

What kind of growth is sustainable?

A Presentation of Arguments

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Table of Contents

1	Introduction	4
2	Seven terms you will always come across in growth debates	5
2.1	<i>Quantitative growth</i>	5
2.2	<i>Economic growth</i>	5
2.3	<i>Gross Domestic Product (GDP)</i>	6
2.4	<i>Qualitative growth</i>	6
2.5	<i>Quality of life</i>	6
2.6	<i>Wealth</i>	6
2.7	<i>Sustainable Development</i>	7
3	Seven most common arguments for economic growth	7
3.1	<i>Growth enhances prosperity</i>	8
3.2	<i>Growth secures and creates jobs</i>	8
3.3	<i>Growth fosters productivity and helps to survive in the global market competition</i>	9
3.4	<i>Growth enables investments in environmental protection</i>	9
3.5	<i>Growth facilitates public debt servicing and financing social welfare systems</i>	10
3.6	<i>Growth defuses distribution conflicts and reduces poverty</i>	10
3.7	<i>Growth is perceived as progress</i>	11
4	Seven reasons why economic growth can be problematic	12
4.1	<i>Growth can lead to over-consumption without increasing individual and overall wellbeing</i>	12
4.2	<i>Growth has increased the speed of work and related levels of stress</i>	13
4.3	<i>Growth may foster technological progress, but also increases the chance of negative consequences</i>	13
4.4	<i>Growth can contribute to environmental destruction</i>	14
4.5	<i>Growth may lead to negative consequences of capital formation</i>	16
4.6	<i>Growth policies increase inequalities</i>	16
4.7	<i>The focus on GDP growth as the main macroeconomic goal jeopardises development</i>	17
5	Seven engines of growth	18
5.1	<i>Consumption</i>	19
5.2	<i>Labour</i>	19
5.3	<i>Technological progress and innovation</i>	20

5.4	<i>Availability of energy and natural resources</i>	20
5.5	<i>Capital formation</i>	20
5.6	<i>Global trade and finance</i>	21
5.7	<i>Institutional Framework</i>	21
6	Seven reasons why growth may not continue forever	22
6.1	<i>Consumer restraint</i>	23
6.2	<i>Demographic change and a shrinking labour force</i>	24
6.3	<i>Decreasing productivity and international competitiveness</i>	24
6.4	<i>Environmental limits to growth: sources, sinks and services</i>	25
6.5	<i>The instability of financial markets and increasing debts</i>	26
6.6	<i>Rising inequalities</i>	26
6.7	<i>The belief in growth diminishes</i>	27
7	What are the pillars of a growth in quality of life?	27
7.1	<i>Changed patterns of consumption</i>	28
7.2	<i>New forms of work</i>	28
7.3	<i>Changed investment patterns</i>	29
7.4	<i>Limits to resource use</i>	29
7.5	<i>A balance in different forms of capital</i>	30
7.6	<i>More equality, less poverty</i>	31
7.7	<i>Measuring what matters</i>	32
8	Conclusions	33
9	References	35

1 Introduction

Economic growth has been a success story. Over the last 50 years millions of people in the Western world and lately also in the emerging economies have become wealthy. Many people today enjoy health and living standards their parents could not have imagined. Growth has delivered benefits for the last decades but today unintended negative side-effects become increasingly apparent.

Many people in affluent countries no longer feel the benefits of further growth. People increasingly feel insecure about their jobs, pensions and savings. Often they suffer from work-related stress and have difficulties to balance family and job. In addition the natural environment deteriorates rapidly. Climate change and biodiversity loss are amongst the biggest threats to modern civilisation. Books such as ‘100 animals to see before they die’ sadly illustrate the trend.

The affluent world still has many problems (unemployment, budget deficits) not to speak from the problems people suffer in the rest of the world (hunger, wars, dictatorships etc.), but apparently from an economic perspective, there seems to be only one contribution to the solution: economic growth. In political and economic circles, high growth rates are commonly still considered an essential prerequisite for our future development.

There are many pro and beyond growth arguments and the debate about the limits to growth is getting of age. Throughout the last 40 years most arguments remained the same, but the way they are being debated in the political and scientific communities is in flux. Dennis Meadows, one of the founders of this debate, described the evolution of the opposition to limits to growth in four phases:

1970s: There are no limits.

1980s: There might be limits, but they are far away.

1990s: The limits might not be too far away, but the market will solve the problem.

2000s: The markets might not function, but technology will save us.

This development indicates a tendency to postpone the limits to or quality of growth debate. Due to differing world views and visions for the future of politicians and citizens, scientific paradigms and vested interests, the debate has not reached significant scientific and societal consensus.

In the recently started 2010s the discussion has reached a new stage. Today, many argue that a continued focus on economic growth alone in rich countries may jeopardise our future development. Key questions against this background are: Does economic growth still help solving problems we face (such as unemployment, rising poverty, the destruction of natural resources) or is economic growth rather the cause of these problems? And what options do we have for a different kind of growth?

The following presentation of arguments aims to provide stimulus for this discussion. It serves to equip its readers from public administration to politics, science, research and civil society, with prevailing and often used arguments relating to the growth debate. The purpose of this article is to offer a rationale, that is, to present a basket of arguments which are useful to keep in

mind in debates about economic growth. The arguments are not meant to provide definite answers – neither public nor scientific debate has reached a conclusion yet; they are sometimes provoking and one-sided in order to spur debate. Overall, however, we intend to present a broad range of arguments around the theme. And we do not focus on the global dimension of the issue – growth in emerging and developing economies – but will certainly treat them as a significant factor in the general set-up.

