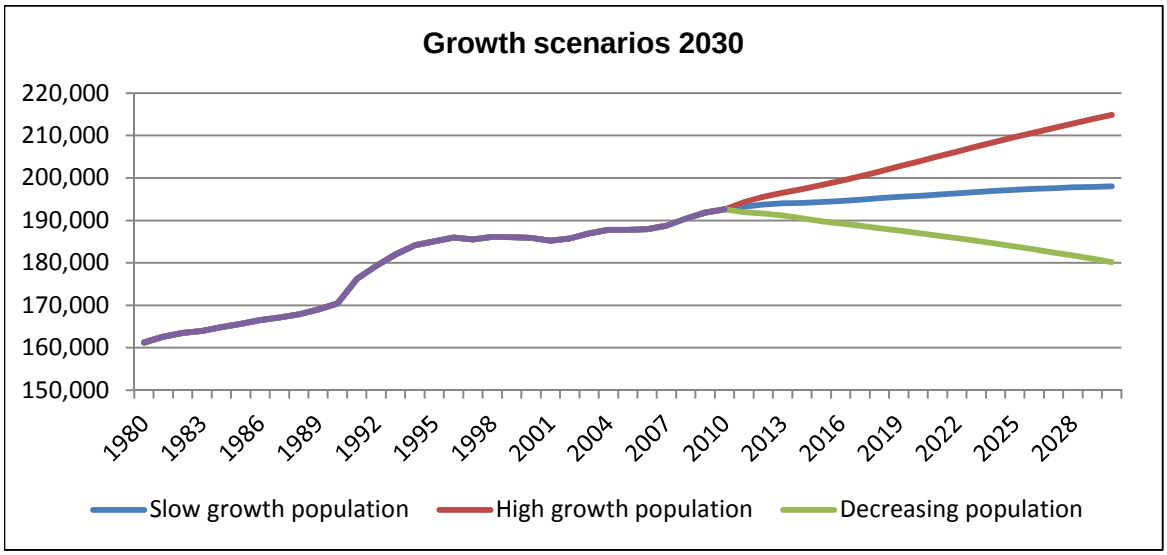


Fig. 7: Growth scenarios 2030. Source: own illustration based on: GR (n.d. A).

3.2 Low scenario – Depopulation

Assumptions

The migration of the last decade will not continue caused by political decision – immigration contingent – or by other development which decrease the attractiveness of Switzerland (e.g. overload of regulations, excessive price augmentation, etc.). Additionally, the intercantonal migration will decrease due to the movement of the labor to the centers and the agglomeration of the midland.

The fertility (currently 1.2 in canton Grisons, see analog Fig. 4) will based on a long-term trend stay on the current level or even further decrease and diminish the growth of the youth. (ARE, 2007, p. 3)

3.3 High scenario – High growth repopulation

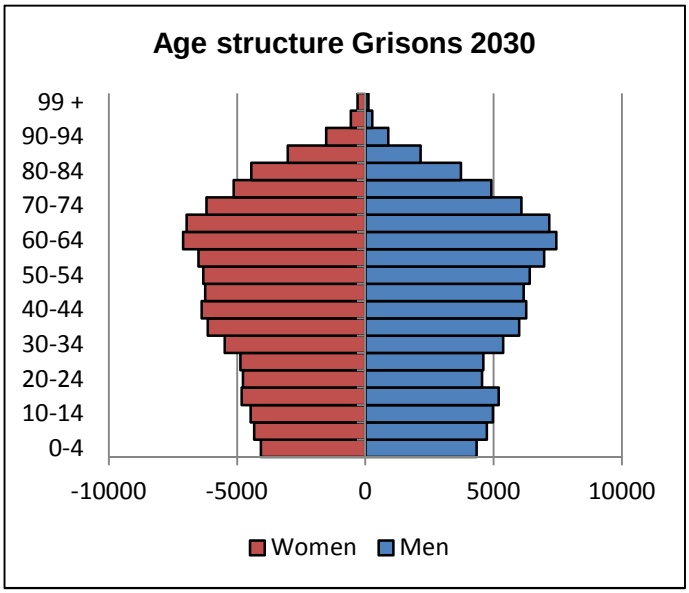
Assumptions

Switzerland will continue to open their frontiers and expand the agreement on the free movement of persons to future member of the EU and therefore have access to a vast labor force. In addition, Switzerland gains attractiveness thanks to their stability and low rate of unemployment. The canton Grisons profits of this evolvement due to its popularity a as retreat location.

The fertility rate (currently 1.2 in canton Grisons) will start to increase again, which has been observed in the last few years. (ARE, 2007, p. 3) This augments the population of the youth and the stability of the society structure.

3.4 Middle scenario – Slow growth repopulation

Assumptions



This forecast is based on general trends of the last decades of the canton Grisons and Switzerland.

The population growth will stay under the average of Switzerland for which several reasons can be identified. As mentioned above, the movement of young people to the centers and agglomerations is one reason and the fertility which is constantly below the average of Switzerland. The only reason why there is still a population growth, is the continuous migrations of foreign men and women.

Effects

Based on the above mentioned assumptions, this chapter describes some possible effects on the society structure, cantonal budget, economy, services and living space of Grisons.

Society structure

The age structure in Grisons in 2030 will look like the chart in Fig. 8. It changed from the notorious pyramid structure to a kind of an urn. This will have deep impacts on the cohabitation. The different aspect will be closer described in the following paragraphs.

How will it come to this urn form? From 2010 until 2030 the generation from 65 and above will have grown by 160% from 34'246 to 53'504 inhabitants, whereas the generation below 20 years and the generation between 20 and 64 will have decreased by about 10%. This is illustrated in Fig. 12 in the appendix. In percentage of the total population, the generation from 65 and above will represent 27% in 2030, while it was only 17% in 2010. The generation below 20 years will make only 17% in 2030 (21% in 2010) and the generation between 20 and 64 will decrease from 62% to 54%. Fig. 13 (see appendix) exhibits this development nicely. The reason for this development is the longevity and the influence of the lower fertility.

An analysis by sex and nationality does not show any noteworthy evolvement. The development is visualized in Fig. 14 in the appendix.

Another interesting figure which describes the new society structure is the aged dependency ratio. As already stated in chapter 0, it shows the relationship between the taxable workforce, who pays in our retirement and health system and the retirees, who draw a pension and burden the budget. (Trippel, Groth, 2011, p.4). In the canton Grisons, as well as in Switzerland and most of the EU countries, this ratio is decreasing worrying. In 2010, the ratio was about 3.5, which means that 3.5 people of today's workforce can bear the cost of one retiree. However, by 2030 the number will have decreased by 40% to approximately 2 persons. This development should lead us to a rethinking of our healthcare system, because it is not guaranteed that the working force can carry the burden sustainably.

Cantonal Budget

Due to an intercantonal dumping competition about taxes and a lower workforce, the tax volume is likely to decrease. On the other hand, according to ARE (2009a, p. 4) the per head expenditures on services for security, education, cultural and leisure time, infrastructure and environment are higher than in other selected cantons in Switzerland. Therefore, this leads to a higher gap between revenues and spending.

Economy

Urban regions: The high efforts in enhancing the educational infrastructure and selective investments in the High-tech business in Nordbünden will strengthen the economy. (Held & Schoder, 2010, p. 8)

Tourism regions: These regions can on one hand be affected by the shift to a more work-life balance in the society, which could enhance the demand for more leisure time and therefore the needs of holiday resorts. On the other hand, the income gap could further diverge and the cost of traveling to holiday resorts rises, which then diminishes the demand for them.

Rural regions: In the best case, these areas can maintain their current population size.

Services

The impact of the urbanization will continue and services like schools, post offices, corner shops and bus frequencies are further diminishing. This lowers the attractiveness of rural regions and the negative migration continuous.

Living space

In the past, the need for living space has increased steadily. This trend will continue so. In apartments where previously families with several kids lived are nowadays occupied by cou-

ples or even single households. This is because of the enhanced demands for living standards, smaller families and one- or two-person households.

In 2005, a person claimed on average 50m^2 housing space and it is expected that by 2030 the average need will be 57m^2 for Swiss and 55m^2 for foreigners. Under consideration of this development, the canton Grisons will have enough space for this elevated wants. However, it has to be kept in mind that this does not count for all regions in Grisons. Some tourism and agglomeration regions can come to their capacity limits. Nordbünden and Oberengadin have an expected population growth of 7.7% respectively 5.6% whereas Calanca (-23%), Poschiavo (-17%), Münstertal (-12%) or Bergeli (-11%) must take a decrease into account. The building land reserves in the canton Grisons hence decrease from 8'000'000 m^2 in 2010 to 6'000'000 m^2 in 2030. Nevertheless, it has to be considered that these are small regions and the forecast is therefore more likely to differ. (ARE, 2007, p 4-5)

To sum up, there is clearly a trend for growth in strong regions and a decrease in regions with a weak structure.

3.5 Conclusion

Chapter 3.4 introduced the scenario which is the most likely to take place. As mentioned above, this brings some negative effect with it such as lower tax revenues, a high dependency of retirees from taxable workforce or the disappearance of services in rural regions. To avoid further negative impacts, the team describes in chapter 4 some measurements for a prospering future of the canton Grisons.

4 Proposal: Healthy, wealthy and prospering Grisons 2030

For a prosperous future economic growth, Grisons needs to be innovative to enhance their regional attractiveness. The following chapter includes some possible measurements and ideas along various different areas.

In countries like Austria, France or Slovenia, development strategies for mountain areas are more proactive, targeting at a new mountain economy organized around the tourism industry, quality agricultural products and agro-tourism, transport facilities, and, in some cases, high-tech industries and activities in the service sector. Accessibility in general is a crucial condition for such developments. (NORDREGIO, 2004, p. 183)

Just like the analysis of mountain areas in Europe above suggested, the latest spatial planning of Grisons laid is focus on the four areas general, urban regions, tourism regions and rural regions. Therefore, the measures in chapter 4.2 are divided in these sections as well.

4.1 Key Issues

With the revision of the spatial planning, the canton Grisons has set the foundation stone for the future area development. Subsequently some aim and key issues are mentioned

General

- Actively develop and design easily accessible sites.
- Stop expansion of colonies into the nature
- More quality for the colony and countryside development.

Urban regions

- Focus on regions which are already well accessible like centers and road axes
- Stop further space expansion of agglomerations
- Implement traffic calming measurements to enhance living and environment quality

Tourism regions

- Better connection between tourism regions and enhance general accessibility
- Improve environment quality by enhancing public transport
- Strengthen the profile of tourism regions

Rural regions

- Improve sustainable usage of own resources

- Care of agriculture and forests
- Check requirements for usage of renewable energy

(ARE, 2009b, p. 52)

4.2 Possible Measures

General

For a region like the canton Grisons, international accessibility is crucial for future growth. Not only the expansion of the North-South axis is relevant, but also the East-West connection. The access to metropolitans, the Gotthard axis and the Rhätische Triangel need to be improved via extensions of public and private infrastructure. (ARE, 2009b, S. 31-32, S. 50)

Urban regions

Of particular importance for the perspective of the canton Grisons is the Nordbünden with its High-Tech companies. This is a cluster of companies which reaches from the Bodensee to the Bündner Rheintal and the Prättigau. As mentioned above, Nordbünden contributes nearly half of the GDP of the canton and therefore needs special attention. For the attractiveness of the location a large labor market with high educated worker is crucial. The support of the Universities of applied sciences is hence essential as well as the further upgrading of the infrastructure and the allocation of enough industry space. (Held & Schoder, 2010, p. 8)

Tourism regions

While Nordbünden depends on High-Tech companies, the regions Oberengadin, Unterengadin, Davos/Schanfigg und Mittelbünden on the other hand are depending strongly on tourism. The government is required to foster the innovation of the regions which can be most efficiently done by supporting the young academic generation. In competition to the University of applied science in Lucerne, the University of Applied Science in Chur needs to stand out and develop a competitive edge to attract more and more students. (Held & Schoder, 2010, p. 8)

Agrotourism

A recently launched administrative office in Berne is in charge for a better coordination and communication of agrotourism within Switzerland. Its aim is to provide services, structures and framework conditions for a better promotion of agro-tourism. In Switzerland some ideas already exist, like “sleeping in the straw” or “holidays on a farm”. The government of the canton Grisons wants to provide about CHF 1,38 million for projects like the one in Lenzerheide which is called “Kuhvilla”. (Krummenacher, 2011) This is a modern way of holding seminars in a farm environment but it offers also many other farm experiences. (Kuhvilla, n.d.)

Such innovative concepts must be further developed and can be expanded to a modern art of spending holidays, but instead of staying in a hotel, apartment or camping space, one spends his spare time on a farm. This kind of ideas are valuable to improve the location attractiveness of tourism regions.

Focus on elderly people

The drawback of the demographic change, the ageing in the society, can also be seen as an opportunity. The size of the elderly people is increasing, they usually have a high amount of free disposable income and they are healthier than the generation before. Those factors and their increased travel demand provide the tourism regions a huge potential. Therefore, regions should lay their strategy and marketing focus on those tourists. Hotels could benefit of demanding but also loyal customers. (Hotelleriesuise, 2010)

Visitor's tax

For the canton Grisons, tourism is the mainstay for future growth and prosperous. Therefore, the focus on tax adjustments should be based on the attraction of tourists.

One possible solution is reducing the visitor's tax, which diverges heavily within Switzerland. "Bündner Luft is teuer[75]", headlined the Swiss magazine Ktipp in 2003 and referred to the high visitors taxes in canton Grisons communities. (Diener, 2003) These differences have not yet changed dramatically. Usually, when a tourist – foreign or Swiss – spends his holiday in a Swiss hotel, holiday apartment or even on a campground, he needs to pay a visitor tax for using the infrastructure and services. The municipality itself typically decides on the height of the tax and is therefore a lever to apply. Some cantons in Switzerland go the other way and discuss about increasing the visitor's taxes. (Swissinfo, 2010)

Another way is to change the tax system for holiday apartment owners, what Andermatt has already done, namely from a per head tax to a flat tax system. In the canton Obwalden and Nidwalden the same topic is in the consultation process. (Nidwaldnerzeitung, 2011) The administration of the canton Grisons have also started to address themself to this topic. The possessor nowadays pays for the size of the apartment instead of per person. This should tempt the holder to rent the flat more often, which attracts more tourists to ski-regions and enhances the local demand. (Vinschgerwind, 2011) Nevertheless, the initiative does not always find audience and faces opposition mainly because of the expected negative price effect. Some owners need to pay a lot more if they do not rent their flat. This could lead to an emigration of current possesors. (Vogt, 2011)

[75] Grison's air is expensive

An additional possibility is a negative visitor's tax. Where the owner needs to pay for the days he either does not use or rent the apartment. This is another possible way to cure the cold bed problem.

Holiday resorts

The current discussion about the repeal of the "Lex Koller" – the informal name of the law which was introduced in 1996 to hamper the purchase of land and property by foreigner – could attract again more foreign investments. In combination with a rent obligation for the apartment, this evolvement would have a welcomed impact on the canton Grisons.

EURO-crisis measurements

The tourism sector tries to fight against the decreasing demand for tourism offers and launches different proactive projects. One of the projects is free ski passes for each night a tourist stays in a hotel. This measurement is mainly evolved due to the EURO crisis which affected the exchange rate dramatically. The free ski pass is not a new idea since several regions in Grisons have already implemented free summer passes for tourists. Other ideas are free ski schools if a family books a whole week in a ski resort. (Keller & Strohm, 2011)

Rural regions

The canton Grisons has a huge reserve of natural resource like energy, wood and cultivable areas. The government needs to launch medium to long term strategies how to sustainable exploit these resources. A big potential is the expansion of pumped-storage power plant whereas the further liberalization of the electricity market an important factor is. The production of energy from water plant gets steadily more attraction in today's debate about green energy production. The canton Grisons has the resources to play an important role in the future energy production. (Held & Schoder, 2010, p. 8)

Community based tourism

The concept is to alter the village into one big hotel in which the guests experience the lifestyle and traditions of the rural village and region. Vná, a village with 70 inhabitants from the canton Grisons started this project and made out of normal houses guest rooms. (Berghilfe, n.d.) An example for a combination of community based tourism and agrotourism is the project "Walserdorf Bosco Gurin 2011-2015". The little village from the canton Ticino experienced due to its population decline a financial distress. (Jankovsky, 2011) Therefore, the commune was forced to act. The aim of the project is to establish a territorial product "Walserdorf Boso Gurin", which includes agricultural, regional, tourism and cultural aspects. Subprojects are the brewery, the Pro Specie Rara-farm which offers bed&breakfast and farms which offer experience for tourists in the agriculture. (Bosco Gurin, n.d.)

Further measures

Further projects for rural regions are introduced on www.berghilfe.ch respectively in the "Jahrbuch der Schweizer Hotellerie 2010".

5 Conclusion

Demographic change has been a discussion for many years, all over the world and with thousands of different assumptions, effects and forecasts. The only thing which all have in common, none of them could predict the evolvement precisely enough. The challenge has ever been to choose the right assumptions to build a forecast. That is why such theses are usually designed with several different scenarios to cover a broad spectrum of possible developments.

Nevertheless, this paper tackled an even more difficult topic; it took a canton in Switzerland, compared it to a second one and analyzed the demographic changes they went through. The difficulty faced by the project team was the scarcity of information, figures and studies about those cantons regarding their growth and changes in society structures. On such a comparatively small area within Switzerland, Europe or even the World is it difficult to analyze causes and effects of alterations in society. To predict a future deployment is sheer inconceivable, as global impact amend the transformation on a large scale basis.

Nonetheless, the team tried to focus on characteristics which are tangible and influenceable on a daily political level. This is also the point the team would like to emphasize on. There are not only the global mega trends which form the future but the small steps each canton personalized in their inhabitants can take to tackle the challenges of tomorrow.

The key statement to get across is that the big path for social demographic change is driven of supranational countries, but the spectrum of ways to go can be written by each small village respectively canton itself.