The presentation of arguments is structured in seven sections with seven lines of arguments each. We start with defining seven terms that are important for our presentation (section 1). We then present seven reasons that are frequently brought forward for a ‘need’ of economic growth in modern societies (section 2) before we deal with the negative aspects often described as consequences of growth (section 3). But apart from these reasons why people call for or against economic growth we will ask and explain the drivers of growth – and why it is slowing down. Therefore, chapter 4 explains seven ‘engines’ of growth and chapter 5 explains why these engines weaken. Following from this analysis, we propose seven ideas how a more qualitative growth – or a growth of quality – could look like (section 6) before we come forward with conclusions (section 7).

Let us start with section 1: seven important concepts often found in the growth debate.

2 Seven terms you will always come across in growth debates

The next paragraphs describe seven terms that are particularly relevant to the discussion on growth and especially important for an understanding of this Presentation of Arguments. These terms are quantitative, qualitative and economic growth, GDP, quality of life (or well-being), wealth and sustainable development.

2.1 Quantitative growth

Growth describes the change of a certain indicator over time, the size of a child’s body, the number of people in a country or economic activity. Growth is often measured in percentage terms, implying exponential growth. For instance, a virus typically spreads exponentially – first into two daughter viruses that then split into four, that split into eight and so on until an essential nutrient is no longer available. Linear growth, on the other hand, means that a quantity increases by the same amount in each time period. For example, if the population of a country increases by 20,000 people annually, this implies linear growth. Growth can be positive (increase), zero or negative (decrease or de-growth). The “quantitative growth paradigm” (Steurer, 2010) has emerged in the 1950s and was shaped by neoclassical economists such as William Nordhaus and Robert Solow. In this article, where this term is not further specified, we use growth in the meaning of ‘economic growth’.

2.2 Economic growth

Economic growth can be generally defined as a rise in the economic performance of an economy (Gabler, 2011). In other words, economic growth refers to the relative change of the size of an economy from one period to the next. Gross Domestic Product (GDP) is the most commonly used measure for economic growth.

2.3 Gross Domestic Product (GDP)

According to the United Nations System of National Accounts (SNA) GDP is the total output of economic goods and services produced within a country as measured in monetary terms. To be precise, GDP is defined as “an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). The sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers’ prices, less the value of imports of goods and services, or the sum of primary incomes distributed by resident producer units” (UN, 2010). In monetary terms, GDP grows when prices rise and when the production of goods and services increases. ‘Real GDP growth’ focuses on the latter and deducts inflation from growth in monetary terms. This basically means GDP is a measure of the size of an economy. It shows the economic performance of a country during a given period (usually a year) – nothing more and nothing less.

2.4 Qualitative growth

Qualitative growth is a colourful term that is somewhat more ambiguous than economic growth. The term suggests that an improvement in quality may go hand-in-hand with quantitative economic growth, but by no means has to. Often, however, qualitative growth is taken to mean economic growth that takes into account other (social, ecological, etc.) aspects as secondary factors. As such, the “qualitative growth paradigm” (Steurer, 2010) that emerged in the 1970s criticises the quantitative growth paradigm but does not entirely refuse it. The underlying assumption is that an absolute decoupling of economic growth and resource use is possible; however not alone through market mechanisms but due to strict environmental policies. As a consequence, it is not necessary to abandon growth but to design and optimise it in a qualitative way. Recent interpretations of qualitative growth are for instance ‘sustainable growth’ or ‘green growth’. However, when we talk about qualitative growth in this presentation of arguments, we mean an increase in the quality of life.

2.5 Quality of life

A person’s quality of life is a combination of objective living conditions and subjective wellbeing (Rauschmayer et al, 2010). In principle, objective conditions such as health, education, income, political voice or environmental conditions are constitutive of subjective perceptions. The subjective component of quality of life is wellbeing. Wellbeing is all about how people feel about their lives. It “refers to emotional states and reflections of meaning in life based on the subjective experience of one’s fulfilment of needs. Its hedonistic part reflects the pleasure experience and is linked to emotional well-being, its eudaimonic part reflects the striving to realize one’s personal and social potential” (Rauschmayer et al, 2010, p10). This integrated quality of life approach offers a holistic and comprehensive concept to the observation of material and non-material values (Rauschmayer et al, 2010).

2.6 Wealth

There is no universally agreed definition of wealth. In economics, wealth usually refers to the abundance of resources and possessions or the control of such assets, usually in the form of money or personal property. Economic terminology clearly distinguishes between two variables: stocks and flows. For example, the total amount of money one has on a bank account

refers to a capital stock, measured in €. By contrast, the annual income one receives on this financial capital stock, i.e. the interest, is a flow variable measured in €/year.

2.7 Sustainable Development

Development and growth is not the same thing. The UN's Human Development Report 1996, for instance, states that economic growth, if not handled properly, "can be jobless, voiceless, ruthless, rootless and futureless, and thus detrimental to human development. The quality of growth is therefore as important as its quantity; for poverty reduction, human development and sustainability" (UN, 1996). The report goes on to state "that the links between economic growth and human development must be deliberately forged and regularly fortified by skilful and intelligent policy management" (UNDP, 1996). It identifies employment as critical for translating the benefits of economic growth into people's lives. But for this to happen, new patterns of growth will need to be developed and sustained and new mechanisms created to integrate the weak and the vulnerable into the expanding global economy. The main message of the UNDP could thus be put in a nutshell as: Sustainable development is the end, whereas economic growth is a means to reach that end. As such, economic growth is not sustainable without human development.

Numerous definitions have been proposed for the term 'sustainable development' with different foci, priorities, time and space contexts and many interpretations place heavy emphasis on economic growth (Pollitt et al, 2010). By far the most commonly used and well-known definition of sustainable development originates from the Brundtland Commission's report 'Our Common Future' (WCED, 1987). Therein, sustainable development is defined as a development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

We understand sustainable development as "a dynamic process which enables all people to realize their potential and to improve their quality of life in ways that simultaneously protect and enhance the planet's life-support systems" (Forum for the Future, 2000). Though vague, this definition conveys the idea that there are biophysical limits within which society must operate. We interpret sustainable development as an important but unfocused concept such as liberty or justice (Blewitt, 2008), a dialogue of values (Ratner, 2004), a journey (Milne et al, 2006) and last but not least a political process. Sustainable development is not necessarily linked to economic growth.