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Appendix

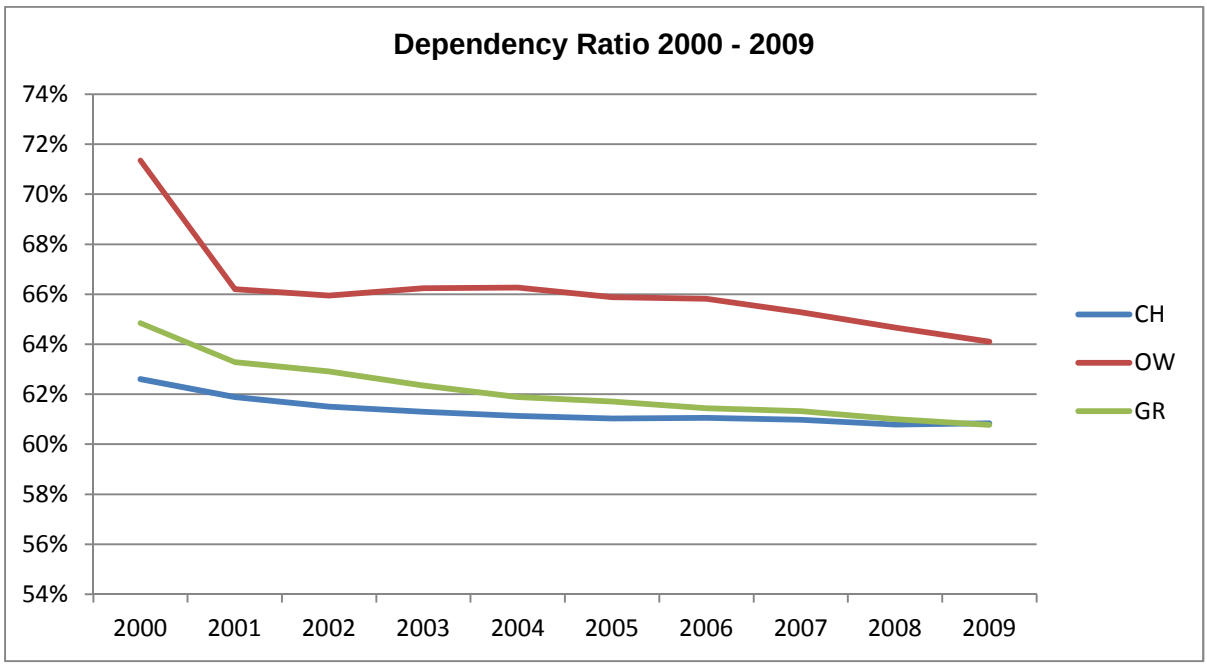

Fig. 9: Dependency Ratio 2000 – 2009. Source: own illustration based on BFS (n.d. E)

Tab. 4: Inverse aged dependency ratio

Year	CH	OW	GR
2000	4.0	4.2	4.0
2001	4.0	4.3	3.9
2002	4.0	4.3	3.8
2003	3.9	4.3	3.8
2004	3.9	4.2	3.8
2005	3.9	4.2	3.8
2006	3.8	4.1	3.7
2007	3.8	4.1	3.7
2008	3.8	4.1	3.6
2009	3.7	4.1	3.6

Source: own illustration based on BFS (n.d. E)

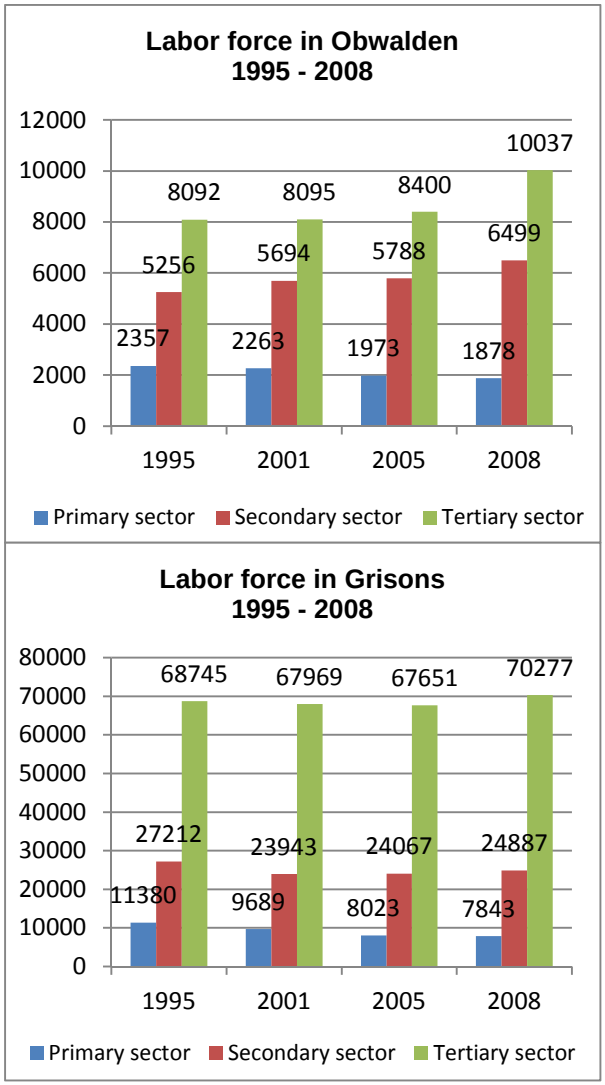

Fig. 10: Labor force in Obwalden and Grisons (1995 – 2008). Source: own illustration based on: BFS (n.d. D).

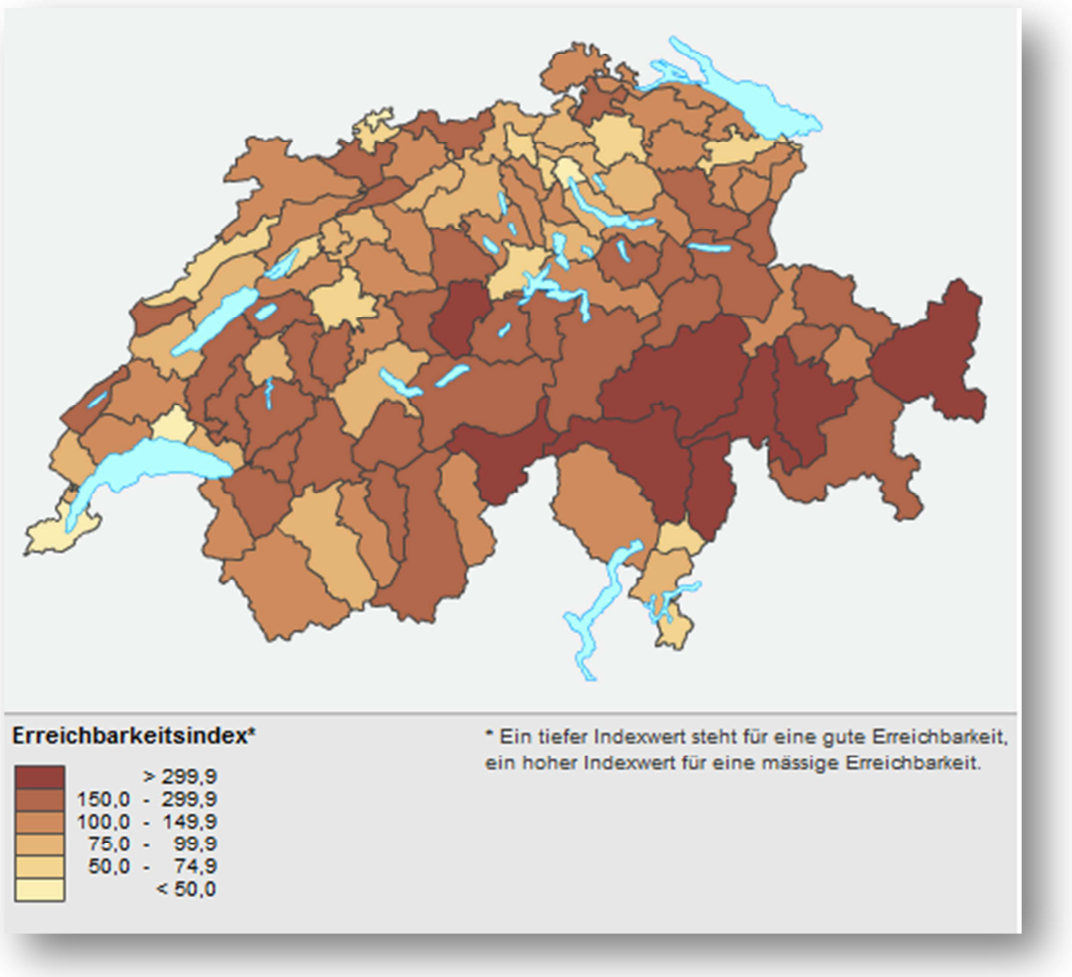

Fig. 11: Accessibility of services in 2001. Source: BFS (n.d. I)

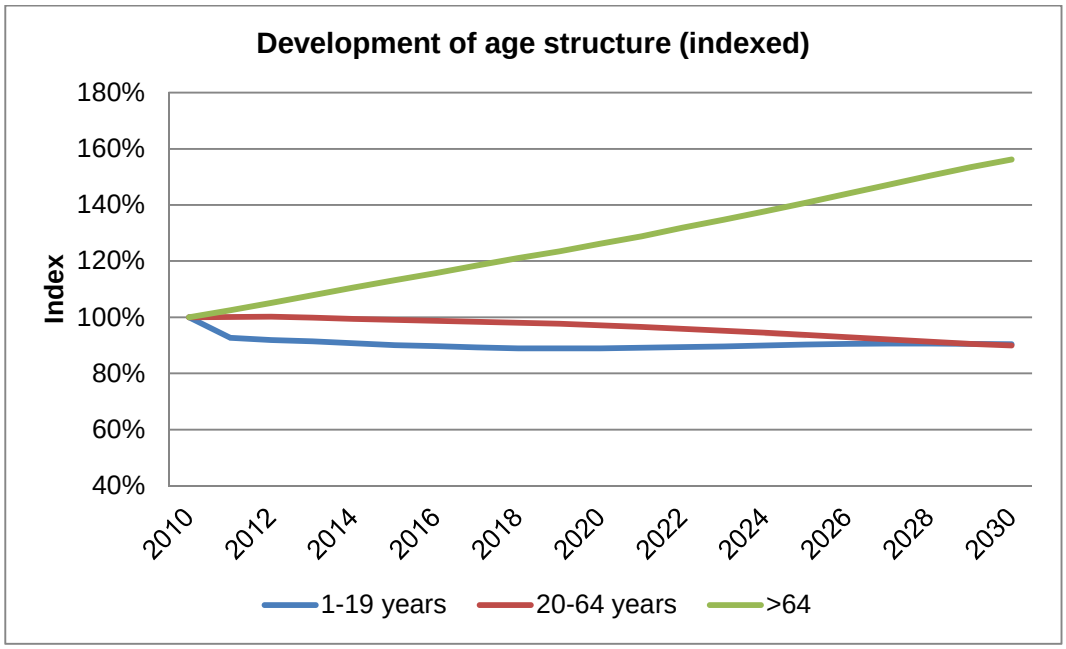

Fig. 12 Development of age structure in Grisons. Source: GR (n.d. A)

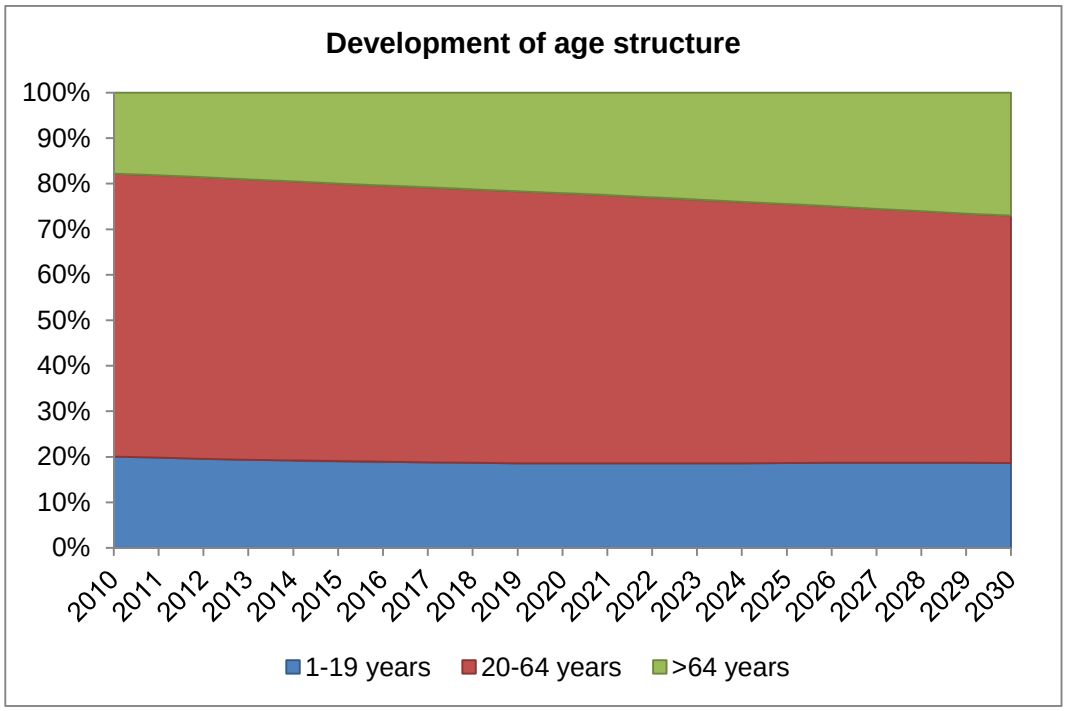

Fig. 13: Development of age structure in Grisons (absolut). Source: GR (n.d. A)

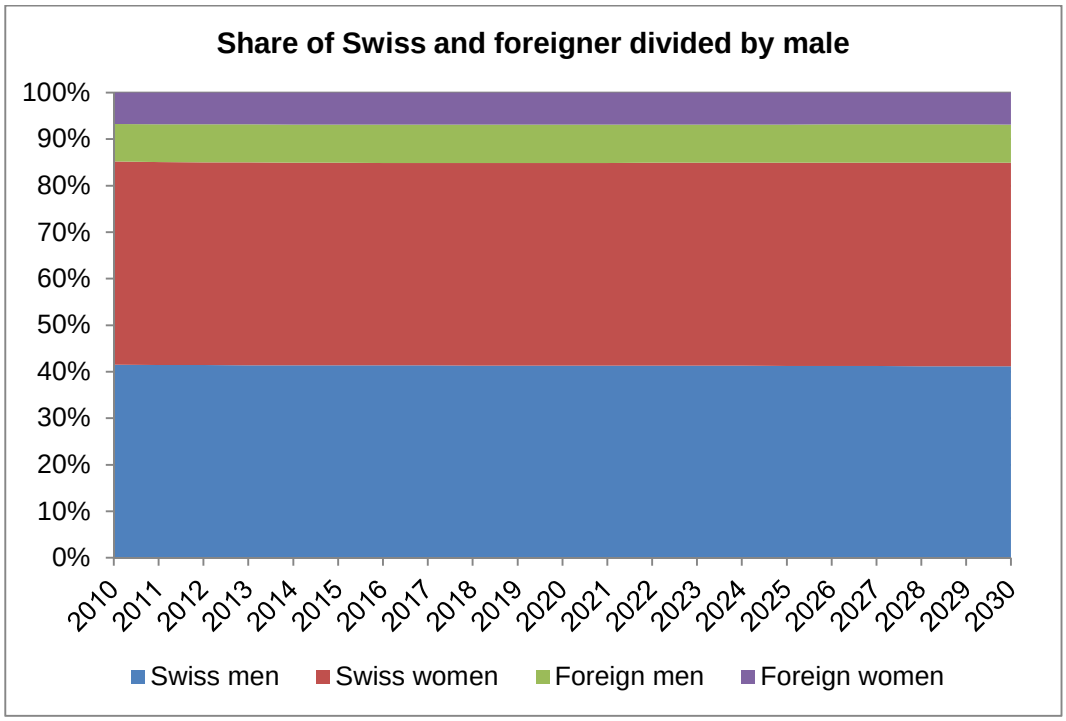

Fig. 14: Share of Swiss and foreigner divided by male. Source: GR (n.d. A)

Demography meets Europe

2012 - The European Year for Active Ageing

Mischa Delpy

Oliver Ivisic

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Megatrend 'Global Demographic Change': Tackling Business and Society Challenges in 2030 and Beyond

Dr. med. Hans Groth, MBA

November 2011

Management Summary

The European Commission has declared the year 2012 as the “European Year for Active Ageing.” This paper outlines a strategic framework with various implementation proposals for an active and healthy ageing society in Europe. The presented measures should be implemented in a rather fast and efficient way in order that they have a long-lasting effect in Europe.

In Europe several demographic challenges are expected to lie in front of us: higher life expectancy and lower fertility rates, which would eventually lead to a shrinking population and a much higher mean age in the years to come. Hence, the major challenges include rising expenses for health care systems and higher costs for public and private pension funds.

As a solution, the authors present a three-pillar strategy addressing the main points for the year 2012, which should be considered within an active and healthy ageing framework. This includes promoting healthy ageing, encouraging active citizenship and increasing intergenerational solidarity. In order to address the various issues, the authors suggest to create a number of “AHA” campaigns and events in order to ensure a common appearance for the various initiatives brought forward during the European year for Active Aging 2012.

Healthy ageing includes measures, which aim to reduce dependency on health care or related services. Moreover, it should promote more independent living standards both at home and in public. Active citizenship should encourage the senior generation to play a more active role in society in form of volunteers for an extended period of their lifetime. Lifelong learning initiatives are crucial measures to keep elderly people active and stay an integrated part of society. Through focusing on intergenerational solidarity mutual respect and mutual understanding of different age groups are intended to be increased. Age discrimination play, however, also an important role in the labour market, where our presented measures aim to increase the employability of older people and ensuring well financed pension and social systems for the future.

All those proposed measures are presented to the Commission of the European Union in form of a presentation on November 10, 2011.

Table of Content

1 Introduction

By announcing the year 2012 as the year for active ageing the European Union (EU) has already taken an important step - namely to put this predominant topic on the agenda for the near future. We believe that it is the responsibility not only of each member country to tackle these challenges but to put a framework of instruments in place, which may benefit the whole EU.

This paper aims to outline a possible strategy that the European Commission may bring into effect in the coming year. Beforehand, the manifold aspects of the European ageing problematic with regards to active ageing will be analysed in order to have a better understanding for the necessary steps to be taken within the next year. The various instruments to promote active ageing are then brought forward in a three-pillar strategy, which will be elaborated in part three of our work. We will highlight existing initiatives from both member countries and the EU in regards to active ageing and stress possible areas for improvement.

The EU has realized that in order to achieve its growth targets for the coming decade 2010-2020, it must foster and promote active ageing throughout the member states. Recent figures from the EU Demography Report indicate that the proportion of people who are surpassing the age of 80 will be growing most rapidly (European Commission, 2011a). We will also see a significant move in the proportion of people who are between 65 and 79 years old. While for the latter we have to identify enhanced integration possibilities in the working environment. The rising health care costs for the oldest may induce a significant burden for government budgets and society as a whole.

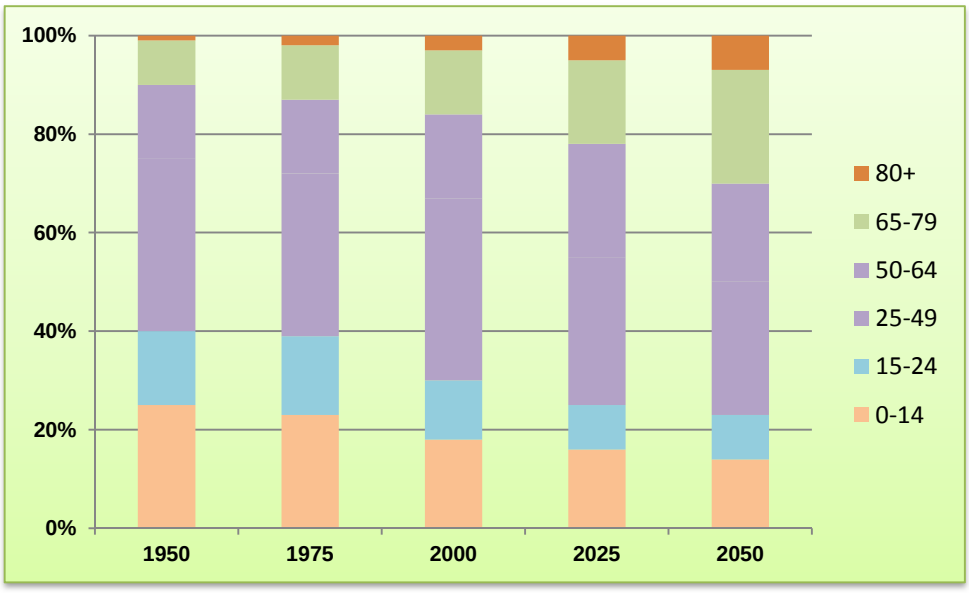
The term “Active Ageing” is most prominently associated with a “process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age” (WHO, 2002). In our further discussion we will concentrate on issues regarding health, participation and intergenerational solidarity.

Ageing as a European Problem

Population is seen as the major force behind demographic challenges. Therefore, current and future developments need to be carefully investigated. This part gives the reader an overview of various issues from a macroeconomic perspective. Although the political structures differ considerably at the local and federal levels, the EU enjoys political, legal and economic stability for decades.

The baby boomer generation is about to retire in these years with a peak by the end of this decade. This leads to an increasing percentage of elderly and retired people, and a shrinking workforce in the EU countries. According to the Demography Report published by the European Commission in April 2011, the percentage of the EU population aged above 65 increased from 13.7% in 1990 to 17.4% in 2010. The European Commission predicts that 30% of the EU population will be aged above 65 by 2060. Although these numbers are worrisome, we have to distinguish between different areas within the European countries since this 30% counts as an average number. The portion of elderly people is higher in specific rural areas whereas in urban areas, we count for less than half of the average of people aged above 65 (AGE Platform Europe, 2011).

Figure 6: Population Distribution in EU25 bye Age Group (1950 - 2050)



(Source: Authors, adapted from Hoffert, 2005)

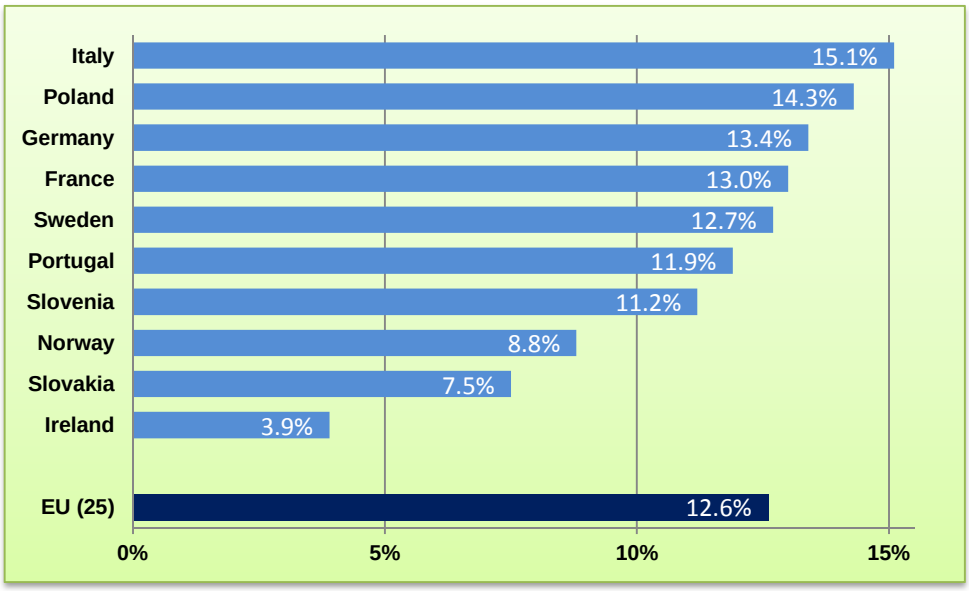
Improved living standards and health care as well as better medical services and enhanced nutrition lead to higher life expectancy (Trippel & Groth, 2011). Increased life expectancy implies that the proportion of ageing population aged above 80 is growing at an increased pace too. These elderly people have a disproportional need for public resources such as

increased health care and other services due to its decreased ability for caring on their own (U.S. Department of State, 2007).

The majority of the European countries experience the lowest fertility rates worldwide (Muenz, 2007). This observation is confirmed by Lorant (2005) who observed the most critical fertility and population growth rates in the developed countries of the EU. According to his findings, there is a high interrelation between “age of first birth and total fertility rate”. As more people strive for education and personal wealth, marriages are deferred, women bear a child at higher age and total fertility rates diminish. Additionally, Lorant proved that Europe was only able to compensate its diminishing population with an increased number of immigrants so far. This phenomena leads to a projected decreasing population between 2006 and 2030 in several EU countries such as Germany, Italy or Poland (U.S. Department of State, 2007). Eventually, the active labour force will shrink in ageing societies, which will make work more expensive and thus becomes more capital intensive (Cabrera & Malanowski, 2009). This may lead to a large flow of workers, capital and goods from the faster to the slower ageing countries, which can have a tremendous impact on European economies and labour markets.

More elderly people imply more health care needs and more medical consultations. Moreover, an ageing population will most likely increase public spending and put pressure on public pension funds and social plans. As those models came under pressure in recent years where the dependency ratio between the retirees and the workforce were already tightening, we are very likely to see challenges for those social systems in the near future as they represent a substantial part of GDP mainly in the largest economies in Europe (see Figure 2).

Figure 7: Pension Expenditures in the EU as a Percentage of GDP 2003



(Source: Authors, adapted from European Statistical System, 2007)

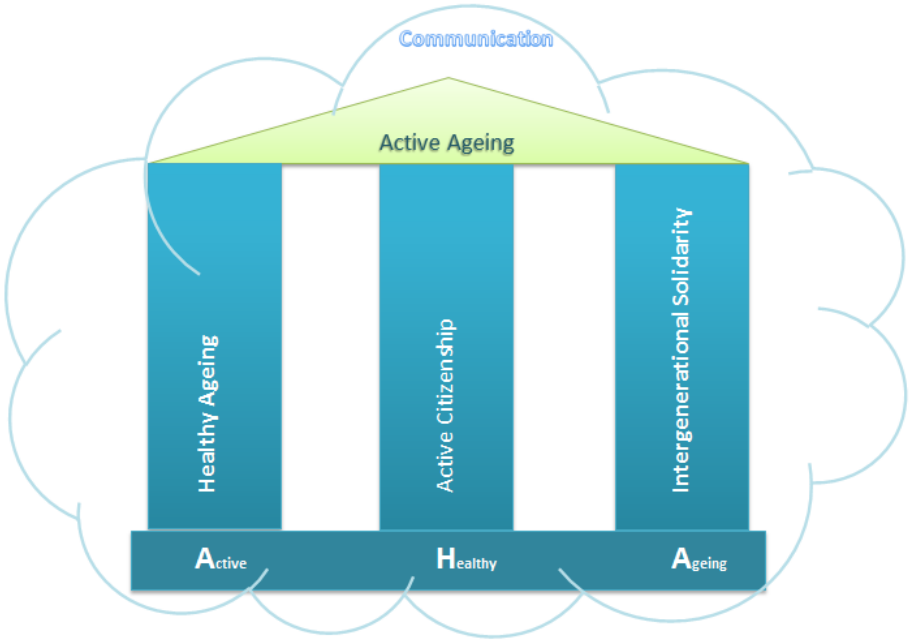
The use of resources is not only determined by the ageing society but also by the recent urbanization trend in Europe. More than half of the world's population live in urban areas whereas 75% of European citizens live in urban areas (European Urban Knowledge Network, 2010). This development has not stopped yet and reveals environmental and containment problems. Challenges for an ageing urban population are not only for natural resources and land use, but also for an adequate public infrastructure for elderly people. In line with the increased demand for mobility, current transportation systems and infrastructure are not adequate in all parts of Europe for an ageing population.

Overall, Europe faces an ageing population, which will pose major social and political challenges where the EU will certainly have to take a position as a role model and follow an unambiguous pattern.

2 Strategy Implementation

We base our strategy on three key areas, which should be addressed during the European Year for Active Ageing making sure it is both comprehensive and empowering.

Figure 8: AHA Three-Pillar Strategy



(Source: Authors)

We aim to implement a holistic strategy as illustrated in the above graph composed of healthy ageing, active citizenship and intergenerational solidarity as the main drivers for active ageing. The slogan “AHA” stands for Active and Healthy Ageing, which will serve as the communication and promotion strategy.

In a first step we will outline the goals of each pillar stating why we have selected them to be a driver for active ageing. We then continue by discussing in depth each of the identified key areas and present existing EU initiatives and projects. We will further deepen our discussion in this respect and elaborate on how active ageing can be enforced within the respective pillars. Attention will also be paid to possible pitfalls that policymakers could be faced with.

During the European Year for Active Ageing we propose to emphasize the three above-mentioned areas. While addressing our first pillar on healthy ageing, we aim to promote health prevention across Europe. Remaining healthy and therefore more independent are crucial factors for being active at higher ages. At the same time, the initiatives taken in the

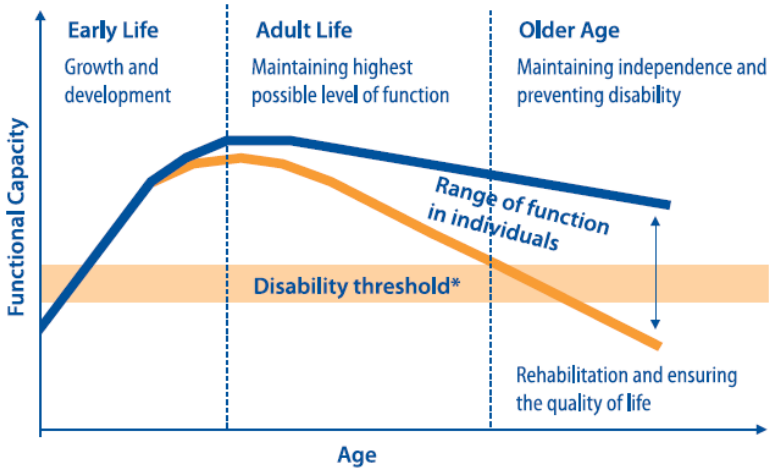
coming year should also spread the word for more individual responsibility of one's health. The second pillar in our strategy discusses active citizenship. Within this area we want to encourage policy makers to form an environment that promotes volunteering as well as life-long learning among aged citizens. Lastly, within the field of intergenerational solidarity we believe that active ageing can only be achieved when age discrimination is reduced since both sides may benefit from an active dialogue. Finally, social security systems need to be funded on a sound basis, ensuring that our senior generation can rely up to a certain extent on this income.

We believe that one should focus on selected topics during the next year since it is not feasible to introduce a new EU wide health care system. However, the EU should focus on conveying the main message to all stakeholders involved. The communication "cloud" in figure X should reflect on this idea. Therefore, by using a simple term such as "AHA" we try to consolidate our ideas and create a common appearance. The term "AHA" has already been introduced by the European Commission (2011b) but was not yet put in practice. It is self-explanatory that some of the issues discussed in the respective pillars may be interlinked with one or the other field. Therefore, the allocation of our sub-topics to a particular field should not be seen as definitive.

Healthy Ageing

As people get older they are demanding more and more health care services. It is therefore inevitable to promote possible solutions for healthy ageing if we want to ensure universal health care access across Europe. If the senior generation can remain healthy for an extended time period it implies that they can enjoy on the one hand a far more independent life and on the other hand health care expenditures can be deferred and hopefully reduced. Figure 4 by Kalache & Kickbush (1997) highlights this idea.

Figure 9: Maintaining Functional Capacity over the Life Course



(Source: Kalache & Kickbush, 1997)

Disability threshold as shown in the above illustration refers to the point in time where people are no longer able to care for themselves. Obviously, the goal of active (healthy) ageing is to lower this threshold. As observed above this can only be achieved by lowering dependency, which in fact means promoting an independent lifestyle for the senior generation. Over the course of the European Year for Active Ageing we therefore introduce possible measures and instruments to achieve this goal. The AGE Platform Europe (2011) has put forward selected fields that should be reinforced when tackling healthy ageing. Those suggestions will serve as a guideline for our discussion in the following pages.

In general, we point out the importance of a healthy lifestyle. A possibly effective tool to raise the awareness in this respect would be to start an advertising campaign with “AHA-Celebrities.” Each member state should be encouraged to select a popular senior person and invite him/her to share their experiences of an active and healthy lifestyle.

Reduce Dependency

Dependency should be tackled by prevention. The rise in chronic disease in connection to an ageing population is seen as one of the major upcoming challenges (Economist Intelligence Unit, 2011). Major and chronic diseases (MCD) as defined by the European Commission (2011c) include cardiovascular disease, cancer and diabetes amongst others. It is furthermore suggested that at least 80% of all these illnesses are preventable (Economist Intelligence Unit, 2011). This paragraph mainly deals with open questions on how these diseases may be reduced. We see two major ways how this problem may be tackled. On the one hand, health promotion should be enforced and on the other hand the EU has the task to create a favourable environment for the researching and business community in order to ensure continuous innovation. Within our strategy we will restrict our discussion on health promotion. We believe that the main goal of the European Year for Active Ageing is to target the people affected and less about the business community even though they also play a major role (e.g. development of new drugs).

There are a number of issues ranging from health literacy and vaccination to home visits, which should be considered in respect to health promotion. Health promotion is only effective if people can understand the possible consequences of chronic diseases. Since health literacy is lower among older age groups, consequences can be severe (Swedish National Institute of Public Health, 2006). It is therefore suggested by the Swedish researchers that people with a lower literacy level are more likely to refrain from vaccinations or cancer screenings. Furthermore, it is stated that influenza vaccination may “reduce hospitalization for heart diseases” and various other illnesses. Home visits may also account for an effective tool in order to foster health promotion. By offering basic health care services at home, the senior generation can enjoy a far more independent life. Consequently, health care resources can be used more efficiently.

Within the EU health strategy key issues such as vaccinations are already addressed widely. However, we feel that they are not yet focused enough on active ageing. The same applies for health literacy that is yet to be tackled. The University of Maastricht (2011) is currently conducting the first “European Health Literacy Survey” (HLS-EU) in order to gather comprehensive data throughout the Union.

Within the next year, it should be the goal of the EU to elucidate the European population about the wide benefits of vaccinations. EU-wide “AHA-Vaccination Days” may be a first step towards achieving these goals. In order to have the best possible effects, we suggest

holding such events in a selected number of big cities in each member state. Preceding advertising campaigns inviting people to receive a vaccination free of charge should help to mobilize the senior generation to attend such events. Additional health services and information may be provided during such events aiming to increase health literacy. One could argue that only a small number of people living in urban areas are targeted by public vaccination days. However, we believe that the overall public awareness through media reports outweigh these disadvantages since the main goal is to convey a positive message for vaccinations. Engaging in partnerships with pharmaceutical companies may reduce possible cost constraints. The EU should set incentives for the private sector by making future research grants conditional on participating at such events.

With regards to improving health literacy, Sweden could be taken as a role model since they implemented “FASS”, an easy to use medical information platform (LIF, 2011). In order to ensure that information is accessible to the senior generation, one has to include different communication channels (phone, internet, books etc.). The Swedish model is in this respect very advanced and European policy makers are currently discussing whether this service should be offered by private organizations (as in Sweden) or by public authorities. We believe that such information platforms should be operated in a joint partnership between the industry and the public authorities. One should ensure that there is not an “overflow” of information and that industry organizations do not tend to promote new drugs, which might only be to the benefit of the private sector. Whether health literacy can be enhanced among people who are currently already at an advanced age seems questionable. Therefore, it should be rather the goal to educate younger generations and make them familiar with the needs of the senior generation to whom they look after. Essentially, it means that children or grandchildren of senior citizens should be the main target audience of such projects. Whereas for grandchildren the school may play an important role (e.g. AHA-School-Events), it might be more difficult to reach the mid-aged generation. Nevertheless, we believe that health portals on the internet will be the most (cost-) effective tool for countries possessing the relevant technological infrastructure.

Support Independent Living

Interesting projects brought forward by the AGE Platform Europe (2011) include the introduction of sophisticated “home-based ICT solutions.” While simple alarm buttons for old people are already widespread in various developed countries, the suggested instruments reach a far new dimension.

One of the most comprehensive projects is the “inCASA” initiative, which was introduced in 2010 by the European Commission (inCasa, 2011). Its “360 degree” approach covers a wide range of monitoring tools that should enable elderly people to safely enjoy their independent life at home. The benefits are manifold. On the one hand, clinical tele-monitoring may bring about increased efficiency for the health care environment but on the other hand it could also facilitate the daily life for the older generation. Since inCasa has been promoted only in selected European regions up to now, we would encourage the EU to present this initiative to a wide public throughout the year of 2012. There exist a wide number of similar projects. Some of them even aim to motivate people to engage in some kind of dialogue with these electronic devices. The project initiators are expecting to stimulate brain activities in such a way that the seniors remain an active group of people (AGE Platform Europe, 2011).

Even though ICT solutions will certainly play a major role for the older generation in the future, one also has to be aware of the drawbacks that may come along. Since the main goal of the above mentioned projects is to provide more independence it may have the effect that people tend to grow lonely if they rely too much on these electronic devices. Therefore, it is essential that those instruments do not only monitor but also encourage people to leave their homes and participate actively in our society. Technology alone as suggested by the Economist Intelligence Unit (2011,) is not going to stop spreading severe chronic diseases. It is more likely that technology can foster prevention. Policymakers in charge of active ageing should team up with their colleagues who are in charge of the “Digital Agenda for Europe.” This project aims to foster the access to information technologies throughout Europe (European Commission, 2011d). It is therefore essential that the interests of the senior generations are represented to a large extent in order to make a step for an improved active ageing.

Access to Transportation and Physical Infrastructure

Since 80% of the senior people already live in urban areas the access to public transportation plays a key role if one wants to promote active ageing (Beard & Petitot, 2010). Seniors can stay active for a far longer time horizon if they can move independently. They may not be able to drive a car by themselves. However, they still want to work or volunteer for an organization. Therefore, not only the existence of public transportation is a necessity, but far more important are adequately designed transportation vehicles. If there exist barriers, which may not enable the senior population to use public transportation, they may instead stay isolated and cannot any longer take actively part in the society.

Walker (2009) supports the idea of “life-long neighbourhoods.” Since an increasing number of old people live independently, there is a need for a redesign of our neighbourhoods. Active ageing indeed wants to promote the idea of staying at home as long as possible. However, we have to enable the senior generation to really do that. Possible ways are the introduction of building standards (height of stairs), which should ensure the usability for older people. Such practical and easy to implement issues would help towards a better integration of our senior generation.

With regards to the public transportation system and the corresponding needs of older people, we would like to highlight the organization “Aptie” (Accessible Public Transport in Europe), which is funded by the EU (Aptie, 2011). Since it is our impression that the public transportation standards vary significantly throughout Europe, we believe that the main task of the EU is to provide advice to local authorities, which are finally in charge of implementing the transportation solutions. An exchange of good practice is therefore seen as essential. The most critical points to consider are probably the ticketing systems, which should be designed in a manner that encourages older people to use a bus or a train. Furthermore, a “level access”, which allows people to board a public transportation without big hassles, seems to be crucial (Aptie, 2011).

In the European Year for Active Ageing, we suggest to invite selected policymakers to virtually experience what is meant by accessible transportation systems in reality. The “AHA-Transportation Conference” should therefore enforce knowledge transfer and be held in a country that could serve as a role model for the whole Union. Switzerland would be certainly a candidate in this respect.

Active Citizenship

On the European level active citizenship is not only seen as a strategy in order to guarantee aged people’s participation in the society, it is also an approach with the aim of bringing European diverse cultures politically and socially closer together (Mascherini et al., 2009).

This part focuses on ideas and concepts as of how European senior residents could perform an active role in the society and in this way significantly contribute to a sustainable development as well as increase the awareness of the younger population. We will present two main aspects of active citizenship.

Volunteering

Volunteering is basically seen as a form of non-paid and unforced effort. In this way, people have the possibility to contribute actively to the wealth of a country and community. Therefore, senior volunteering is a substantial part of active ageing which also part of the European Year 2012 (AGE Platform Europe, 2011).

With the purpose of encouraging volunteer effort, the European Volunteer Centre was established in 1990 (CEV, 2011). This is a platform for European volunteer centres and volunteer support agencies. In response to senior volunteering the CEV launched the project “Think Future – Volunteer Together” from 2007 to 2009 where volunteering possibilities were brought closer to elderly persons. The CEV is also a member of the Platform of European Social NGOs (Social Platform) and the International Association for Volunteer Effort (IAVE).

Considering the fact that the aged population is growing at an increasing pace and looking at the ageing problematic from a cost perspective, it is obvious that there will be an increased number of people who require help and financial resources from the younger generations. However, one could also argue that the augmented senior population is a new form of resource, which is able to share its “wealth of knowledge and experience, time and energy” with the rest of the society (AGE Platform Europe, 2011).