Equipped with these conceptions, we can now go on and describe why economic growth became such an important concept for economic policies.

3 Seven most common arguments for economic growth

In many political commitments, such as the European reform package "Europe 2020", economic growth is considered to be the primary solution for social, economic and even some ecological challenges. Below are some of the most commonly used arguments for the proclaimed necessity of economic growth.

3.1 Growth enhances prosperity

Real GDP growth is an increase in the value of the production of goods and services in a country. In principle, this enables people to better satisfy their material needs. Material goods are indispensable for basic needs such as food and housing and make our lives more comfortable and enjoyable. As such they are critical for people's physiological well-being. The bottom line of this is that the more prosperous an economy, i.e. the higher GDP, the better off are its citizens in terms of economic prosperity.

The existing mainstream economic view centred on maximum GDP per head or average incomes seems attractive because it links with the assumption that most individuals aspire to increase their income. But while economic growth has brought about a certain extent of prosperity this is only one part of the story. What does prosperity really mean to people?

Psychology, political sciences and religion offer different views of prosperity linked to the search for the good life and good things such as freedom and self-determination. Evidence from psychology even suggests that the consumerist culture with its focus on materialistic values has passed a critical point beyond which materialism is actively detracting from human wellbeing (Soper, 2008; Kasser, 2002, 2008; Lyubomirsky 2008). Economic growth does not necessarily increase individual and overall wellbeing. Large scale empirical studies in almost all developed countries show that large increases in economic growth since the early 1960s have not been associated with an increase in people's happiness (Layard, 2005) (see section 3.1.).

3.2 Growth secures and creates jobs

Economic growth is crucial for both employment and unemployment. This economic tenet is reflected in politics: most political programmes use the term growth in tandem with employment. The European growth strategy 'Europe 2020', for instance, aims to deliver employment as the first of five objectives.

The relationship between growth and unemployment can be explained as a two-step process: First, there is a link between economic growth and the change in employment and second, there is a link between the change in employment and unemployment rates. The first link is determined mainly by economic factors, i.e. employment will rise if growth is higher than productivity gains. Productivity gains mean that the output from a production process increases per unit of input. Labour productivity increases if the same output can be produced in less working hours. The second link is governed by labour market policies and demographic influences (such as the development of the population of working age) (Walterskirchen, 1999). This means the influence of economic growth on employment is higher than on unemployment.

In economics, the relationship between GDP growth and the change in unemployment became known as Okun's law. It says that actual output has to grow faster than potential output (i.e. faster than productivity growth) in order to decrease unemployment. In the sixties and seventies, Okun's law was undisputed. In the eighties and nineties, most politicians and economists explained unemployment by structural factors, mainly by inflexible labour markets, too high wages or too high unemployment benefits (Walterskirchen, 1999). Today, empirical evidence for Okun's law changes from country to country and over time. In Austria, Okun's Law proves fairly true for the last 50 years, that is, per 1% GDP growth, unemployment decreases by 0.5%. However, a decline of unemployment starts at 3% GDP growth and fundamental reductions in

unemployment seem to be only possible with ‘Chinese’ growth rates. Also, Okun’s law does not live up to the complexity of the labour market, as it does not capture the discrepancy between the change in employment and a decline in unemployment as described above. Moreover, it does not distinguish between the long and the short term.

This evidence might cast economic growth as a problem solver for unemployment and the creation of high quality jobs into doubt. The relationship between growth and unemployment is not as straightforward as often assumed. The labour market is a complex institution that is influenced by many variables. Economic growth is only one of them.

3.3 Growth fosters productivity and helps to survive in the global market competition

Economic growth is commonly perceived as an essential driver for technological progress. It is often argued that economic growth increases productivity due to increasing returns. Among economists, this connection is also known as Verdoorn’s Law. A specialization in the production of export products, for example, may increase the productivity level as well as the level of skills in the export sector. This may prompt a reallocation of resources from the less efficient non-trade sector to the more productive export sector, and lead to lower prices for traded goods and higher competitiveness. The productivity change may then, in turn, lead to higher exports and economic growth. Note that this argument actually undermines the typical neoclassical model of growth which assumes that productivity growth can mainly be explained by progress in technology and scientific knowledge.

3.4 Growth enables investments in environmental protection

Innovation may, in turn, make it possible to decouple growth from environmental degradation.

In low-income countries economic activity often causes considerable environmental damage, especially when their development strategy is based on the extraction and trade of natural resources. In industrialised countries, on the other hand, it is widely claimed that pollution levels decline with increasing income, because of their ability to invest in counter measures. This concept is usually referred to as the ‘Environmental Kuznets Curve’ (EKC). Originally, Kuznets investigated the relationship between rising incomes and levels of inequality (see section 2.6) but his ideas have also been applied to the environment. The EKC hypothesizes that environmental degradation increases over time while a country is developing, and then after a certain average income is attained, the state of the environment begins to improve. Although the concept has gained (surprisingly) much attention, empirical evidence showed that the relationship only holds true in very few cases. Air and water quality are the two prime examples where pollution could be decoupled from economic growth in absolute terms. For most of the main pollutants the trends are dammed in the EU (e.g. air pollution caused by SO_x and NO_x). However, this success is mainly due to the long history of environmental legislation in those areas and due to the availability of easy technical solutions. In general, the EKC is strongly contested and cannot be generalised across a wide range of resources and pollutants.