First of all, we would like to highlight that any volunteering initiatives related to the European Year for Active Ageing 2012 needs to be appreciated by the principals. We predict an immediate dissatisfaction among elderly people if a certain sign of gratitude is not assured. The 2012 Olympic Games in London are an excellent platform for promoting senior volunteering. Therefore, we suggest that the organizing committee of the European Year for Active Ageing approaches the Olympic committee. We aim to make the benefits of volunteering public to the general audience. Accordingly, the idea of senior volunteering should be brought forward under the campaign name “AHA Olympic Volunteering”.

Lifelong Learning

Senior people are not only confronted with health issues but they also recognize that certain physical and mental capabilities decline over time and therefore lifelong learning becomes essential. Merz & Nordstorm (2006) indicate several reasons in the book “Learning Later, Living Greater” why education at high age is of importance for the society in general as well as for each elderly person. They define education as the cause of for instance increased

flexibility meaning that people adapt easier to changes and participation so that they actively contribute to the society.

In order to foster continuous learning the EU has assured a budget of EUR 7 billion for 2007 to 2013 for the “Lifelong Learning Programme” (European Commission, 2011e). The programme consists of specific actions and four different approaches: “Comenius for schools”, which considers the youth population, “Erasmus for higher education”, which focuses on student’s needs, “Leonardo Da Vinci for vocational education and training” in order to improve cohesion and comprehension in the EU, and “Grundtvig for adult education”. We perceive the project Grundtvig which was launched in 2000 as most relevant for the European Year for Active Ageing because it does not only pool elderly people but it also considers learning institutions and their teachers (European Commission, 2007). It also strives towards meeting elderly people’s educational needs through so-called “Grundtvig Learning Partnerships”. Therefore, we stress the importance of the CASCADE project which focuses on adult early school leavers and aims to make education institutions aware of reasons why grown up people do not strive for alternative education. We suggest that CASCADE should serve as a basis for another project which is specifically designed for the need of senior citizens due to the fact that often older citizen's demand for learning is neglected by the policy makers. According to McNair (2009) in the past the focus was more on "health and social care policy" related to aged citizens and not at all on education. We strongly suggest that barriers for learning and senior educational needs have to be understood by the institutions as well as political leaders in order to set the right incentives and to be able to improve the access to teaching organizations.

At the beginning of the project an in-depth analysis is necessary. Hence, we suggest that representatives of older generations, e.g. Merz & Nordstorm, share their thoughts with politicians and directors of education organizations as early as possible. The purpose of the meeting is to identify elderly needs, opportunities and potential adjustments of the adult education system. As soon as information is collected the EU should target in a first step known organisations of adult education in order to make the idea of “AHA Adult Education Access” public.

In addition to this project, we propose to teach older generations how to access the internet with the purpose of lowering digital divide in Europe, which means decreasing “the gap between those who use digital technologies and those who do not understand” (Hargittai, 2003). From 2002 to 2005, the EU has already implemented a project called EuCoNet where seniors learnt using ICT tools (EuCoNet, year unknown). For that reason, the EU should

again launch such a project during the next year under the name of “AHA Pro Digital Unity”. Throughout the lifelong learning projects the EU was able to build a large network of people and institutions, which now can be approached. We think it is necessary that the content of teaching lessons should be based on the needs of senior citizens and that only basics should be taught. Additionally, the EU should implement the “AHA Pro Digital Unity” project in Sweden, Germany, Italy and Spain in 2012 which will serve as pilot project for a European wide strategy during the next few years.

Inter-Generational Solidarity

A continued involvement in societies and communities seems to be challenging for older people, and becomes more challenging as they age (AGE Platform Europe, 2011). The EU aims to enhance the interaction between different age groups with various initiatives. Due to the fact that demographic changes will have a tremendous impact on people of different age classes in Europe, we see the interaction between different age classes as an important part of the European Active Ageing strategy.

Age Discrimination

The discrepancy between the young and old generation manifests in various areas. Within societies, there is generally a lack of natural opportunities for different ages in a generation to meet and exchange ideas or opinions (AGE Platform Europe, 2011). The EU started initiatives where regional and local government organizations are providing education and training programs, which enhance inter-generational solidarity. These initiatives may not only be a chance for transfer of knowledge but is also an opportunity to enhance mutual understanding and relationship building between generations (AGE Platform Europe, 2011). A promising project that has been put in place is HEAR ME, where educated retirees are assigned as mentors to school leavers aged between 15 and 25. As the main goal of this project is to use their knowledge and experience to make a social contribution, this may not only enhance mutual understanding between different generations but the elderly can also teach unique skills and advice according to their life experience.

To implement such a project across European countries, the education leaders should agree upon a European-wide project in order to approach schools and retirees locally for building such a network. A practical way of implementing such a mentoring strategy would be to approach universities as they usually enjoy high number of alumni. Retired alumni should be approached in order to organize workshops and as a tool to promote the AHA Mentoring. A

roadmap should focus on approaching various leading universities across Europe, where one day per month one university is approached (see the example below):

January 2012: University of St. Gallen ,University of Zurich (Switzerland)
February 2012: Rotterdam Erasmus University (Netherlands)
March 2012: HEC Paris (France)

At the initiation of those projects, basic information courses will have to be given to the mentors in order to transmit the coaching idea. We think, however, that courses on how to structure mentoring sessions (as proposed by the HEAR ME project) are not a prerequisite.

Although few objections might be expected on a political level, it still might take a considerable amount of time to convince national and regional decision makers to implement such a program. Apart from the main strategic aim, we think that this project will have side benefits such as the creation of an informal bond between a mentor and a mentee from different ages that may go way beyond the initial goals.

For a successful and long-lasting prevention of age discrimination, the program should define clear guidelines and make suggestions on frequency and content of mentoring sessions. Furthermore, it should be implemented in a way that mentors are members of a mentoring network in their cities or of their universities. With this measure, new members can easily be acquired and new information can be spread fast.

Although it might be difficult to monitor content and frequency of mentoring sessions, and might differ from region to region, we think it could be a potentially worthwhile project to undertake because once it is implemented among different regions and language areas, there is no centralization needed to maintain those programs.

Redesign of Labour Market

Age discrimination is present in the labour market too. For instance, younger people feel that they have to take care for social systems and long-term care that benefit the older people and old people feel under pressure to go in early retirement by the young generation (AGE Platform Europe, 2011). Although skills should be valued more than age, a common discrimination in hiring can be observed among various companies (Walker, 2009a). Moreover, older people are less likely to be trained refreshing core skills relevant to their employers than younger people. While in general the working population is expected to become older

and eventually shrink by 50 million until 2060 in the EU, there is a need to keep older employees in the workforce too (Muenz, 2007).

The Commission of the EU points out that the older workforce possesses skills and working experiences that are crucial to the labour market and companies (AGE Platform Europe, 2011). This potential should be unleashed. Labour market is a crucial factor for active ageing because a future growing economy and increased profitability are only achievable with higher productivity and a sufficient supply of workers to companies. The main instruments to achieve this are to secure sufficient employees through immigration, rising retirement age, and higher labour force participation by women (Muenz, 2007).

Encouraging people to stay in employment does, however, need to be tailored according to their physical ability and health status. Working places would have to be updated to conditions for people aged 60 and above. Moreover, a better access to lifelong learning programs and a stimulating rewarding system for older workers would be important success factors to encourage people to work (productively) 5 or 10 years longer. An important factor for promoting longer employment is healthy ageing (Swedish National Institute of Public Health, 2006), which was already discussed in part 3.1.

According to Walker (2009), an abolishment of a strict retirement age around 65 may not only improve individual income situation after age 65 but it will also contribute to a more robustly financed pensions systems, which may make radical pension system reforms redundant. We will go more into detail on this point in part 3.3.3.

One of the projects that we want to highlight is Pedagogy assisting workforce transitions (PAWT), which aims to teach skills needed for elder workforce such as IT skills in order to ensure a higher employability of older people. With a budget of 400’000 Euro it is clearly just a start for implementing a Europe-wide training program of the older workforce. Moreover, companies should be encouraged to plan enhanced employee development programmes with higher intensity for employees older than 50.

Further projects that we want to highlight are “PEOPLE - Pan European Older People’s Learning and Employment network” and “FIFTI - for a new professional dynamic after 45”. They are not only career development oriented but also on how to promote older workforce in companies.

In order to promote such a cross-regional program, it is crucial to convince leaders from the private industry that older workers above 50 years can be of high worth. We suggest using a platform such as the WEF that targets leaders of the private industry in order to promote such a campaign to the intended target group. We think that employing older employees is not only from an economic standpoint an important strategic decision, but it may also stand for a thorough CSR (Corporate Social Responsibility). Companies that do especially well should be given awards (AHA Accomplishment Awards) for being firms that support older workforce.

From our point of view it is absolutely crucial that the private and the public sector realize how older people are a key asset to them because they are more experienced and can work more flexibly than younger workers (part time). Training those employees can be highly beneficial to the economy, because of profitability and efficiency improvements by using older employees. Finally, a more flexible work schedule would allow companies to make more efficient use of older workers. Overall, it can be said that companies need to learn how to judge on skills and competences and not on age.

Social Systems

As elaborated in part 2, social systems represent a substantial part of GDP. On average 12.6% of GDP is currently spent among the EU countries for pension systems with an increasing cost trend.

Pension systems were created in an era where life expectancy was much lower and lifelong employment common (Walker, 2002). As these models were based around the assumption that the current working population is much higher than the number of retirees, the pension systems seem to come under serious financing problems in the years to come. Walker further points out that today's social systems have not adapted to increasing trends of the labour force. For instance, working longer than the retirement age does not provide incentives neither for the employee nor the employer.

Several debates have been started within the EU commission and within EU countries. A joint conclusion is that pension systems have to be maintained but cannot be based on the same models as in the past as lower fertility rates and higher life expectancy will fundamentally threaten the current pension system.

We think that the ultimate way to keep pension systems healthy financed, is to increase retirement age in the coming years. In order to prepare society and the private sector, employees should be given the opportunity to work longer in the short run that gives at the same time an incentive to continue working after their retirement age.

Conclusion

To declare year 2012 as the European Year for Active Ageing is an important step to propose solutions for the European challenge of demographic changes.

Diminishing fertility rates and higher life expectancy among others leads the European Commission to predict an increase to 30 % of the EU population aged above 65 by 2060. This will have a tremendous impact on infrastructure needs, transportation systems, labour market and the funding of social systems.

With the purpose of insuring healthy ageing increased health literacy leads to a reduced dependency level. Technology enables elderly to enjoy a longer independent live. Active citizenship gives senior people a sense of importance through volunteering activities and gives them access to the society through lifelong learning. The quality of life of elderly people can significantly be improved if age discrimination of any kind is avoided and possibilities for employment of older workers are facilitated by flexible retirement.

To successfully address the aspects of healthy ageing, active citizenship and intergenerational solidarity we proposed the AHA communication strategy throughout this work in order to effectively reach the relevant stakeholders across Europe.

The EU has the political and financial power to provide incentives, which influence people's behaviour effectively. It is also necessary to consider healthy ageing, active citizenship and intergenerational solidarity not only as a possibility or right of each European citizen; it should be understood as a responsibility in order to preserve wealth and prosperity in Europe.

The authors are confident that the presented projects in this paper and our subsequent recommendations on their execution will have a sustainable effect to solve the demographic challenges in Europe.

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Demography meets the Office Space

How should different generations work together productively and longer?

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Megatrend 'Global Demographic Change': Tackling
Business and Society Challenges in 2030 and Beyond
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Executive Summary

This paper discusses the demographic challenges in the office space. Population ageing, low fertility rates and increased migration are responsible for a large demographic shift. The paper investigates general demographic trends in Western Europe and the US. The main argument is that mature employees are important and that their potential and benefits are underestimated by institutions. To evaluate this proposition, the authors first reflect motivational aspects of retirement eligible employees and compare them to those of the employers. It then presents opportunities to mitigate the impending demographic problems by concentrating on two different levels. On the firm level, the authors identify recruiting strategies, appropriate work environment, organization, career development and lifelong learning as appropriate measures. Whereas feminization of the workforce, immigration and a paradigm change in society are proposed on the governmental level. With help of these recommendations, companies can take the appropriate steps to retain valuable employees and continuously increase the productivity of their labor force. These policies changes will support tackling the demographic challenge in the office space and enable future growth and prosperity of the economy.

Table of Contents

Table of Figures

Introduction

US presidential candidate Rick Perry compared the social security system of America to a modern Ponzi scheme (Tanner, 2011). This comment has had a large echo questioning the systems' long-term viability. It is not just about the longevity of the population, rather the combination of decreasing fertility rates, better health conditions and longevity, which have led to the demographic challenge. While approximately 16 workers were paying taxes to support a retiree in America in 1950, there are only three in 2010. (Tanner, 2011) The weight the current workforce is carrying will only become heavier as the population grows older. It will therefore be questionable whether todays' social security investors will be able to receive a fair yield in future. This demographic development will take place in most mature economies. The retirement of the baby boom generation will result in a mass exodus of human capital within the upcoming decades. (Little & Triest, 2001 and Fotakis, 2000) Fotakis (2000) further emphasizes the importance of this irreversible trend within the foreseeable future and the incumbent increasing risk of imbalances in the financing of the social protection.

This paper will focus on the implications of this trend in the office space. It is of vital essence to a growing economy to continuously increase the absolute number of the labor force. The impending retirement wave is however highly conflicting with this economic goal. As a consequence, there will be skill shortage and with that a lot of intangible assets at stake. Expertise and knowledge of mature employees have yet to be institutionalized in order to maintain a significant part of the company's intrinsic value. (Schramm, 2006) The authors will mainly concentrate on the potential of white-collar workers, since classical office work is physically less demanding and the general health condition of the maturing work force has remarkably increased. Furthermore, this paper will reflect additional options by analyzing the gender gap, migration flows and the necessary paradigm change in the society.

This development will require policymakers, institutions and individuals to rethink their attitude towards older employees. A holistic solution must be found to adequately address these issues and more importantly, make use of the profound changes in society. Policymakers will want to revise the parameters of the retirement system; institutions are expected to adjust their recruiting and internal policies to counter the imminent risk of a skill shortage (micro perspective) and individuals will be turning the scales in this whole matter.

The paper is structured into five parts. After this preliminary introduction, the demographic trends in Western Europe and the United States are described in the second chapter. After presenting the macro dimension of the demographic change, the third section resumes on the micro level and ponders arguments regarding retirement policies from an employee and

employer's point of view. Presenting a solution framework on firm and government level is the central part of the 4th section. To conclude the paper, the authors provide a brief summary and conclusion.

Demographic Development

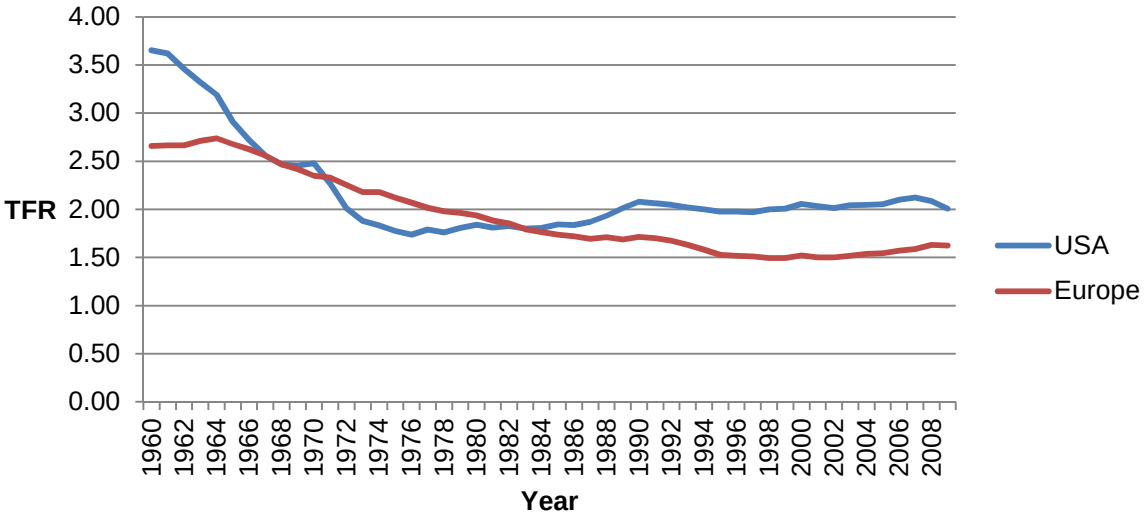
With the upcoming retirement of the baby boom generation, which is predicted to start at the end of this decade, several social problems will arise that have to be addressed. This chapter focuses on the ongoing demographic developments in the workforce of the mature economies in Europe and the USA.

In their SHRM Workplace Forecast Report, the Society for Human Resource Management has pointed out that the ageing of the population was the most important demographic trend in 2004 and 2006. (Schramm, 2006) They predict that most industrialized countries can expect a large growth of the number of old citizens' aged 65 or older. (Schramm, 2006) In Europe and the US the most important demographic changes in the economy are the shrinking and the changing composition of the workforce (European Foundation for the Improvement of Living and Working Conditions, 2010). These changes are mainly caused by three factors: First, the decreasing fertility rates in mature economies, which have led to a slowdown in population growth. Second, lower mortality rates and longer life expectancy, thanks to improved medical assistance and thirdly migration and the increasing importance of immigrants within the labor force. (European Foundation for the Improvement of Living and Working Conditions, 2010) These trends will impose major challenges on the European and US economies.