Nevertheless, strategies of “Green Growth” (OECD, 2010) and “Sustainable Growth” (EC, 2010) are gaining support in recent years as a way to consolidate economic and environmental development. Policies to reconcile economic and environmental goals is called “decoupling”, viz. to pursue economic growth while at the same time operate within ecological limits (see section 3.4). While relative decoupling still increases environmental pressures but at lower rates

than economic growth, absolute decoupling is necessary to reduce environmental pressures. We have not observed absolute decoupling in the past, but this does not mean it is impossible. A mix of policies has been suggested to achieve absolute decoupling, such as investing in renewable energy, improving energy and resource efficiency throughout all sectors, developing new green, low-carbon industries and green jobs.

3.5 Growth facilitates public debt servicing and financing social welfare systems

Economic growth is necessary to increase the capital stock. Capital has a number of different meanings; we distinguish between five forms of capital – natural, social, human, financial and man-made capital. Natural capital comprises all natural resources that provide us with energy, raw materials, absorption capacity for waste, as well as cleaning capacity. Human capital includes the physical abilities of humans, their intelligence and knowledge but also other human dimensions that contribute to wellbeing and performance, such as health, education and happiness. Social capital consists of networks among individuals and groups, which can be formal or informal. Established institutions that constitute social capital include organisations, standards, education and information systems. There has been criticism that nature, relationships and humans are described as “capital”. What is interesting in this concept, however, is that it is regarded as a prerequisite for economic production that can receive investment and that translates into economic damage if lost. All forms of capitals are stocks with the capacity to produce flows of output. The maintenance of all five capital stocks is essential for sustainable development.

Especially the accumulation of financial and man-made capital (such as machines, buildings etc.) is based on economic growth and lays the foundations for further growth. By generating more capital and financial resources, economic growth makes it easier for governments to provide public services such as health care, education and pension systems. In times of real GDP growth tax incomes increase disproportionately because many tax systems are designed as progression systems. In principle, this makes it possible to promote and create new public tasks without reducing already existing public tasks. Especially in recent years, the role of economic growth for servicing increased public debt has risen. It is only possible to pay back interest and loans with increased public revenues.

However, it could also be argued that the scope of government action is flexible. There is always space for manoeuvre in governance and policy making. Although challenging, one could look into possibilities to cut certain expenses (e.g. for the military or nuclear research etc.), to redesign tax-systems or to implement big reforms of the pension or health care systems in order to be less dependent on increasing production rates.

3.6 Growth defuses distribution conflicts and reduces poverty

It is often claimed that growth is essential to enable a fair distribution of income and capital assets and to reduce poverty by the ‘trickle-down-effect’. The philosophy behind ‘trickle-down’ is based on the idea that economic growth flows down from the top to the bottom with policies that benefit businesses and the already wealthy (such as tax cuts or breaks). Via an expansion of the private sector, the purchase of goods and the creation of jobs, capital would ‘trickle down’ also to low and middle-income classes that indirectly benefit from the original policies.

By producing more goods and services a bigger cake of real domestic products and related incomes is available. A fair distribution of this additional piece of cake is politically easier in times of constant growth. Higher income groups are more willing to give lower incomes a proportionally bigger piece of the additional cake as long as this does not require having to reduce their own material living standard. Thus, growth helps to mitigate national distribution conflicts and reduces poverty.

The most commonly used approach in economics to refer to equality is income (in)equality. This concept describes the extent to which income, expressed between households, individuals or all individuals, is distributed in an (un)even manner. A widespread theory to describe the relationship between income inequality and economic development over time was developed by Simon Kuznets in 1957. The inverted U Kuznets curve illustrates that economic inequality increases throughout the early stages of a country's development before it begins to decrease after a certain average income is attained.

However, there is widespread criticism that 'trickle-down' policies often do not work. Empirical evidence that show widening income gaps support this view (see section 3.6). Economic growth seems also to hide this tendency: low income groups get more income from year to year (often only in monetary terms not even in real terms), not realising that other groups gain even more. Also the Kuznets hypothesis has caused considerable critique and the links between inequality and economic growth remain a topic of considerable controversy.

Economic theory is ambiguous about the relationship between economic growth and inequality. Many economists perceive income growth and income distribution as two separate things. It is assumed that growth and redistribution happen independently from each other, which implies that growth can be pursued by certain policies, while distribution is adjusted by a different set of redistributive policies. A key question therefore is not whether growth affects distribution or vice versa, but how distributional effects could be integrated into the design of economic policies as a whole (nef, 2006).

3.7 Growth is perceived as progress

For many commentators, economic growth has become synonymous with the progress of countries. "High growth is a cause of national pride; low growth attracts accusations of incompetence in the case of rich countries and pity in the case of poor countries" (Hamilton, 2004, p1). The idea of progress itself is "one of the most important defining values of western civilisation" (Victor, 2008, p5). It has largely become equated with economic progress based on the belief that events are sequential and their sequence leads to improvement. The favoured measure of this economic progress is Gross Domestic Product (GDP).

This conception of progress has worked well throughout history, especially in the second half of the 20th century, but is increasingly called into question. As economic growth today comes with considerable side effects (see section 3) it can be argued that we are no longer in a state of improving our situation. The further high emphasis on individual material wealth in rich societies comes at a high price in the form of environmental, individual and social problems.

The progress made in terms of development, which is an ambiguous term coined by US President Truman in 1947, can be very different at given rates of economic growth, depending

on the starting point from which an economy grows. If the annual per capita income in a poor country is US\$ 5000, 5% growth means US\$ 250 more next year. When per capita income reaches US\$ 50,000 the same growth rate gives US\$ 2500, which is 50% of the poor country's income.

This brings us to deal with reasons why growth can be problematic for several reasons. It will be interesting to see that many of these reasons are in one way or another closely related to the proclaimed reasons why growth is needed.

4 Seven reasons why economic growth can be problematic

Problems associated with economic growth can be observed in the ecological sphere, as well as the social and economic sphere. Below we describe negative growth facets related to consumption, labour, technological progress, the environment, capital formation, inequality and development.

4.1 Growth can lead to over-consumption without increasing individual and overall wellbeing

We live in a high consumption world. Modern lifestyles have led to a level of consumption that is often far in excess of what is needed for survival and health and that often leads to negative psychological, social and environmental side-effects. While economic growth has brought about rising living standards and as such prosperity in one sense of the word, an increase in materialistic goals and values also has negative effects. Consumption has gained an increasingly important role for individual's to communicate with others about status, identification, social affiliation, feelings and social comparisons (Hamilton, 2004). The symbolic role and logic of consumerism pushes the demand for an enormous variety of material products (Jackson, 2009). In fact, the increasing prevalence of positional goods in modern economies may be one of the main reasons why economic growth cannot raise people's wellbeing as – by definition – positional goods are one person's gain and another's person loss (Hirsch, 1976).

Empirical evidence suggests that economic growth and over-consumption do not necessarily increase individual and overall wellbeing. Large scale studies in almost all developed countries indicate that large increases in economic growth and consumption since the early 1960s have not been associated with an increase in people's happiness (Layard, 2005). The more people are encouraged by capitalism and consumerism to follow materialistic goals, such as money, fame, competition or popularity, the lower their levels happiness and satisfaction and the more they report being depressed, anxious and unhappy (Kasser, 2002). Materialistic values not only undermine people's own wellbeing but also negatively affect the happiness, life satisfaction and health of others. This means that society as a whole can be damaged when those in power treat and promote others in their pursuit of wealth and status. Materialistic values have also been shown to be associated with a low interest in environmental and ecological issues (Kasser, 2002).

An Austrian study on compulsive buying published by the Vienna Chamber of Labour in 2006 (AK Wien, 2010) states that 6.1% of respondents are strongly at risk of compulsive buying, while 25.6% are significantly at risk.

Apart from fulfilling a need for prosperity and status, there is another fundamental motive for such addictions: people's subconscious fear of being left alone, having time to reflect in quiet solitude and doing some soul-searching. In psychology, this is referred to as the "shadow aspect" (Stein, 2006). When seeking happiness while trying in vain to ignore one's own more fundamental problems, a wide range of addictions can be employed as coping strategies: alcoholism, compulsive eating, gambling, collecting, cleaning and buying, as well as addictions to pleasure, information, television, communication, passive entertainment, etc. All of these represent futile attempts to find pleasure and to deflect one's attention as effectively as possible from what is in essence an unfulfilling life.

These reasons suggest that less materialistic lifestyles, which are not driven by growth, may bring substantial benefits to society in terms of happiness and wellbeing.

4.2 Growth has increased the speed of work and related levels of stress

One of the main drivers of growth is that work becomes more productive. An increase in labour productivity is often associated with an intensification of work. A combination of working more and working faster is symptomatic for many professions today. Many people nowadays cope with an enormous amount of job-related stress. It is well known that stress not only leads to physical health problems such as headaches, hypertension and heart attacks but also to psychological drawbacks and to a loss of life satisfaction in general. Feeling unable to keep up with the workload, many people are reaching burnout levels and suffer from depression.

Employment-related negative consequences on mental wellbeing also stem from the fact that types of work differing from the standard employment relationship have increased within the last decades, including temporary employment, part-time and low-paid employment. This has created a growing number of 'working poor'. It is questionable to what extent and under what conditions job employment growth under very flexible arrangements is desirable.

One has not only to take into consideration that economic growth speeds up our working lives but also that unemployment cannot be solved by economic growth alone.

4.3 Growth may foster technological progress, but also increases the chance of negative consequences

Economic growth has led to remarkable technological progress over recent decades, which allowed us to use natural resources and energy ever more efficiently. Yet, economic productivity increases have also led to rebound effects with negative environmental impacts (see section 3.4). One might pose the hypothesis that the need to spur technological progress and innovation in order to drive economic growth has led to situations where the negative effects of new technologies are not examined carefully enough.

Nanotechnology, for instance, is already integrated into a wide range of products, including cosmetics, sports equipment or food wrappings although there are large gaps in scientific understanding of the impacts of new nano-materials. Nuclear energy is another technology that raises concerns about health effects. Nuclear power plants can lead to catastrophic accidents such as Chernobyl in 1986 and Fukushima in 2010, causing suffering and environmental hazards for centuries. The disposal of nuclear waste is a problem and nuclear power plants may

also be a target of terrorist attacks. A comprehensive assessment of potential safety risks associated with nuclear energy easily casts its role as cheap energy supplier into doubt. Genetic engineering is another example of a relatively new technology with potentially big health, safety and environmental risks. Genetic engineering has undergone little safety testing and many products do not have to be labelled. So far, genetic engineering has not increased the yield potential of commercialised crops. Instead, it has led to an increased use in pesticides and has contaminated organic and conventional cultivations.

These examples show that new technologies might not only bring about the positive benefits hoped for but go hand in hand with worrying risks. Impact assessments can often not keep pace with technological developments.

4.4 Growth can contribute to environmental destruction

Our Earth can only tolerate a limited increase in the pressures on the environment before the global balance in the ecosystems start to 'tip' (Jaeger et al, 2007). Economic growth is the main driver of global environmental change in as much as it correlates directly with an increase in the exploitation of natural resources and produces additional waste and pollution in the process (UNEP, 2007). The effects of this global change do not refer to changes that take place naturally, but change that was brought on by human activity.

Over recent years, anthropogenic changes in nature have become ever more dramatic: climate change, desertification, the extinction of species, the compromised ability of natural systems to assimilate and regenerate, the depletion of non-renewable resources, but also poverty, hunger, increasing distributive injustice and mass migration are well-known consequences that are often interconnected and mutually reinforcing. The transformation of our environment accelerated dramatically in the second half of the 20th century and is now a substantial threat to the basis of our quality of life.