Decreasing Fertility Rates

To measure and compare fertility rates across countries, there is a standardized indicator called total fertility rate (TFR). Another indicator is the level of fertility at which a population exactly replaces itself from one generation to the next, namely the replacement level fertility (RLF). In Europe, statistical data from individual countries has revealed that in 2006 only a handful of countries within the European Union have reported fertility rates that where close to the replacement level. The total average fertility rate in the European Union has shown a decreasing trend ever since the 1960's and was at a level of 1.53 in 2006. With such a low fertility rate, long-term growth of the population will not be sustainable. (European Foundation for the Improvement of Living and Working Conditions, 2010)

Figure 10: Total Fertility Rates: Europe and USA



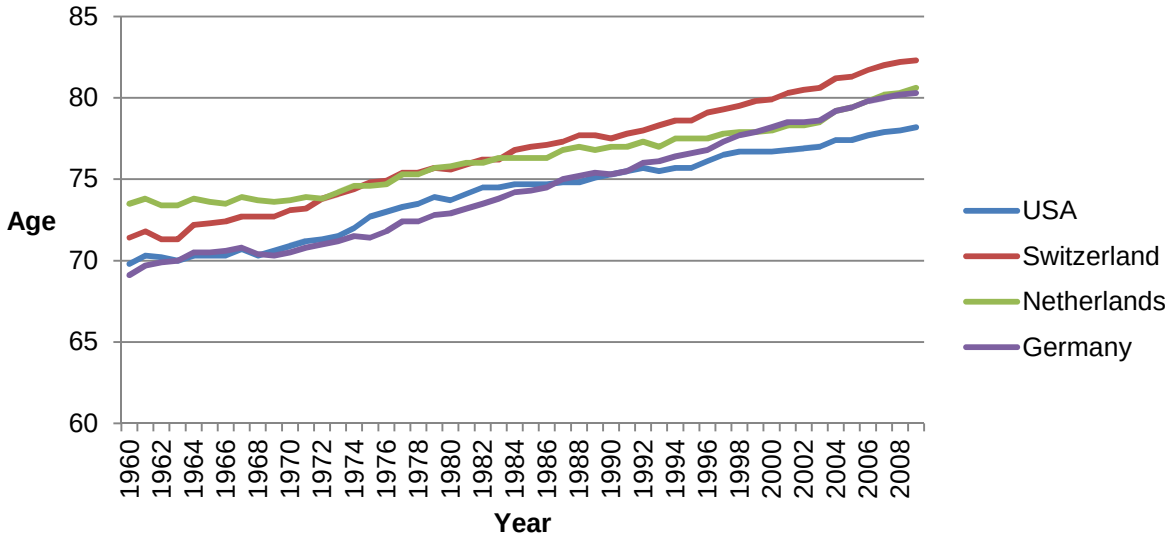
Source: www.oecd.org

In the US there has also been a decline in fertility rates ever since the birth of the baby boom generation. The Census Bureau has estimated that the US population growth will decline from a steady average of about 1 percent in the 1990s to 0.7 percent in 2007. (Little & Triest, 2001) The decline is even more pronounced in the growth rate of the workforce, which will be at 0.6 percent and therefore decrease the share of the workforce in the entire population from currently 52 percent to 45 percent until the end of the 21st century. (Little & Triest, 2001)

Lower mortality rates and population ageing

The second major trend in Europe has been a distinct reduction in mortality rates and longer life expectancy, thanks to better medical assistance. In Switzerland, life expectancy has increased by almost 11 years since the 1960's, from 71.4 to 82.3. Even though not all member states of the European Union have reported statistical data about life expectancy, there is a consensus among experts that life expectancy has continuously increased in Europe since the 1950's. The data shows that there are considerable differences in life expectancy within the individual countries. Overall there is also a large difference between genders. In 2004 data showed that in Europe women lived on average 6.3 years longer than men (81.5 vs. 75.2). (European Foundation for the Improvement of Living and Working Conditions, 2010) The ageing of the population has also been observed in the US and the Census Bureau has estimated that it expects the share of the population over the age of 65 to increase from at the moment 13 percent to 20 percent by 2050 and to 23 percent by 2100. (Little & Triest, 2001)

Figure 11: Average Life Expectancy at Birth



Source: www.oecd.org

Migration

In the last two decades migration has been the most important factor that has influenced the size of the European population. In 2007 the natural population growth, consisting of 483'538 people, only accounted for one fourth of the total population growth, consisting of 2'101'579 people, in Europe. The EU is today a major destination for global migration flows and it has been estimated by the European Commission in 2009 that without the migration inflow, the population would start shrinking by 2012. (European Foundation for the Improvement of Living and Working Conditions, 2010)

To secure the continuous growth of the economy and the workforce, the US market also relies heavily on immigrants. The immigration and Neutralization Service (INS) has reported that over the past ten years immigrants have supplied for roughly 35 percent of the growth in the US population. In the year 2000 more than half of these immigrants came from Latin America. The Census Bureau anticipates immigration to further increase in the near future. (Little & Triest, 2001)

Outlook

How will these demographic trends affect the US and European economies and what further developments can be expected in the upcoming decades?

The European Foundation for the Improvement of Living and Working Conditions predicts that at the moment an increase in the labor market supply is expected, since both the labor market participation and the working age population are increasing. This growth in the European workforce will continue in the period from 2012-2017, since a rise in employment rates

will overcompensate for the decline in the size of the workforce population. From 2018 on however, the growing labor market participation rates will not be able to offset the ageing effect anymore and the level of total employment in Europe will start to decline. There will be a considerable shortage of labor supply on the full spectrum of the workforce and not only for highly qualified workers. (European Foundation for the Improvement of Living and Working Conditions, 2010)

Similar trends are expected in the US. In the twenty first century the US population is expected to grow more slowly and age more rapidly. The US will once again have to rely on immigration and become a nation of immigrants. As in Europe the challenge will be how a relatively small workforce will supply the consumption needs of a growing number of dependents. The problem of an increased dependency ratio will however not be as drastic as in Europe since the US possess over a younger average workforce. According to the Administration of Aging, by 2030 the number of citizens over the age of 50 will grow to more than 35 percent of the population. As a shortage of workers is anticipated in some industries and occupations, immigration to the US is expected to increase. The Census Bureau projects that the new immigrants and their offspring will account for almost 65 percent of the growth in the US population and for over 75 percent of the growth in the working age population in the 21st century. Most of the new immigrants are young adults with low education levels that tend to have above average fertility rates and number of dependents. This is the reason why many analysts have come to the conclusion that increased immigration will only partially reduce the high dependency ratio problem. (Little & Triest, 2001)

Globalization and the upcoming labor shortage in the home market will allow companies to acquire talent from all over the world. As mature economies will more and more compete for highly skilled global knowledge workers, cross border employment and offshoring activities to developing countries will increase. (Schramm, 2006) The decline in the working population will also force people into the workforce that were not in it before. (European Foundation for the Improvement of Living and Working Conditions, 2010) Especially participation rates of both female and elderly employees are expected to increase, however the increase in the female workforce will only have a neglectable effect on solving the labor shortage problem. (Little & Triest, 2001)

Social pension problem

One of the major problems that comes with the ageing of the population, are the rising retiree benefit and health care costs. (Schramm, 2006) The increased costs will put substantial pressure on the funding of public pension funds and the society as a whole. Already in 2006, health care costs in the US were the number one cost pressure across the economic spec-

trum. (Schramm, 2006) The increasing age dependency ratio in most mature economies will further amplify this trend. In Europe the dependency ratio will grow from the current 28 percent, to 42 percent in the next two decades. This means that by 2030, on average 2.5 labor market participants will finance one retiree through their transfer payments. Currently this rate is at four to one. These numbers emphasize the severity of the demographic challenge that lies ahead. Society will have to rethink and restructure the social welfare and retiree benefit systems since the current policies will not be sustainable in the future. (Groth & Trippel, 2011)

Motives for Employees and Employers

The major demographic changes that will affect the European and U.S. economies in the next two decades are the ageing and the reduction of the workforce, the impending mass retirement of the baby boom generation and the growing age dependency ratio. (Schramm, 2006) These trends will lead to several social problems that will affect the society as a whole. To address these issues this paper focuses on the work potential of elderly employees in the service sector, between the age of 55 and 75. Thanks to increased life expectancy and good health conditions at retirement age, they resemble untapped potential of productivity. The mass retirement of the baby boom generation will cause scarcity in the labor market and particularly a shortage of highly skilled employees. Immigration is a valuable short-term solution to the problem but will not by itself have a large enough impact to offset the employee and skill shortage. What is needed to keep the labor force base at the necessary level, to allow economic growth, is a rise in the employee productivity levels and longer employee life cycles. Many companies have not yet realized what these impending workforce changes may mean and how they should be approached. (AARP, 2004) Solutions will have to be found on the micro level, therefore within the individual companies.

Today most firms have implemented recruitment and employee policies that do in fact worsen the demographic problem. There seems to be a misconception that companies need young, talented workers while offering elderly employee's retirement packages to lay them off early. (Dychtwald et al., 2004) According to Schrank and Waring (1989) firms believe that the costs for older employees are too high, so they try to get rid of them.

The majority of companies does not invest in the human capital of older employees and underestimate the time and costs it takes to replace the know-how and skills of older workers. Research has shown that in the US, two thirds of employers do not actively take concrete steps to retain or recruit older workers. (Dychtwald et al., 2004)

The first part of this chapter will analyze why individual employees decide to retire or remain in the workforce. In the second part evidence will be presented why employers should hire and retain or retire older workers.

Employee perspective

The retirement decision of individual employees depends on a variety of factors. Age is certainly one of them, however Weber and Skirbekk (2011) elucidate that the ageing process is experienced in different physical and mental health conditions across countries, gender and industries. For them, a more adequate way of measuring ageing is to draw attention to the workers capacities and work potential. Other factors that highly influence the retirement decision are the level of public pension benefits, a country's old age support system, the productivity of older workers and the level of labor force participation (Lee, 2011).

As previously mentioned the focus of this paper is not on the physically demanding labor industry but on the office space, where most employees, when they reach the retirement age, are still in a good enough health state to continue their professional activity. Compared to industry workers, office space workers have an above average life expectation. To address the problems that will come with the demographic changes, healthy and still competent workers will be one of the major labor supply sources that have to be taped. The following paragraph will analyze the reasons why healthy employees retire or stay in the workforce.

Why do people stay in the workforce?

A countries level of public pension benefits and old age support systems will highly influence the retirement decision. The increasing number of retirees will put pressure on pension funds and most probably force them to lower average pension benefits to individuals. Additionally the increased life expectancy will force workers to accumulate wealth in anticipation of future needs for consumption, since they know that they will have longer retirement periods. According to the SHRM Workplace forecast, for 48 percent of those who continued working after they passed the retirement age, the top reason was money. (Schramm, 2006) People with a lack of retirement saving are forced to continue working and will remain in the labor force. The issue with this is that most of the workers with inadequate savings are those in the low to medium skills range. This enhances the demographic problem since many highly qualified workers leave the workforce, which leads to a skills shortage in the office space. (Schramm, 2006)

With the employee's greater demand for wealth to finance their life longer period of post work consumption, the trend will be to accumulate more savings and lower consumption. Lower consumption could curtail a countries economic performance in the long run. The effect of the demographic change on savings will however differ substantially from country to country depending on population age structures, labor force participation and productivity among elderly workers. (Lee, 2011)

For women this trend will be even more severe. Women on average outlive men and in general are less likely to have adequate retirement savings, due to lower average earnings and more time periods out of the labor market, mostly due to child rearing. Low savings will force women to stay in the labor market and will lead to an increase in the share of older women workers. (Schramm, 2006)

A different reason why elderly people stay in the workforce is job satisfaction. Many people love what they do and their job has become an integral part of their life. Some elderly have the notion that by retiring they will conclude their beneficial life. Retirement to them would be to accept that their productive life is over and gives them a feeling of backing out of life. Many are just not ready to step into the third stage of life. Others feel personal fulfillment in executing their job. Especially employees in higher ranks of companies do not want to lose their status and position of power. They know that if they retire they will forfeit a certain social rank. On the other hand many workers feel a social responsibility to continue working and to contribute their share to society.

Another reason why people continue to work is that most elderly do not know what else to do in life. Surveys have shown that half of today's retirees say that they are bored and restless. Additionally one-third of those older than 55, who have accepted early retirement offers, have gone back to work. (Dychtwald et al., 2004)

For a smaller proportion of the population a different reasoning can be the motivation to stay in the workforce. Many firms honor the expertise and the social network of older employees and offer them high positions in the hierarchy of the company. This is why many older workers experience their most successful years in the late stages of their career and remain in the workforce well past the age of retirement.

Why do people retire early?

People mainly retire early because they can afford to do so. Lee (2011) proves in his paper that there is a positive correlation between rising levels of economic development and earlier retirement. Several studies in the late 1980s in the US have shown that even substantial

changes in the social security program would cause only small changes in the average retirement age. Lee (2011) comes to the conclusion: “In wealthier countries people live longer and remain healthier, but they are not willing to work more because they can afford to have more leisure at the end of their lives by relying on their own resources or on public resources” (p.14). This implies that policy changes that consider an increase in the retirement age to stop highly skilled workers from early retirement might be the wrong way to achieve this objective. Since the effects of such a policy change are believed to only partly slow down the diminishing participation trend of older workers in the labor force. (Lee, 2011)

Some workers retire early because they are not physically capable anymore to adequately fulfill their job duties. Some people have bad health conditions or chronic illnesses and can’t remain in the labor force. This proportion of people in the service sector will however shrink in the future, since medical treatment is improving and more illnesses can be cured.

Employer perspective

Elderly workers do have a variety of advantages and disadvantages. Many firms however mainly see the weaknesses of older employees and underestimate their potential and benefits for the company. The following paragraph will first present reasons why employers should retain and actively recruit older workers and in a second part show why the employment of elderly could lead to problems on the firm level.

Arguments supporting older employees:

1) **Productivity**

Studies and practice evaluations have confirmed that ageing does not lead to a decline but rather to a shift in performance. Although age leads to a decline in physical work capacity, the mental work capacity like awareness and concentration does not decline. Personality characteristics such as thinking, emotional and action dimensions, emotional stability, self-perception or self-efficacy beliefs remain largely stable well into old age. Additionally age on average enhances cognitive and social skills. Research has also shown that performance prerequisites such as memory, intelligence, social skills, creativity, problem-solving skills or the ability to cope with stress are highly dependent on the amount of stimulation individuals are exposed to in the course of their careers. These abilities can if actively supported be maintained or even improved during the working life. (Buck, Kistler, & Mendius, 2002)

Mature workers can have many valuables attributes. They generally have more experience and wisdom, which is of specific relevance. This can be very valuable for a company, especially in jobs that require a large amount of firm specific human capital. (AARP, 2004) In to-

day's knowledge economy more and more intangible assets are making up a greater proportion of the company value. The expertise and knowledge base of older workers are a large part of these intangible assets. (Schramm, 2006) By allowing elderly to retire, companies risk the loss of competence and experience since often firm-specific knowledge has not been institutionalized (Buck, Kistler, & Mendius, 2002).

Social and network skills are also a part of the intangible assets of a firm. Depending on the sector, networks and customer relations of mature workers are of great value to the company. Many workers have built up a large customer base and represent the face of the firm on the marketplace. New and young employees can hardly replace these social networks with business partners and customers.

2) Loss of leadership skills

The danger that comes with the baby boom generation retiring is that there will be a scarcity of key talent. In many companies, cutbacks have reduced leadership development and succession planning. This will lead to a shortage of well-qualified leaders within companies. Leadership development will become critical in the near future and HR professionals will have to increase retention initiatives to retain the most valuable employees. (Schramm, 2006) Experienced workers that have been in leadership positions can be used as consultants and mentors for younger leaders and enhance the intergenerational knowledge transfer (Buck, Kistler, & Mendius, 2002).

3) Intergenerational Workforce

With the ageing of the population more and more generations have to work together at the workplace. Although an intergenerational workforce can cause problems, companies can benefit from synergy effects. The different generations can learn from each other and can increase the quality of work by using a variety of different generational perspectives. (Schramm, 2006).

4) Overpayment of older employees

In difficult financial times firms are often forced to cut costs. Since many employers believe that the salaries of their mature workers are too high considering their productivity level, older workers will always be the first ones to suffer under the effects of structural changes. To cut costs, employers will try to lay off mature workers or send them into early retirement.

Studies in Austria have shown that in the service sector, an aging workforce does not imply a negative productivity effect nor is there clear evidence that elderly employees are overpaid. Mahlberg et al. (2011) also support this argument and show that in Germany a larger share of older workers does not affect the productivity of a company. They argue that the

productivity of the workforce increases until the age of 40-45 and shows no considerable decline until the age of 60.

In Austria research results have even indicated that labor productivity seems to be fostered by employing a high share of old worker (Mahlberg et al., 2011). These productivity measure findings might however be biased. Mahlberg et al. (2011) conclude that the results in Austria indicate that elderly employees do not tend to be overpaid for their productivity level. They remark however that the Austrian market is characterized by a rather low effective retirement age, which could suggest that those employees, who are still in the workforce, could be the productive ones.

Lee also addresses this issue and contends that employees with poor physical and mental health conditions who know they will retire soon, are less likely to invest in their human capital in the later stages of their career. He believes that this could be an explanation why empirical results about the performance of older workers have not shown a decrease with age; since only those who have a high productivity and take part in advanced training remain in the labor market. (Lee, 2011)

Arguments against older employees:

1) **Productivity**

Age does deteriorate performance in certain areas. It has been proven that reaction time, perceptual skills and information processing slows down in old age. In contrast to mature workers, younger employees are also more flexible and creative. (Buck, Kistler, & Mendius, 2002)

2) **Knowledge revolution**

Some critics argue that the world has changed too fast for the knowledge of the older generation. The world today is facing a knowledge revolution, where workers are required to have a completely different knowledge set than a few decades ago. It may be too costly and work intensive for older employees to adapt to these new skills. This is why critics' state that the effect of the knowledge revolution has to be considered and firms will do better by acquiring younger employees. (Crettez & Le Maitre, 2002)

3) **Intergenerational workforce**

The intergenerational workforce of the future is anticipated to cause various problems. Different working styles and negotiations about acceptable working hours might lead to conflicts between worker generations. (Mahlberg et al., 2011) show that companies that have many employees within one age group do cooperate more efficiently, thanks to a similar

work behavior, attitudes and way of communicating. Elderly employees will most probably have access to different health care and retirement benefits, which will no longer be available to younger generations. This could give younger workers a perception of discrimination. Another source of conflict could be that if many retirees stay in leadership positions far beyond the retirement age, the career progression expectations of the younger workers could be dampened. If the young generation believes that they will not be able to reach high positions in the hierarchy of a firm, this could be demotivating and reduce the productivity of the employees. (Schramm, 2006) All of these aspects suggest that for some companies it might be of benefit to retire older workers and replace them by a workforce of similar age.

4) Rising retiree benefit and health care costs

The demographic change will lead to rising retiree benefit and health care costs for the state and the firms. This could have severe economic repercussion for the employers. The increase in health care cost due to the older workforce has forced many employers to rethink their current policies and shift costs on to their employees. Firms have reduced employee's wages and decreased the hiring of new staff. More and more companies are placing limits on their future financial obligations for retiree health coverage. (Schramm, 2006)

Opportunities

The following part introduces strategies and visions to counter the demographic challenges of the upcoming decades. The aggravating shortage of skilled workforce will make it essentially important to maintain intellectual capital and relationships within the company (AARP, 2004). Highly qualified and motivated employees are among the most valuable resources to a company (Buck et al., 2002). In the course of the impending skill shortage within the upcoming decades, it is vital to understand the needs of the evolving group and adapt new strategies accordingly (AARP, 2004).

The focus will first lie explicitly on the employee age group of 55 years and older, before expanding the horizon to further implications and points of view in the second part of this section.

4.1 Firm-level

4.1.1 Recruiting strategies

A lot of organizations still have the contracting assumption that young talents will "give the firm a lifetime of service"(Schrank & Waring, 1989, p. 122), such that HR departments would

be wasting money investing into the sophisticated recruitment of mature workforce. The ambivalence that age, and with that experience, correlates with better jobs and higher costs often leads to “open-window plans”(Schrank & Waring, 1989, p. 115-116), for mature employees. They get encouraged to take enriched retirement packages to voluntarily retire early and make way for younger and commonly lower-paid employees. In fact however, older workers are more loyal and will most likely serve more years than a young employee desperately trying to climb the ladder. (Schrank & Waring, 1989)

In order to address this unconventional broadened potential target group, it is crucial to adopt existing recruiting strategies, which starts by the choosing the appropriate words in a job advertisement. Attributes like *fresh thinking*, *dynamic*, and *energetic* and so forth are not only considered to appeal to young applicants, but moreover alienate mature ones. They are more likely to respond to advertisements focusing on expertise, knowledge and experience. As a result, recruiting specialists also see the need to alter interviewing techniques. The use of confusing case studies as Microsoft practiced them were intimidating to older applicants; a major British bank hence replaced these with role-playing scenarios to examine the candidates’ abilities. (Dychtwald et al., 2004)

Attracting retirees and retaining valuable retirement eligible employees conditions tailored jobs, an adjustment in working culture and flexibility in the working conditions. It is crucial for recruitment to acknowledge this trend and implement appropriate measures to attract older workforce. Deere & Company in Moline (Illinois, USA), for instance, acknowledged that the majority of their workforce is eligible for retirement within the next ten years. Thus, they motivate their mature employees to remain with the company to add value and to pass on their knowledge to new employees (AARP, 2004). Another prominent example was Harry Stonecipher, born 1936 and former vice president of General Electric. He was elected as Boeing’s CEO when he was 67 years old and successfully merged the firm with McDonnell Douglas Corporation, the third largest commercial airplane manufacturer. (Dychtwald et al., 2004 and www.referenceforbusiness.com, 03.11.2011)

4.1.2 Work environment

Typically the most capable and most accomplished amongst the older work generation are the most financially independent and hence the ones who are most likely to move on or go into early retirement. It is therefore essential to align the working environment, such that the prerequisites of mature employees can be met. (Dychtwald et al., 2004)

Making sure that older workers are treated with respect and appreciation within the company is a common criterion when asked for an appropriate work culture. (Armstrong-Stassen, 2007). A culture that honors experience and recognizes achievements and is not age ambivalent is of vital importance (Dychtwald et al., 2004). Deloitte has created a so-called Senior Leaders program, which allows their partners in their early fifties to redesign their career paths. The program selects candidates that "(…) made a unique contribution to the firm and would continue to add significant value" (Dychtwald et al., p. 53). Becoming a senior leader is therefore very prestigious and motivates mature employees to continuously strive for success. (Dychtwald et al., 2004)

Furthermore the performance evaluation process needs to be comprehensive, unbiased and provide useful feedback. The compensation must be fair in respect to the assignment and performance. (AARP, 2004)

Equality is not necessarily a precondition. It is common for 65+ age workers to seek for a more flexible appointment, e.g. part time job, flexible work schedules, consulting activities and/or home office opportunities (Armstrong-Stassen, 2007). Schramm (2006) further elaborates that "(…) more flexible work arrangements to all employees can be used as a way to attract younger and retain older workers" (p. 39).