This can be shown to great effect in the currently most prominent example of global change: global warming. Human activity accounts for approximately 0.6°C of global warming in the past one hundred years, with the linear warming trend for the past 50 years nearly double that of the past 100 years (IPCC, 2007). Climate change also leads to reduced precipitation, the melting of glaciers, desertification and changes in the ocean streams. These phenomena lead to changes in land use (different crops must be cultivated; land is abandoned as it becomes barren, woods and forests change, etc.). These developments and the climate change itself cause changes in our ecosystems. In extreme cases, they collapse. Species often migrate elsewhere, die out or their ecosystems are invaded by non-indigenous species, who push out existing species and cause other negative effects.

Ecosystems provide us with food, wood and other materials; they help improve air quality and are a part of the food chain or have a high cultural value. This is why our wellbeing is to a large extent determined by a rich biodiversity (MA, 2005). If biodiversity continues to decline at the same rate or if the extinction of species steps up its pace even further, the future opportunities for positive development will be very limited both for the rich and the poor. However, the poor are affected much more directly than the rich. The UN employs a concept of vulnerability that reconciles aspects of sensitivity vis-à-vis environmental dangers with opportunities (e.g. of a region) to adapt to these dangers: poverty plays an essential role in this.

The use of natural resources has also increased dramatically in recent decades, mainly due to global population growth and economic growth. In 1980, nearly 40 billion tons biotic and abiotic resources were extracted from the global ecosystems; by 2010, worldwide consumption had increased to about 60 billion tons a year. This means that humans today extract and use around 50% more natural resources than 30 years ago. Increasing resource consumption and extraction does not only lead to environmental problems but has social implications too. It is often linked to human rights violations and poor working conditions in resource-exporting countries in Africa, Asia and Latin America. Given the current growth trajectory, worldwide resource extraction could increase to 100 tonnes in 2030 (SERI et al, 2009).

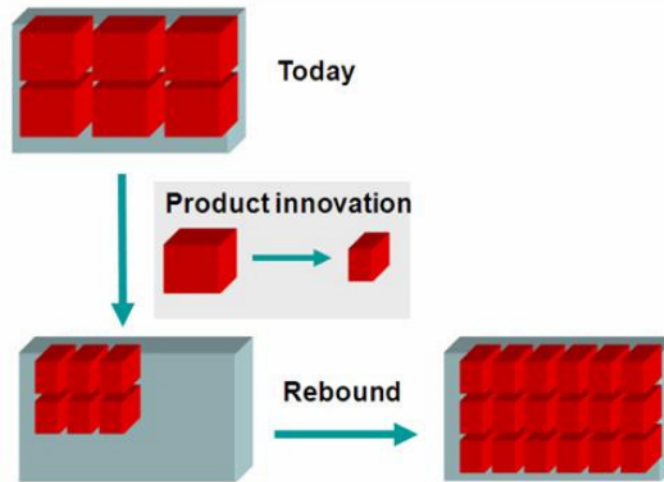
Despite massive technological developments and efficiency gains, this trend could not be stopped. Globally speaking, we now need roughly 30% less raw materials and energy than in the early 1980s to produce one unit of economic value added. However, these efficiency gains were more than offset by growing amounts of products and services that we consume, as a consequence of so called rebound effects.

The term rebound effect describes a situation where efficiency gains lead to a reduction in costs and consequently in price, which in turn leads to increased consumption. This means that many efficiency improvements do not reduce energy and resource consumption by the amount predicted. In the worst case, efficiency improvements are sufficiently large to lead to an overall increase in energy or resource consumption – an outcome called ‘backfire’. For instance, if a household decides to better insulate their house to save energy costs, the saved money could encourage them to increase the heating temperature in the house. This is called direct rebound effect. Or, they may spend the saved money on other energy-intensive goods such as additional flights. This is called indirect rebound effect.

Rebound-effects have been demonstrated in a number of empirical studies (Stocker et al, 2007 for Austria; Fischer et al, 2004 for Germany; Sorrell, 2007 for the UK). The rebound effect is shown in Figure 1. Though predominantly used in energy and resource economics, rebound effects can also be found elsewhere, often in the form of time rebounds. For instance, faster traffic connections might lead to higher commuting distances or faster communication techniques such as the internet might lead to spending more time writing emails instead of letters.

In environmental policy debates, rebound effects are closely linked to the debate of dematerialising our economy, i.e. the absolute reduction of energy and resource consumption. Many ecologists argue that technological progress is not likely to solve the problems of the overuse of natural resources, sinks and services. Although resource intensities are steadily declining with economic growth in industrial economies (relative decoupling), it is much harder to find empirical evidence for overall reductions in resource throughput (absolute decoupling). In general, most energy and resource efficiency policies have neglected the potential impact of rebound effects. Failure to take account of them in developing and targeting efficiency policies could contribute to shortfalls in the achievement of energy and climate goals (Sorrell, 2007).

Figure 1 The rebound effect



Source: Own illustration

4.5 Growth may lead to negative consequences of capital formation

As described in section 2.5 above, we distinguish between five kinds of capital – natural, social, human, financial and man-made capital. Throughout the last decades, economic growth has led to an expansion of man-made and financial capital, while at the same time natural capital decreases. The effects on social and human capital can be positive or negative. The argument here is that for the stability of the economic system some capital stocks cannot expand beyond a certain point at the expense of others.