Flexible retirement and phased retirement is an idea intensively discussed by Schrank and Waring (1989). Phased retirement enables the employee to gradually adapt to a life with more discretionary time without loosing the fulfillment of working. Phased retirement is also in the interest of the organization, since it encourages workers with valuable and scarce skills to prolong the stay within the company. (Schrank & Waring, 1989) The pharmacy chain CVS, for example, has no mandatory retirement age anymore. As a result they have six employees that are in their nineties. Varian, a leading provider of radiotherapy systems, favors the approach of flexible retirement by negotiating a reduced work schedule with its mature workforce. (Dychtwald et al., 2004)

Accumulated stress and the consequential underperformance of mature employees is often seen as natural cause of age itself, however age actually only comes into play when the job requirements can no longer be covered by the employees work capacity (Buck, Kistler, & Mendius, 2002). Stress is induced when the person feels like he cannot complete an assigned task in the corresponding time period. With today's technology, namely smart phones and very user-friendly tablets; time management and workload organization can be remarkably simplified. Although, these revolutionary devices are controversially known to often be the cause of stress, due to the theoretical 24 hours reachability, sound usage and self-preservation can be of helpful assistance.

Job Design

The work environment should be designed in a way that enables the employees to remain active without physical and psychological work overload. Buck et al. (2002) suggest the term of “ageing-appropriate job design”. This does not only include a lenient mental stress level, but also physical activation aspects such as ergonomic seating or to organize meetings around stand-up tables.

4.1.3 Organization and Career Development

Buck et al. (2002) further note that flatter hierachies and an ageing workforce will make traditional vertical careers and upward career progression increasingly difficult. However, horizontal career steps can make optimum use of the work demand within the respective company. It lies within the nature of a hierachical organization to have fewer promotion possibilities near the top than in the middle, hence opportunities for promotion decrease with experience and age (Schrank & Waring, 1989). Buck et al. (2002) argue that horizontal career pathways are important and can furthermore alleviate the conflict between younger and older employees in the promotion tournament. Typically an older employee, who’s served his company well over several years will have a nonreversable advantage, possibily demotivating junior employees in the long run.

Job development is, according to Armstrong-Stassen (2007), a vital aspect for mid-career employees. She further argues that meaningful tasks are an essential aspect in that respect. AARP (2004), who’s goal is to expand employment opportunities for older workers, describes this trend as „career counseling“(p. 4). It embodies the idea to help employees realize different job opportunities within the firm.

4.1.4 Lifelong learning

The rapid development of the computer industry has considerably changed the standards of an office job. It has become crucial for the pre-computer generation to catch up with their younger competitors. Life long learning, which describes the notion of continuous education throughout work life, is not exclusively for the older generation. In fact, younger employees generally invest more time to keep their skills up to date in order to remain competitive. (Buck et al. 2002) Buck et al. (2002) further state that it has to become an “established part of companies’ personal development and working culture to achieve the full potential work performance” (p. 76). The responsibility lies with the employer to provide opportunities for continuous training and offer the employees opportunities to take on new tasks. It is essen-

tial to give incentives to learn and further develop skills. Especially the mid aged work force that completed their education a long time ago might not see the need to attend further education.

Little & Triest (2001) point out one possibility of reducing the imminent demographic problem, i.e. relatively small work force in comparison to the growing number of dependents, is to increase productivity. One way to increase productivity within the existing workforce is to stress advanced vocational training, preferably in-house, in order to maintain and extend work efficiency and potential in future. (Kunze, 2010)

4.2 Government-level

4.2.1 Feminization of the workforce

Historically employment rates of women have been lower than those of men. Due to increased participation in higher education, women posses equal qualification levels as their male antagonists. Nevertheless, a gender gap in the employment rate remains. The main reason for this gap is a gender division of labor in private households. Although this gender gap still exists, there is a definite decreasing trend. (European Foundation for the Improvement of Living and Working Conditions, 2010)

As a consequence women's share in part time work is far greater than men's, supporting the notion that there is still a significant gender related household separation. Interestingly, Scandinavian countries, which are known for their equality supporting and family friendly political system, have remarkably lower gender gaps. The goal, from a demographic research point of view, is to bring in a higher percentage of women into full-time employment. One business model supporting this solution is home office, which would theoretically allow combining childcare (5-6+ year infants) and near to full-time occupation.

Within the EU27, there is a trend showing that more women enroll in tertiary education than men do. (European Foundation for the Improvement of Living and Working Conditions, 2010) In respect to the knowledge society and taking into account the looming shortage of highly qualified workforce, it surprises that despite the fact that women represent the richest pool for skilled labor – many organizations haven't recognized that yet. (Buck, Kistler, & Mendius, 2002)

In conclusion, policymakers need to not only promote age neutral working conditions, but also gender unbiased employment in order to contain the issues caused by the future demographic development.

4.2.2 Immigration

Fotakis (2000) believes immigration is part of the solution when addressing the demographic challenges. Under the assumption that labor demand remains sufficiently strong, immigration can help to decrease the dependency ratio. (Fotakis, 2000) Only legal immigration is considered, since illegal immigrants cannot actively participate in the work force, pay taxes and therefore contribute to welfare. A very prominent example of this approach are the United States. According to the Immigration and Neutralization Service (INS), legal immigrants made up for approximately 40 percent of the growth in the USA labor force in the mid 1990s. (Little & Triest, 2001)

The G-20 workshop on “Demographic Challenges and Migration” presents further compelling arguments. They decomposed GDP growth per capita into three elements, namely population growth, participation in the labor force and productivity growth. They establish a link between these so called “three P’s” by showing that slower population growth in developed economies will negatively affect growth in GDP per capita. As a consequence, migration can be seen as a short-term solution to increase population growth. In the long run however, migration cannot solve the general issues caused by population ageing, but it can delay the process such that governments and institutions have time to adjust their policies to more appropriate settings. (Australian Goverment, 2005)

4.2.3 Society

Retirement as it is known today is actually a relatively new invention of modern culture. It was only during the Great Depression that unemployment rates dramatically increased, leaving a mass amount of young potential workers without a job. Unions, governments and organizations then institutionalized retirement programs alongside with social security and pensions plans, as it is common today. When the idea of a retirement age first came up towards the end of the 19th century, the average life expectancy was significantly lower compared to todays’. (Dychtwald et al., 2004)

Despite the widely embedded thought of having a fulfilled life of health and leisure once the age of 65 has been reached, a change of this social paradigm will have to be reconsidered.

Conclusion

The demographic changes that will occur in the next two decades will impact society significantly. Solutions will have to be found on the government, as well as on the firm level. The most important factor is that firms realize how important and beneficial older employees can be. Depending on the existing demographic makeup of individual companies, the upcoming demographic changes will impact organizations in different ways. Problems will arise sooner in industries where the workforce is already proportionally older, since there will most probably not be enough new workers to replace the retirees. It is the responsibility of the human resources professionals to analyze the demographics of their workforce and create strategies to attract and retain the most highly skilled workers in an increasingly global knowledge economy. It will be incremental to introduce structures that more appropriately address the needs of elderly employees and allow them to prolong their working life. The solution to the demographic challenge lies with the entire society and all generations will have to contribute their part to the puzzle.

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Demography meets Business

Micro Outlook until 2030

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Megatrend 'Global Demographic Change': Tackling Business and Society Challenges in 2030 and Beyond

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November 2011

Executive Summary

In the upcoming 20 years impressive demographic changes are at hand. Regional differences result in diverse challenges, where current stages of economic development serve as a starting point for forecasting their demographic future and its links for businesses in 2030.

Managerial / political challenges will materialize with respect to

-**Aging** societies for Europe (particularly Germany and Italy), Japan, China, Singapore, soon also Russia and Canada. Notably, maintaining a skilled workforce and preparing health systems and retirement provisions for the changing dependency ratios. From a business perspective for all developed countries innovation and education become crucial to maintain a competitive advantage meanwhile their population size declines.

-**A redistribution of Wealth Worldwide**: Asia with 4.8 billion people will not only hold the largest share of population in 2030 but also be a major economic power. China's GDP is projected to account for nearly 16%, and India's for 5% of the World's GDP in 2030. On the other hand, Japan is forecasted to be the big loser as Japan's GDP will decrease.

-A **population increase of 50% for Africa**, as the region with the most significant demographic and economic challenges in the twenty years to come. The big question will be if Africa can follow the footsteps of the Asian Tiger States, unlocking a demographic dividend. This highly depends on a decrease in fertility, stable political environment, further job creation and a healthier workforce. These factors are dependent on education and business financing, both permitting for entrepreneurship.

Table of Contents

1. Introduction

Demographic change has become a topic of wide concern: Tremendous changes are forecasted for the years to come. All corners of the World will face different challenges as their development stages vary widely.

Sub-Saharan Africa will have to cope with a huge population growth. Europe, Japan and other developed nations concern is an aging population, restraining a balanced workforce and securing their health and pension systems.

On the other hand, developing nations in Asia and Latin America are concerned with decreasing fertility rates and rising median ages. They will have to redefine their competitive advantage in the coming years as cheap labour will be harder to come by.

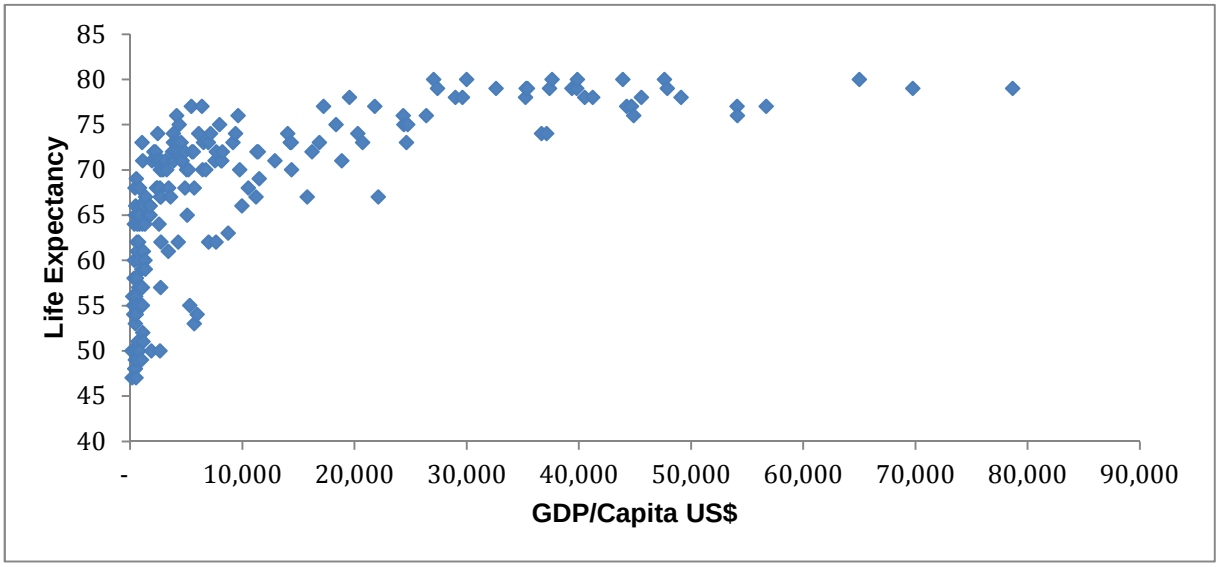
The focus of this paper will be to create a link between demographic changes and business, with a focus on entrepreneurship in Africa. First of all, a general connection between demographic variables and economic drivers will be explored based on economic models such as Solow's growth model and various econometric studies.

The causal relations linking demographics to business is used to simulate a global scenario by region for 2030. By concluding the demographic scenario some general economic and business links are provided. Finally, at the example of entrepreneurship in combination with micro finance, specific insight into the interplay between demographical dynamics and Africa's entrepreneurial future, in particular that of Sub-Saharan Africa, is being elaborated on.

2. Quantitative Analysis Using Historical Data

The impact of demographic determinants on economic development has always been a research area of interest. In early studies on this matter, it is already largely argued that various life expectancy factors are the most important drivers for economic growth (Preston, 1976). Factors such as sanitation, medical technology and public health infrastructure have gradually increased the human life expectancy. However, the causal effect is difficult to identify, as those same factors are subsequently highly dependent on the economic development of a given country or region (Bhargava, Jamison, Lau, & Murray, 2001). Therefore this part of the paper will give an insight into these complex interactions between demographics and economics through various economic and econometric models.

Figure 1. Correlation between life expectancy and GDP/capita



Source: United Nations Statistics Division (2010)

2.1 Basics and General Results

Current macroeconomic models agree that health has a positive impact on productivity because a healthy population will likely work harder and longer than a sick one especially in developing countries, where a high proportion of the population is employed for manual labour (Bloom, Canning, & Sevilla, 2004). The famous Solow model, which can be written as:

$$Y = AK^{\alpha}L^{1-\alpha}$$

states that human capital has a positive impact on economic growth and health is an element of human capital (Solow, 1956). According to the Solow model an economy

needs, besides human capital, also technology (know-how) and financial capital to grow. Thereby, each of the three factors can to a certain extent contribute towards economic growth.

Meaning that demographic changes resulting in a larger population and workforce can lead to a higher absolute GDP. The methods analysed will focus on panel data to try and isolate the desired effect by examining countries experiencing a strong demographic and economic shift over a given period

2.2 Checking for Endogenity

An endogenity issue arises between health and work experience when trying to identify a causal relation of life expectancy on productivity. It is fairly obvious that on average if life expectancy is higher, work experience will also be higher and it is important to find out whether an increase in productivity can be attributed to life expectancy or work experience. Bloom et al. (2004) consider a model with an aggregate production function that expresses a country's output as a function of its inputs, which are physical capital, labour and human capital and further decompose human capital into education, work experience and health. The model also considers the efficiency with which these inputs are used with a total factor productivity (TFP), allowing for cross-country differences in steady state and for technological diffusion. The first model we examine assumes that the TFP level is similar in every country.

Table 1. Production function in growth form, common long-run TFP across countries Dependent variable: growth rate of GDP; nonlinear two-stage least squares estimates

Right-hand side variables	(1)		(2)		(3)	
Capital	0.522*	(0.067)	0.424*	(0.094)	0.342*	(0.116)
Labour	0.493*	(0.080)	0.633*	(0.121)	0.708*	(0.136)
Schooling	0.085*	(0.039)	0.081	(0.048)	0.082	(0.049)
Experience			0.208	(0.176)	0.266	(0.203)
Experience^2			-0.0045	(0.003)	-0.005	(0.003)
Life expectancy					0.013	(0.011)
Technological catch up	0.196*	(0.040)	0.191*	(0.041)	0.214*	(0.043)

Source: Bloom et al. (2004)

* Statistically significant at the 5% level

The results in column (1) of Table 1 only include capital, labour and schooling as inputs; the results are statistically significant and consistent with constant returns to scale. In column (2) we add our experience variables, which have the effect of ren-

dering all of our variables on human capital non-significant. In column (3) we add our life expectancy variable, which indicates that an increase in life expectancy by one year improves work force productivity and raises output by about 1.3% but the results remain statistically insignificant. The results found above might originate from the assumption that the steady-state level of the TFP is the same in every country. This assumption is relaxed in the following model.

Table 2. Production function in growth form, country specific long-run TFP
Dependent variable: growth rate of GDP; nonlinear two-stage least squares estimates

Right-hand side variables	1		2		3	
Capital	0.457*	(0.065)	0.479*	(0.068)	0.190	(0.151)
Labour	0.583*	(0.085)	0.589*	(0.088)	0.824*	(0.145)
Schooling	0.015	(0.038)	-0.026	(0.045)	-0.025	(0.043)
Experience			-0.074*	(0.034)	-0.059	(0.036)
Life expectancy					0.040*	(0.019)
Technological catch-up	0.186*	(0.039)	0.194*	(0.042)	0.278*	(0.045)
Land area in tropics	0.432*	(0.207)	-0.329	(0.204)	-0.332*	(0.161)
Governance	0.098*	(0.045)	0.104*	(0.047)	0.149*	(0.050)

Source: Bloom et al. (2004)
* Statistically significant at the 5% level

The results in all three columns of Table 2 indicate that schooling does not have a significant effect on work force productivity. However, column (3) shows that increasing life expectancy by one year leads to an increase of 4% in GDP. Weil (2007) finds similar conclusions when analysing the effect of adult survival rate as a measure of health on GDP per worker. Therefore these results indicate that life expectancy does indeed have a real effect on productivity.

2.3 Results of Various Studies

Table 3. Macroeconomic growth studies with a focus on health

Study	Growth measure	Health measure	Coefficient
Knowles and Owen (1997)	Log difference of GDP per employed person 1960-1985	Log of 80 years minus life expectancy at birth	0.381*
Rivera and Currais (1999)	Log difference of GDP per employed person 1960-1990	Log of the share of health expenditure in GDP	0.582*

Bhargava et al. (2001)	Growth rate of per capita GDP	Log of the adult survival rate	0.181*
Heshmati (2001)	Log difference of GDP per employed 1970-1990	Log of per-capita health expenditure	0.175*
Webber (2002)	Growth rate of GDP per employed person	Calorie intake per-capita	0.08
McDonald and Roberts (2002)	Log of GDP per employed person	Log of 80 years minus life expectancy at birth	0.12*
Rivera and Currais (2003)	Log difference of GDP per employed person 1960-2000	Log of the share of health expenditure in GDP	0.26
Bloom et al. (2004)	Growth rate of per-capita GDP	Log of life expectancy	0.04*
Jamison et al. (2005	Log of per-capita GDP	Log of the adult survival rate	0.50*
Weil (2007)	Proportional reduction in variance of log GDP per-capita	Adult survival rate	0.099

Source: Hartwig (2010)

* Statistically significant at the 5% level

As shown in Table 3, seven out of nine studies conclude that health has a statistically significant positive impact on economic growth, even when using different measures for health and growth. This suggests that it might be wise for governments to invest in health to increase their productivity. However all analyses were based on a large number of countries and while the positive relation stands strongest among poor countries (Weil, 2007), in developed countries the impact of a country's demographic situation on economic growth is hard to quantify and does not yield a clear relation (Stronks, Van de Mheen, Van den Bos, & Mackenback, 1997). While Heshmati (2001) and Rivera and Currais (2003) find a positive effect of health on economic growth for OECD countries, Knowles and Owen (1997) and McDonald and Roberts (2002) do not find statistically significant results that life expectancy has a positive impact on productivity growth in rich countries. Acemoglu and Johnson (2007) and Bhargava et al. (2001) even estimate a negative effect of the adult survival rate on economic growth for the United States, France and Switzerland.

As the analysis of the different models above has shown, there is no unique answer regarding the causality relation between health and economic growth. Policy makers are confronted with a tough dilemma when deciding whether to invest in economic growth to favour health development or whether to invest directly in health measures to improve productivity. The general consensus seems to indicate that for rich coun-

tries, income growth drives health and that investing directly in health does not yield any growth in productivity. Hartwig (2010) suggests that people care about health more from a welfare point of view and disregard the economic implications.

For poor countries however the general consensus shows that it is important for governments to invest in health. The returns of health on productivity are hard to quantify, but they are significantly positive and are an important factor in the long term demographic and economic development of a country.

3. Scenario of the Global Society by 2030

The link between demographic and economic variables has been established based on historical data in the first part of the paper. The focus is now set to the future. The various regions of the world are at different stages of their development and therefore start from different initial positions. The World Economic Forum regularly classifies the competitiveness of countries, as well as their stage of development using factors such as basic requirements (e.g. infrastructure, macroeconomic environment, health and primary education), efficiency enhancers (e.g. higher education, goods/labour market efficiency, market size) and innovation and sophistication factors (business sophistication and innovation). As demonstrated in the previous chapter some of these factors will be influenced by future demographic developments. A larger population comes with many new challenges in health systems and education on one hand, but on the other an array of opportunities arises with a larger market size. More people might be tempted to become entrepreneurs as demonstrated in Chapter 4.

The global population recently reached a size of seven billion people (in 2011) and is still experiencing sustained growth. In the medium fertility variant[76] the world population is projected to count 8.3 billion people in 2030 excluding extraordinary events such as wars or major diseases. This means a population increase of 21% compared to 2010. The majority of the population increase will take place in less developed countries because of three factors. First of all, they have a higher fertility rate than developed countries. Secondly, their median population age is young, resulting in a high number of women of childbearing age. Thirdly, due to improving healthcare conditions, people will see their life expectancy rise, as well as child mortality rate decrease (Sippel et al., 2011). At the same time, from a global perspective, an increasing number of countries have fertility rates below replacement level and people live longer. This leads to an aging world population; between 2010 and 2030 the median age is projected to increase by 17% to 34 years (UN Population Prospects, 2010).

[76] The medium variant fertility is at replacement level in northern America, Australia and New Zealand in 2010-2015, in 2020-2025 in eastern Asia and in all other regions except northern Europe after 2100. (Population Prospects, 2010)

3.1 Scenario by Region by 2030

Breaking down the global scenario by region, significant differences become visible. With 4.8 billion inhabitants, Asia will remain the most populated region in the world (Population Prospects, 2010). However, Africa will grow to 1.56 billion people in 2030 with a growth rate nearly four times to the one of Asia. Furthermore Asia, North America, Latin America, the Caribbean and Oceania will see their population size increase by 20%, which is much lower than Africa's projected 53% growth rate.

Europe's population will remain steady at roughly 740 million inhabitants (UN Population Prospects, 2010), (Hossman et al., 2008).

Table 4. World demographic data by region in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
World	8'321	21%	2.29	-7%	34	17%	4.7%	-1.3%
Africa	1'562	53%	3.59	-18%	22	15%	8%	-2.3%
Asia	4'867	17%	1.99	-9%	36	22%	3.7%	-1.1%
Europe	741	0.4%	1.76	11%	45	12%	0.7%	-0.2%
Lat. Am. & Carr.	701	19%	1.89	-13%	35	25%	1.7%	-0.7%
North America	401	17%	2.06	1%	40	6%	0.7%	-0.1%
Oceania	47	29%	2.36	-4%	36	9%	1.8%	-0.7%

Source: UN Population Prospects (2010)

By analysing the data in Table 4, certain patterns can be observed. Developed nations, mainly Europe, North America and Oceania generally have a low median age with a growth rate around 10%, whereas developing regions, such as Asia, Latin America and the Caribbean have a growth rate of 23%.

Africa despite a growth rate of 15% still has a low projected median age for 2030. These numbers can be explained by poor health care conditions in many African countries, leading to low life expectancy and medium age. In contrast, Asia, Latin America and the Caribbean are already one step ahead with their health systems and people tend to live longer. The pattern starts with a strong decreasing child mortality rate due to better health conditions or infrastructures. This results in a high population growth rate and an average reduction in fertility rate, as people realise that they need less children in order to remain at reproduction level (e.g. Africa). Finally the medium age increases, as there are fewer children and people live longer due to better health care conditions (e.g. Asia, Latin America and the Caribbean).

From an economic perspective, most North American, Oceanian and European businesses will continue to focus on technological innovation by mainly investing in R&D, education and infrastructure. Some major economies currently focusing on becoming more efficient are China, Malaysia, Thailand, South Africa, Namibia, Brazil, Chile, Russia and Turkey. Investments in efficiency enhancing production processes and better quality will become increasingly important in future. In order to achieve that, companies need well educated people as well as functioning labour and financial markets. Countries whose economies are at the earliest stage of their economic development primarily depend on factor endowments, mainly natural resources and unskilled labour. Currently, many Sub-Saharan African countries, Vietnam, Algeria, Egypt, Saudi Arabia and Venezuela can be classified in this stage. Industries in those countries mainly sell basic products or commodities. In the future, investment in infrastructures, a stable economic and political environment, a healthy workforce and basic education will allow these nations to move into more refined industrial areas (WEF, 2011).

3.2 Europe's Demographic Future

Low fertility, an aging population and an increasing number of immigrants will shape Europe in the future (Hossman et al., 2008). However, by having a more detailed look at various European countries, they face different demographic challenges (Hossman et al., 2008).

Table 5. Europe demographic data in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
Europe	741	0.4%	1.76	11%	45	12%	0.7%	-0.2%
Eastern	279	-5.2%	1.7	14%	44	15%	1.1%	-0.2%
Northern	109	10.1%	1.95	5%	42	5%	0.5%	0.0%
Southern	158	2.2%	1.65	11%	48	17%	0.5%	-0.1%
Western	194	2.6%	1.84	9%	46	8%	0.4%	0.0%

Source: UN Population Prospects (2010)

Currently (2010) the average fertility in Europe lies at 1.5 children per women, while a fertility rate of 2.1 would guarantee a constant population. As shown in Table 5 Northern Europe holds the highest fertility rate which combined with immigration

leads to a population growth of 10%. The political policies to support families in many northern countries explain this situation (Vähi and Tiit, 2009), (OECD, 2007).

Population growth or even stability in many European countries is only possible through immigration, particularly from Eastern to Western Europe. This explains why Eastern Europe's population is declining by 5.2%. Nevertheless, when looking at each European country individually, 30% will face a shrinking population between 2010 and 2030 (Hossman et al., 2008) (Haub, 2002). Generally, Eastern European countries will shrink – the most in Romania, Bulgaria and parts of Poland as well as some non-EU countries further east. Many countries in central Europe are stagnating. A few European countries will be able to grow: Luxemburg, Cyprus, France, Norway, Ireland and Island. Generally from all European countries, Italy and Germany will need the highest numbers of net migration in order to keep their population at a constant level (Hossman et al., 2008) (Haub, 2002). Russia has low fertility and high children mortality rates, as well as a fast-aging population and the lowest life expectancy in Europe. Moreover, a lot of people emigrate or move into urban areas. (Lindner, 2007), (Dash, 2001).

As fertility is particularly low in many European countries, they will be confronted with aging and a shrinking workforce. In 1980 Germany had a ratio of 172 youngsters (15 to 24 year olds) for 100 senior citizens (55 to 54 year olds). By 2030, that ratio will have fallen to just 65 for every 100 older men and women of working age (Eberstadt and Groth, 2008). Similarly, in 2030 the prospective ratio of younger to older manpower will be 63:100 in Greece, 64:100 in Austria, 61:100 in Spain, and a mere 52:100 in Italy. For Switzerland, the corresponding ratio in 2030 will be 71:100 (Eberstadt and Groth, 2008). In absolute figures it is predicted that the pool of manpower in Europe will decrease by seven percent between 2005 and 2030 (Eberstadt and Groth, 2008). These projections include net immigration of about one million people a year (UN Population Prospects, 2010). Without immigration the situation would be even more delicate. These changes in the workforce structure will have significant impact on Europe's economy. Human capital will become a critical resource for Europe. The countries, which are able to attract and keep a balanced base of well educated people will have a competitive advantage. It will be particularly difficult for Eastern Europe to avoid a "brain drain" towards richer countries in the West. In Western Europe the focus is more on establishing appropriate incentives to make people work longer and become more productive (Hossman et al., 2008)

(Eberstadt and Groth, 2008). Getting back some of its already retired workforce is key for Western Europe's future prosperity and competitiveness (Eberstadt and Groth, 2008).

3.3 Northern America's Demographic Future

Table 6. North America demographic data in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
North America	401	17%	2.06	1%	40	6%	0.7%	-0.1%
Canada	39	17.1%	1.8	6%	43	8%	0.5%	-0.1%
USA	362	16.6%	2.1	0.4%	39	6%	0.7%	-0.1%

Source: UN Population Prospects (2010)

As Canada's fertility rate is below reproduction level population growth increasingly relies on immigration (Statistics Canada, 2010: 41ff). Moreover, as the baby boomers reach the age of 65 and life expectancy is steadily rising, the median age will increase too (Statistics Canada, 2010: 44). Canada's age distribution reveals that the working force (15 to 64 year olds) represented 69% of its population in 2009. This Ratio will rapidly decline to approximately 60% in 2030. Afterwards it will remain relatively stable. (Statistics Canada, 2010) This trend is also represented in the old age dependency ratio. The ratio for Canada was 20:100 in 2009 and will jump to 39:100 (Statistics Canada, 2010).

On top of a fairly big population increase, the structure of the population in the United States will change significantly. In 2010, 60 percent of the U.S. population was between 20–64 years old. By 2030, as the baby boomers age, the proportion of people in working age will drop to 55 percent (US Census Bureau, 2010). In 2010, 22 people aged over 65 were dependent on 100 '20 to 64 year olds'. This ratio will change to 35:100 in just 20 years, meaning a growth rate of 59%. However, in absolute figures the 15-64 population is still projected to grow in the coming decades, resulting in an increase of over 20 million by 2030 (Eberstadt and Groth, 2008). Therefore, immigration will play an important role, as the country's aging will be noticeably slowed by the immigration of younger people and will consolidate the US working population (US Census Bureau, 2010).

3.4 Africa's Demographic Future

Africa, especially Sub-Saharan-Africa will face tremendous challenges in the coming years. For example 33 out of the 48 least developed countries are situated in this region and their population is projected to increase by around 50% till 2030 (Sippel et al., 2011). The labour market will have to be ready to accommodate this increase in order to maintain social security (Kronfol, 2011).

Table 7. Africa demographic data in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
Africa	1'562	53%	3.59	-18%	22	15%	8%	-2.3%
Sub-Saharan	1'354	58%	3.83	-20%	21	14%	8%	-3.6%
Eastern	527	62%	3.76	-21%	21	16%	6%	-3.2%
Western	496	63%	4.28	-18%	20	10%	9%	-4.0%
Middle	200	58%	3.79	-27%	21	19%	13%	-4.0%
Northern	275	31%	2.32	-16%	30	25%	3%	-1.3%
Southern	64	11%	2.07	-16%	28	17%	4%	-2.2%

Source: UN Population Prospects (2010)

The high population growth and fertility rate, mainly in East-, West- and Middle-Africa, can partly be explained by the culturally embedded desire to have a large family. It is also partially the result of insufficient family planning due to poor education and limited access to contraceptives. Western Africa will have a slow transition towards the usage of modern means of family planning, as demonstrated by the very high fertility rate in Table 7. Moreover, it is proven, that when children mortality decreases, people tend to have less children. This pattern can be observed for Middle Africa (Sippel et al., 2011), (UN Population Prospects, 2010).

In terms of Africa's population structure the dependency ratios are as they could have been expected. The old age dependency ratio with 14:100 is higher for Northern and Southern Africa compared to 7:100 for Eastern, Western and Middle Africa in 2030. A significant regional variation exists in the changes of these ratios between 2010 and 2030. As the ratio of Northern and Southern Africa increases by roughly 57%, it nearly does not change for the other regions. Meaning that, in relation to their older population there will be much less working people in the North and South of Africa. Fertility and children mortality rates in Africa compared to other parts of the world are particularly high. The children dependency ratio will provide some explanatory power to point out differences between African regions. Again Northern and

Southern Africa's ratios with about 60:100 substantially differ from the rest of Africa with a ratio of roughly 103:100 in 2030, whereas Western Africa has the highest ratio with 106:100 which is in line with the high fertility rate. High old-age or high children dependency ratios may hamper economic development, as in both cases the work-force has to take care of a relatively larger proportion of the rest of the population (Sippel et al., 2011), (UN Population Prospects, 2010).

3.5 Asia's Demographic Future

The population change in Asia is unique, because of the speed at which it is happening and the effects it has on the global economy and regional social dynamics (Abdel-Ghany, 2008: 567f).

Table 8. Asia demographic data in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
Asia	4'867	17%	1.99	-9%	36	22%	3.7%	-1.1%
Eastern	1'625	3.3%	1.59	2%	43	22%	1.6%	-0.6%
Central	74	22%	2.14	-13%	31	26%	3.7%	-1.1%
Southern	2'142	25.7%	2.15	-16%	31	26%	5.4%	-1.5%
South-East	706	19%	1.90	-11%	35	26%	2.1%	-0.9%
Western	320	38.1%	2.49	-13%	30	22%	2.1%	-1.0%

Source: UN Population Prospects (2010)

A majority of the Asian countries will face an ongoing decline in fertility rate see Table 8, partially because of the persistent reduction in children mortality due to advances in healthcare and medicine. This improved healthcare serves as an explanation for an increasing life expectancy and therefore higher median age (Abdel-Ghany, 2008), (UN Population Prospects, 2010), (Attané and Barbieri, 2009). Besides that, the successful introduction and forceful implementation of family planning programmes in the 1970s in some Asian countries such as China, Thailand, and the Republic of Korea resulted in a drastic decline in fertility rates (Abdel-Ghany, 2008). These measures will continue to influence the population development between until 2030.

An increasing median age and declining fertility rate will also influence the population structure of Asian countries. In 2030 the old age dependency ratio in Eastern Asia with 28:100 is the highest, whereas all the other regions ratios are roughly around 15:100. However, attention has to be directed to certain exceptions such as Japan

(57:100), the Republic of Korea (40:100) and Singapore (40:100). The workforce of these societies will have to cover an increasingly high proportion of costly elderly people (Abdel-Ghany, 2008), (Attané and Barbieri, 2009). This relative reduction in the workforce will reduce the availability of cheap labour and therefore challenge the competitive advantage Asia had over the past decades as well as cause reasons for migration (Abdel-Ghany, 2008).

As India is going to be the most populated country by 2030 it is worth examining some of the country's particularities (Economist Intelligence Unit C, 2011), (UN Population Prospects, 2010). Some of India's major issues will be to improve healthcare, a strong urbanisation resulting in infrastructure needs, the role of women in the society, which leads to an unbalanced gender distribution and a strong ongoing population growth. This will result in an increased environmental degradation and a growing strain on water and food resources (Economist Intelligence Unit C, 2011). Furthermore, in order to sustain social stability it becomes key that India's education system accommodates the masses of young people so that they have the skills needed on the job market (Economist Intelligence Unit C, 2011), (UN Population Prospects, 2010).

3.6 Latin America's and the Caribbean's Demographic Future

In comparison with other regions of the World, Latin America and the Caribbean have average demographic parameters: roughly similar to those in Asia, much lower than those of Africa, but still a good distance above those of more developed countries. Intra-regionally, demographic rates vary greatly between countries (Oxford Analytica, 1999), (UN Population Prospects, 2010).

Table 9. Latin America and the Caribbean demographic data in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
Lat. Am. & Carr.	701	19%	1.89	-13%	35	25%	1.7%	-0.7%
Caribbean	46	11%	2.00	-11%	36	20%	2.9%	-1.2%
Central America	194	24%	2.03	-16%	32	27%	1.5%	-0.6%
South America	461	18%	1.82	-11%	35	25%	1.6%	-0.7%

Source: UN Population Prospects (2010)

Fertility rates will generally not be very far from Northern American levels in 2030 as shown in Table 9, especially in countries like Costa Rica, Cuba, Mexico and Brazil. However, there will also be countries where fertility rates will remain far above Northern American rates, for example Bolivia, Guatemala, Haiti, French Guiana and Paraguay. On the other hand, mortality is still higher than in Europe (UN Population Prospects, 2010).

As fertility is declining and especially the median age is quickly increasing the population structure will be prone to these changes. The old age dependency for most Latin American and Caribbean countries shows a ratio around 20:100 in 2030, whereas poorer countries tend to have lower ratios (UN Population Prospects, 2010). Notably, the ratio is higher and fertility in general is lower than in Asia, resulting in a heavier impact on Latin America's workforce and society, with particular influence on savings, investments and health systems (Oxford Analytica, 1999). In general, the overall regional outlook shows a continued demographic transition, with a much faster rate of change than experienced in the more developed countries, and persistent intra-regional and sub-national inequalities (Oxford Analytica, 1999), (UN Population Prospects, 2010).

3.7 Oceania's Demographic Future

Table 10. Oceania demographic data in 2030 with percentage change between 2010 and 2030

Region	Population (in mio)		Fertility		Median Age		<5 Mortality per birth	
Oceania	47	29%	2.36	-4%	36	9%	1.8%	-0.7%
Austr. / N.Z.	33	24%	2.02	2%	40	8%	0.5%	0.0%
Melanesia	13	45%	3.01	-17%	25	19%	3.5%	-1.7%
Micronesia	0.7	23%	2.28	-14%	32	21%	1.8%	-0.9%
Polynesia	0.8	16%	2.44	-14%	30	22%	1.5%	-0.4%

Source: UN Population Prospects (2010)

Fertility in Australia and New Zealand will be below replacement level until 2030. It is forecasted that the population increase will mainly be attributed to net immigration (Economist Intelligence Unit A/B, 2011), (UN Population Prospects, 2010). As in many other developed countries population aging will also be an issue in Australia and New Zealand. Although, Australia and New Zealand's aging will be slower than many other OECD countries. (Economist Intelligence Unit A, 2011), (Economist Intelligence Unit B, 2011).

Australia's old age dependency ratio will rise to 35:100 in 2030, an increase of 60% in 20 years and the working-age population is projected to fall as a share of the total population from 67% in 2010 to 65% in 2020 and 63% in 2030 (Economist Intelligence Unit A, 2011). This change in population structure will result in the need to retain older workers in the workforce and to continue attracting immigration. Moreover, the relative growing number of old-aged people will lead the challenges concerning public healthcare and the pension system (Economist Intelligence Unit A, 2011).
New Zealand's expected population growth over the next 20 years is slightly lower than Australia's, but their old age dependency ratios are similar. Nevertheless, there are differences between the two countries. Australia is more attractive compared to New Zealand for immigration, as supported by their higher number of immigrants relative to their population size. Furthermore, New Zealanders increasingly emigrate to Australia, which will further intensify their labour shortage in future. The impact of these changes on the economy **of New Zealand** will only be moderate. The rise in the number of people over the age of 65 years will burden the state with rising health and social security costs. Moreover, productivity and economic growth will slow as the population ages. The labour force will shrink as more and more people will retire and fewer younger people will replace them. This will cause the output growth to drop unless productivity increases at a faster rate than the shrinkage of the workforce (Economist Intelligence Unit B, 2011), (UN Population Prospects, 2010).