Mainstream economics assumes a high substitutability between the five capital stocks. The depletion of stocks of resources and the existence of danger zones and thresholds in some environmental categories are largely ignored because it is assumed that there is high degree of substitution of natural resources with manufactured capital goods. This resource optimism is reflected in a paradigm of sustainable development, called weak sustainability. It is assumed that the welfare of future generations can be secured because there is full substitutability of natural capital and that the depletion of natural resources can be compensated via investments in other forms of capital. Some critics of growth reject the assumption that capital can substitute for resources because numerous functions that the environment performs cannot be duplicated by humans. This concept is called strong sustainability. The carbon cycle, for instance, cannot have a useful monetary value as it provides an ecosystem service that is impossible for humans to duplicate. Other examples of critical natural capital include biological diversity or the ozone layer. In the interpretation of strong sustainability, the size of the economy relative to the ecosystem is important (Pollitt et al, 2010).

4.6 Growth policies increase inequalities

As described in section 2.6 above, economic theory is ambiguous about the relationship between economic growth and inequality. The neo-liberal policies that have been pursued since the 1980s to spur growth are one core reason why issues related to inequality, distribution and social justice are gaining importance in recent years.

Global inequalities are clearly reflected in resource consumption. People in rich countries consume up to ten times more natural resources than those in the poorest countries (SERI et al, 2009). An average North American, for instance, consumes about 90kg resources per day; an average European approximately 43kg per person per day. In these continents people have larger houses, bigger cars and eat more meat – their lifestyles are highly resource intensive. In comparison, an average African citizen consumes only 10kg per day, an average Asian about 14kg. This means in Europe we consume three times as many resources as people living in Asia and four times more as the African population. Economic growth and related levels of consumption in the rich nations often come along with growing environmental and social problems in other world regions, often worst in poor countries in Africa, Latin America and Asia. Additionally, poor countries are often more affected by global environmental change such as climate change (in form of floods, storms, desertification etc.) (SERI et al, 2009). Another important dimension of inequality is income. Global income inequalities are increasing. More than 2.5 billion people live on less than 2 dollars a day (Ravallion and Chen, 2008). A comparative study including 100 countries from World Bank economist Branco Milanovic shows that the poorest 5% of the world population lost 25% of their real income in the last years, whereas the richest 5% gained another 12%. Globally, more than 2.7 billion people living in poverty share the same amount of wealth as the richest 50,000 people (Milanovic, 2005). Income inequality is also growing within rich nations. In the EU, 73 million people (16% of the entire EU population) experience poverty (EC, 2008). In the OECD, data provide evidence of a moderate but significant increase in income inequality over the past two decades across the OECD, although the intensity and causes vary between countries (OECD, 2008).

An often heard argument is that economic growth leads to a reduction of absolute poverty. This might be true and certainly makes a difference in poor countries. However, many studies show that what really matters to people above the poverty line is relative poverty, i.e. the level of inequalities in a country. For instance, Wilkinson and Pickett (2009) show the negative results of valuing growth above equality in rich countries. They found in more than 30 years of research that more unequal societies have negative effects for almost everyone within them, including the well-off as well as the poor. Almost all of the identified social issues and several environmental ones, (including community life, social relations, mental health, life expectancy, obesity, education, teenage births, violence, social mobility and consumerism) were found to be more likely to occur in a less equal society. Gradients show a strong correlation between income inequality and these social outcomes.

4.7 The focus on GDP growth as the main macroeconomic goal jeopardises development

The most commonly used economic indicator is Gross Domestic Product (GDP). Although it was not designed to be a measure of well-being, the interpretation of GDP shifted over the years from a basic measure of a country's market economy output towards a key indicator for measuring how well societies are doing in general, viz. from a means to achieve prosperity towards a goal in itself. This was at first partly justified as key factors for quality of life grew with GDP, such as housing, food, employment, health care, education and security. Today, there is strong consensus among academia, the civil society, business and the political sphere that economic output and its growth, as measured in GDP, do no longer necessarily mean an improvement in our quality of life for the majority of people. More than 40 years ago, Sen.

Robert F. Kennedy already highlighted: “GNP measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile” (speech given on March 18, 1968).

The key problem is that overemphasizing GDP-growth as a policy objective jeopardises our socio-economic and sustainable development, as it distracts from severe problems. GDP does not separate costs from benefits but rather knits them together as economic activity. For instance, expenditures needed to clean up an oil spill are added to GDP. Or shifts from the informal to the formal sector such as, for instance, paying a nanny for childcare instead of doing it oneself. As we move from an ‘empty world’ to a ‘full world’ these negative or quality-of-life-neutral GDP components increase. One might raise the question whether growth is not already increasing environmental and social costs faster than production benefits, thereby becoming uneconomic growth. In this case GDP would already make us poorer, not richer. Herman Daly (2010) states: “At a minimum, we must not just assume that GDP growth is “economic growth,” but we must prove it. And we can start by trying to refute the mountain of contrary evidence”.

We conclude that the fixation on GDP as the central goal of our economies can be misleading.

But it is not only the question whether we want growth or not. Economic growth is the outcome of complex economic processes that are mostly quite independent of what economists or politicians want. We therefore deal with these forces in the next section.

5 Seven engines of growth

What are the major forces behind growth? Samuelson and Nordhaus (2001) write in this context that many roads lead to Rome. This means, economic theories suggest a range of factors that drive economic growth, typically including the amount of resources (natural resources, labour and capital) as well as the efficiency of their use (which is largely determined by technological innovation, improved labour skills/human and social capital and an improved organisation).

The main factors underlying the quantity and growth of real GDP depend on the volume of supply and demand. Aggregate supply represents the productive capacity available in the economy to produce goods and services. It relates total national output to the inputs and technology. In the short run, producers respond to higher demand (thus prices) by using more inputs in the production process and increasing the utilization of their existing inputs. In the long run, the productive capacity of an economy is based on the state of production technology and the availability and quality of factor inputs.

Aggregate demand is the total amount of final goods and services produced in the economy that people, businesses, governments and overseas agents buy.

While in the short run fluctuations in demand determine the level of GDP, over the long run, it is the ability to supply output that supports the growth of GDP. Investment provides an important link to long-term economic growth. Unlike other expenditures (e.g. on private consumption) investments augment the capital stock, induce new capital inputs for future use and offer opportunities for economic growth.