3.8 Conclusion – Demographics meets Business in 2030

Demographic projections favour America over Europe in the traditional comparison of the two powers. In 2030 America will have a younger population and a relatively larger share of working people. This will allow for prosperous economic growth and innovation. On the other hand, Europe's population will be old but healthy. Putting the right policies and incentives in place to make people work longer, increasing efficiency and continuously improving knowledge through education will be primordial for the future (Eberstadt and Groth, 2008). Nevertheless, both countries face other challenges, which might significantly interfere with economic growth. While Europe has to find solutions to high public debts, health and pension systems, America is concerned with fiscal uncertainty, weaknesses in the housing market and consumer demand as well as serious debt reduction (WEF B, 2011).

For many African countries, the key question will be whether they are able to take advantage of their demographic situation and turn it into a demographic dividend as the Asian-Tiger-Countries did in the last decades. To achieve this, a high proportion of the workforce relative to the rest of the population is necessary. Based on the demographic projections explained before, it seems unlikely that many African countries can achieve a particularly advantageous ratio as fertility will remain high until 2030.

Furthermore, to take advantage of this situation people need to be employed and unemployment is a currently a big issue in Africa (Chapter 4 is going to be more specific on this). Investments in basic things such as food, health and security, as well as better education, a stable political and economic environment, reduction of corruption and infrastructure are absolutely crucial to enable further job creation and ultimately wealth creation.

As explained in chapter 1 better health has a strong influence on GDP particularly in poor countries. Besides that, with above-average GDP growth rates Africa is projected to make up a much larger share of the Worlds GDP by 2030 (Sippel et al., 2011), (WEF B, 2011), (Citigroup, 2011).

Asia will not only hold the largest population share in 2030 but will also be a major economic power. China's GDP is projected to account for nearly 16% and India's for 5% of the World's GDP in 2030. Also South Korea will continue its economical rise. On the other hand, Japan is forecasted to be the big loser, as Japan's GDP will decrease steadily relatively to other countries in the coming years. This is mainly due to Japan's reluctance to allow mass immigration (Economist Intelligence Unit D, 2005).

Latin America will only be able to hold its share of world GDP at a constant level, which implies that they will grow at the world average rate (Citigroup, 2011). Brazil can strengthen their global position as one of the world's leading economics if they can successfully improve education and fight monopolies amongst other factors.

4. Entrepreneurship, Demography, Society

As in the previous relations established linking health to business, the effects of demography on entrepreneurship and vice versa are not easy to understand. It is widely recognised that the key driver for entrepreneurship can be seen in the individual stepping into self employment. The entrepreneurial choice is based on opportunities given through demand and supply factors in which the entrepreneur embeds his business model; Infrastructure, access to capital, education and low corruption are some important factors encouraging entrepreneurial ventures.

Focusing on particular on the region of Sub-Saharan Africa (SSA), we argue, that unlocking the demographic dividend through entrepreneurship, its antecedents – education and business financing – play a crucial role. While education provides for efficiency and thus competitiveness, sufficient business financing assures for an optimal level of businesses. Overall entrepreneurship helps providing jobs which is crucial when it comes to unlocking the demographic dividend.

Independently of how developed an economy is, entrepreneurship is seen as a critical factor from a policy perspective. Factors that lead individuals to enter and exit the status of an entrepreneur are considered crucial: For example, the Lisbon Strategy initiated by the European Union (EU) in 2000 – which was re-launched in 2005 and is now called the Europe 2020 Strategy – stresses the view that the promotion of small and medium-sized enterprises – is essential in enhancing the EU's competitiveness (Van der Zwahn, 2007).

In the US, the federal government promotes self employment as a path for families to leave welfare and unemployment insurances (Vroman 1997 in Robb and Fairlie, 2007). Considering a country's wealth distribution, entrepreneurs are seen as having more upward than downward mobility when compared to employed workers (Bradford 2003, in Robb and Fairlie, 2007). In particular regional economic performance is positively influenced with respect to innovative start-ups (Audertsch et al. 2006 in Bönte et al. 2007). This can be seen as evidence that entrepreneurship from a policy perspective is considered to be stimulating for an economy.

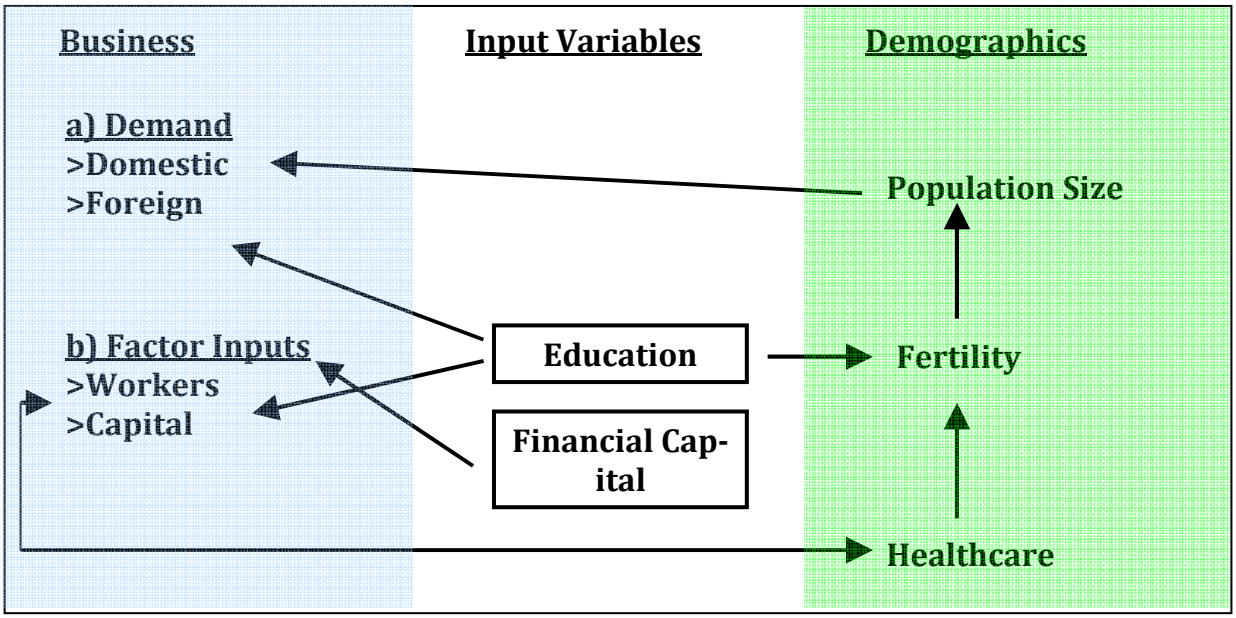
4.1 Importance of Entrepreneurship in an Economy with High Demographic Dynamics: The Sub-Saharan Region

It has been shown in Chapter 3, that Africa is the Region with the highest demographic dynamics. Drawing upon the analysis of the population outlook in 2030, Afri-

ca is expected to undergo substantial changes in the years to come. This holds true when looking for instance at the factors introduced: The greatest growth in terms of total population, a significant decline in the fertility rate, and an increase in life expectancy predicted on the basis of UN data (UN Population Prospects, 2010). While entrepreneurial opportunities as a function of shifts in expected demand in business may arise, we argue that entrepreneurship is in line with reducing demographic uncertainty, especially to the upper bound defined by fertility rates.

In particular one can see, that the Sub-Saharan Region provides for an accentuation of these dynamics. The high population growth rates are subject to high uncertainty. This might provide for qualitative answers in terms to how to tackle the challenges of the region.

Figure 2: Qualitative Model of Entrepreneurship and Demographics. Source: Own display.



In the following it is focused on two factors: financial capital and education, driving entrepreneurship and demographics. The selection taken should not indicate that there is no other factors of importance. Much more the Global Competitiveness Report of the World Economic Forum (WEF, 2010) has focused on 12 pillars of competitiveness, that should provide for efficiency. However in particular for the Sub-Saharan region business financing has been shown to be a major concern. At the same time the literature shows a clear link between education, business and demographics.

4.2 Education

Education in the Model (Figure 2) is seen as a central driver for entrepreneurship and for demographics at the same time. While education provides for efficiency in the workforce, it permits the entrepreneur to see business opportunities available and evaluate them more properly. At the same time, in particular secondary education for women is seen as crucial with respect to driving down fertility rates.

4.2.1 Better Evaluation of Entrepreneurial Opportunity

How do entrepreneurs decide on whether to open up businesses? What is crucial that entrepreneurs stay in business? The entrepreneurship literature has put much emphasis on the entrepreneur as an individual. Entrepreneurship is linked to the individual decision of the entrepreneur to engage into the endeavour of founding a business. In an economic consideration this is a choice among options, determined by the economic opportunity given through demand and factor inputs (Figure 2): As a starting point for entrepreneurship an economic opportunity must present (El-Namaki, 1998 in Aruwa).

For the employed individuals, becoming an entrepreneur depends on whether the entrepreneurial income is at least equal to the wage previously earned (Kihlstrom and Laffont, 1979 in Bönte et al. 2008). For the unemployed, individual entrepreneurship is a way to get work.

The role of education kicks in when “objectivising” interpretations of entrepreneurs; Objective circumstances are interpreted in a subjective manner when engaging in entrepreneurship (van der Zwan, 2011). Differences in subjective interpretation originating from different backgrounds, for instance cultural backgrounds, can affect the propensity to open up new businesses. Whether the individual becomes an entrepreneur or not, is linked according to Bönte et al (2007) to three factors: human capital, risk aversion and discounting of time. Because those factors change as a function of the entrepreneur’s age, the likelihood of businesses to be started in a region can be seen as a function of its demography.

4.2.2 Education leads to Higher Efficiency in a Business Environment

In their knowledge based view on start-up experience, Debruille et al (Working Paper) summarise the literature distinguishing between general human capital, encompassing formal education and management experience, and specific human capital

being industry and start-up experience. The literature has found general human capital to be advantageous for coping with complex problems throughout entrepreneurship: Higher education leads to a quicker linking of facts with pieces of information (Debourille, No Date). Vesper (1990, in Aruwa, No Date) argues that technical and business capabilities provided through education should be part of the abilities forming the skill set in a startup.

Among the infrastructure to make substantial impact on the entrepreneurial environment, the existence of universities and R&D programmes to achieve a technically skilled labour force is needed (Gartner, 1985 in Aruwa, No Date). Adapting the educational system, policy can thus influence the amount of entrepreneurship within an economy.

Sippel et al. (2007) suggest that a focus for the Sub-Saharan Region should be put on Education (besides healthcare and job creation): In particular secondary education for women drives down fertility rates and can change the dynamics of fertility rate adjustments (*Cleland, No Date,* Jeffery, and Basu, 1996 in Cleland, No Date).

The literature states a positive correlation between venture performance – in terms of profitability and survivorship – and education (Gimeno et al, 1990 and Bosame et al. 2002, in Debrulle, No Date). Focusing on high tech companies, which are considered to be knowledge intensive, Bönte et al (2007) find that in particular the age group of 20-29 years in their early career stage engage into entrepreneurship because of their high knowledge that is readily available from education. Non-knowledge intensive start-ups are founded quite independently from age in individual's careers (Bönte et al, 2007).

In terms of the activity that micro-entrepreneurs selected for their micro-enterprise, it was found that for Africa the most put very little thought into which activity they should pursue; very few conducted any type of market research or competitive analysis of the market in which they wished to make a living (Wheeler & Roy, 2006). This result is astonishing in the light of an educational report from 1990, stating that changes designed to enable school leavers to be more employable in the formal sector of the economy or to develop entrepreneurial skills that would allow them to become self-employed after leaving school. Additionally the fact that inequality of access to educational systems based on regional, ethnic, socioeconomic, and gender factors were not going to be met by the year 2000 indicates that changes to the educational system are slow (Dorsey, 1990).

4.2.3 Education leads to Accessing International Markets

From an economic perspective demand can be derived from either domestic demand or international demand from outside the country of the venture. In the model of Figure 2, high demographic growth in a country or a region increases domestic demand. At the same time education is seen as a driver towards accessing international markets;

According to Rialp et al (2008, in Debrulle et al.) it holds no more true that ventures start out locally and then expand internationally. This revised belief of the nineties, is good news for developing and emerging countries as entrepreneurs can directly supply their services to the world market when starting off their business. An open market as a policy perspective may thus help generate opportunities for entrepreneurs.

In particular Debrouille et al (working paper) links human capital of the entrepreneur to internationalisation in the venture's early stage: They find that formal education, which they measure as the highest degree of the entrepreneur, is positively correlated with export activities, which provides for the link in Figure 2. Furthermore a result of Bönte et al (2007) suggests that younger entrepreneurs enter significantly more often for businesses in the high-tech area; a finding that they link to the fact that high-tech start-ups benefit from more recent education.

4.3 Business Finance

The appropriate amount of financing for start ups can be seen as a critical factor to achieving an optimal amount of entrepreneurship in an economy. George and Prabhu (2002, in Aruwa) highlight the role of developing financial institutions to foster entrepreneurship in emerging economies through lending policies and prioritisation of national industrial development goals. Financing with the associated cost is seen as crucial because it determines, whether an opportunity in a business plan is a real opportunity in terms of generating more than the cost of capital.

Robb and Fairly (2007) have researched that Afro-Americans' businesses are often underfunded when compared to businesses of white Americans. While this might be due to the potential likelihood of success allocated to the particular business, Robb and Fairly (2007) have shown that Afro-Americans have less assets that might serve as a collateral. These constraints in financing can eventually cause businesses to be less successful and thus lead to discriminating developments. However Van der

Zwan (2011) states that the contradictory findings in empirical studies on credit rationing reflect the difficulty of implementing and measuring this concept.

4.3.1 A Link Towards Risk Preferences

The discount rate applied when evaluating business opportunities from a financial perspective, depends on the entrepreneurs risk preference. Van der Zwan (2007) highlights that risk averse people are less likely to have a preference or intentions for self-employment as compared to more risk loving individuals.

Risk is a factor that is distributed differently among countries where stigmatisation of failure is a crucial determinant to individuals willingness to take the risky path of entrepreneurship (2007). Risk has to be set into the context of reward. The latter might suggest that in differing cultural contexts same objective factors lead to more or less attractiveness for the individuals in the respective environment. “Societies simply value entrepreneurial careers differently” (Van der Zwan, 2007).

With respect to an individual’s time preference, Lévesque and Minniti (2006, in Bönte et al 2007) argue, that the opportunity cost of time is increasing with increasing age; the reason being an individual’s constrained lifetime. This is equivalent to an increase in the interest rate when discounting over time. In other words businesses for older entrepreneurs need to have greater future cash-flows as compared to younger entrepreneurs.

Freytah & Thurik (2007) argue that life expectancy has a negative impact on entrepreneurship because high life expectancy can be interpreted as a proxy for security and high security is negatively correlated with the incentive to become an entrepreneur. A relatively low life expectancy in Africa is advantageous in this sense.

4.3.2 Micro Credits – Financing for the Very Poor

Micro credits is a concept that has been started in Bangladesh (India) by the Grameen Bank. In particular for very poor people micro credits have proven to work as an appropriate mean to get financing. In this way micro credits as a concept have got well known to the investment industry.

Unlike traditional credits, micro credits are not based on collaterals. The process is running through social ties based on mutual trust. This kind of regulation mechanism is linked to distribution points for micro credits being local representatives staying in a specific village for a long time. Micro credit institutions prefer to give money to self help groups (SHG): Collective responsibility can be seen as a distribution of risk. Ad-

ditionally in this way the development reaches out to more people. Groups are normally organised through a responsible leader and should again foster individual's ability to organize and lead. (Alamban, Interview)

Micro credits have caught interest for them explicitly supporting female entrepreneurship. It has brought to light an underestimated potential of female self-employment. "Notably, the microcredit industry has proven on a large scale that women are more trustworthy than men in terms of repayment conduct" (Armendáriz and Morduch, 2000 in Agier and Szafaraz, 2011). This is linked to the fact that in poverty the man sometimes gives up; If everything goes wrong it is usually the women that take control (Alamban, Interview).

4.4 Entrepreneurship in SSA – Unlocking the Demographic Dividend with Micro Credits

With business financing and education, two powerful levers are at the heart of this analysis under high demographic dynamics. Unlocking the demographic dividend – as the Asian Tiger States have shown – can be done through investments into healthcare, better governance, family planning and education (Sippel, 2007). Clearly the literature has pointed out that Women play an important role in those aspects: "The World Bank (1995), writing on demographics and labour supply, notes that although no direct link exists between economic development and women's labour force participation, rapid development is often accompanied by higher female participation, higher levels of schooling for girls and lower fertility rate" (Sackey, 2005). In particular Sippel et al (2007) suggests to improve on secondary education as this reduces the fertility rate. At the same time it is said that women invest into more and more equal education of their kids.

The current development of micro credits as a business models thus is beneficial to build up solid wealth, triggered by a potential release of a demographic dividend in SSA. Through rejecting the basic methodology of traditional banking based on collaterals, micro credits go beyond a mere credit: They interlink a social investment criteria with a grant to capital access. – The Grameen Bank as the innovator in the area of micro credits giving much priority for building social capital when giving access to micro-credits (Grameen Bank, 2011). Given high credit rates coming in through micro credits, this would suggest that entrepreneurial activity is much

stronger for young people that can take more risks. However research on risk preferences in a state of higher unemployment should be part of a further analysis.

It seems as micro credits provide a road out of joblessness: “A significant trend has been growing self-employment among women (and men), especially among those who have failed to secure paid jobs. For example, the proportion of self-employed among non-agricultural women workers doubled in Sub-Saharan Africa (excluding Southern Africa) from 44 per cent in 1970 to 90 per cent in 1990. The proportion also increased in Northern Africa, South America, Southern Asia and Eastern and Southern Europe (United Nations, 2000a). Many of the self-employed women are in micro and small enterprises, rather than large companies. […] The available evidence suggests that own-account work is more out of need than choice, and that those who work from economic necessity have higher fertility than those who work because they want to do so. “ (Lim, No Date)

The success of micro credits – some major European banks have started to use them – shows that this might provide an eventual way out of poverty. The ability of micro credit financing in a high unemployment environment allow for an increase in entrepreneurship.

Sippel et al (2007) suggest that for Africa initially entrepreneurship in non-knowledge intensive areas should be supported. Educational systems – for instance financed with a demographic dividend – combined with lower wages can boost export oriented high-tech start-ups. At the same time opportunities to export products and services are given: The fact of highly developed economies have very steep societal age pyramids lead to high pension contributions of the working force. Labour embedded in such a system has to generate high revenues for intergenerational contracts, freeing up opportunities for products and services from developing countries.

5. Conclusion

The 2030 population scenario outlined in this paper – based on the UN Population Prospects (2010) – suggests highest dynamics in Africa and in particular the Sub-Saharan region. Whereas the Asian Tigers have been through unlocking the demographic dividend, Africa is still ahead of this challenge. Central elements therefore have been identified by healthcare, education, governance and job creation, followed by social security systems.

In particular health and economic growth are strongly correlated, but the relation differs for rich and poor countries. Governments in poor countries should invest in health, as a mean of raising overall productivity. However in rich countries the relation is inverted and income drives health, suggesting that it might be best for policy makers to invest in raising productivity directly.

In particular for the case of very high demographic dynamics, education is seen as a central element: On the pure business side (entrepreneurship) it can increase productivity of workers – a central element to competitiveness on (open) markets. In this way education provides for an opportunity to link start ups in an early stage with exports. For demographics it has been shown that in particular secondary education for women lowers fertility rates.

Business Funding is seen as one of the most critical components for the Sub-Saharan region for doing and thus raising businesses. Much more under-financing would impact success and survival rates and thus endanger job certain. As a very tempting solution, micro finance as a rising concept brings together education and financing for the very poor. Emphasising the role of women this approach has great potential to reap the benefits of the demographic dividend.

While demographic dynamics lead to tremendous population changes worldwide, much of the solutions to the challenges are still open, in the hands of politics, companies and the public. However it is in the interest of a global society to tackle these issues. The fact that dynamics are exponential functions makes it extremely important to acting sooner than later.

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