All of these demand and supply factors are crucial drivers of economic growth and are explained in the sections below: consumption, labour, technological progress, energy and natural resources, capital formation, global trade and finance and – as a framework condition – the institutional framework. Only if supply and demand grow the economy will grow.

5.1 Consumption

Consumption represents the largest single component of GDP and encompasses the expenditures by households on final goods and services. It is crucial for economic growth as it directly affects output and employment. Moreover, the part of people's income that is not consumed, i.e. savings, is available for investment in capital, another driving force behind long-term economic growth (section 4.5).

Our economy is dependent on consumption. Without sufficient consumption, the economy can enter a downward spiral of less production – less employment – less income – less consumption and so on, if the lack of consumption is not over-compensated by other growth drivers such as government spending or exports. In the worst case, this may lead to economic recession and depression. In order to prevent this situation, it is generally assumed vital for the current economic system to keep expanding consumer demand, for instance by advertising, creating novelty and planned obsolescence, i.e. policies of deliberately planning and designing short life products for quick and repeated purchases. The materialistic goals embodied in capitalism and consumerism, have without doubt led to the long lasting period of growth of the world economy over the last decades. The striving for growth and for achieving a high standard of living has been at the centre of considerations since World War II.

5.2 Labour

Labour is a second main driver of economic growth. If more people in a society work or if people work longer hours or more efficiently, more goods and services will be produced and total output grows. In other words, GDP increases either, if the number of workers and employees and their total amount of working hours increase (quantitative aspect) or if the workforce gains better skills and the productivity per working hour therefore increases (qualitative aspect).

Many economists believe that the qualitative aspect of labour – the skills, knowledge and discipline of the labour force – is the single most important element in economic growth (Samuelson and Nordhaus, 2001). Therefore, increasing the productivity of labour is a constant concern related to economic growth. Improvements in labour productivity can be achieved, for instance, by technologies that reduce the amount of labour needed, by motivational and behavioural measures, including individual reward and payment systems or by the flexibility of labour markets.

However, increasing labour input has certain limitations. It depends on the labour supply, which is influenced by demographic changes, such as the ageing of populations or immigration and the availability of a workforce with the right qualifications and knowledge. Higher labour productivity may also increase work intensity as well as related stress-levels and negative health effects (see section 3.2).

5.3 Technological progress and innovation

Technological advance is a continuous process of small and large improvements and a vital ingredient in the growth dynamic. Technological progress drives growth by increasing productivity. This means the economy can produce more output with the same level of inputs. Improvements in productivity can be related to labour (see 4.2), capital (see 4.5) or energy and materials (see 4.4). Innovation of the past that has greatly increased productivity were the steam engine, the generation of electricity, antibiotics or the telephone and, at a later stage, mainly information and communication technologies. Technological advancement was crucial for our development – if we still relied on the muscle power of humans and animals for production, our economic growth rates would be much lower. Samuelson and Nordhaus (2001) state: “Growth has definitely not been a process of simple replication, adding rows of steel mills or power plants next to each other. Rather, a never-ending stream of inventions and technological advances led to a vast improvement in the production possibilities of Europe, North America, and Japan”. Economists today perceive the fostering of entrepreneurial spirit as the most important driver of rapid innovation and technological progress.

5.4 Availability of energy and natural resources

The extraordinary economic growth rates we have witnessed since the industrial revolution have been fuelled by the cheap availability of fossil fuels, which also enabled cheap resource extraction and processing. Besides oil and gas, other important natural resources for economic activities are arable land, forests, water and mineral resources. In the past, some high-income countries like Canada and Norway have primarily grown on the basis of their ample resource base, with large output in agriculture, fisheries and forestry. Also resource-poor countries such as Japan have achieved economic success by concentrating production more on labour-intensive and capital-intensive sectors. However, all our economies ultimately depend on energy and natural resources for their survival in the long run. It is also crucial to bear in mind that energy and natural resources are available free of charge for economic activities. Natural resources per se have no price. Their price is determined by the costs for extraction, processing and transportation as well as by governmental decisions such as property rights, taxation and subsidies.

5.5 Capital formation

Capital used for the production of goods and services includes factories and machines, buildings, computers and alike. More output requires a higher capital stock. The accumulation of this capital requires investments. Investment means sacrificing consumption today in order to increasing consumption in the future through a flow of capital services. The formation of capital not only includes private investments but also huge investments made by governments that lay the foundations for a thriving private sector. Government spending includes large-scale investments in transportation infrastructures (roads, bridges, railways), energy networks (electricity grids, water pipes) or communication systems (telephone networks).

As discussed above, a more comprehensive capital approach includes natural, human and social capital as productive factors of an economy. Natural capital comprises all natural resources that provide us with energy, raw materials, absorption capacity for waste, as well as cleaning capacity. Human capital includes the physical abilities of humans, their intelligence and knowledge but also other human dimensions that contribute to wellbeing and performance, such

as health, education and happiness. Social capital consists of networks among individuals and groups, which can be formal or informal. Established institutions that constitute social capital include organisations, standards, education and information systems. There has been criticism that nature, relationships and humans are described as capital. What is interesting in this concept, however, is that it is regarded as a prerequisite for economic production that can receive investment and that translates into economic damage if lost.

Another important feature that relates to capital formation is money. Both companies and governments need money for their investments. The money they take out in the form of loans is interest-based, meaning that their profits not only have to cover their costs and their own profits, but also the amount that the lender wants to earn. This ultimately not only leads to the accumulation of physical capital but also of financial capital. As soon as there are no new investments on the basis of a growing money supply, profits cease to grow and cause the profit rate to fall below a level that investors consider worth the investment risk, as their risk is no longer fully covered. This results in a growth imperative (Binswanger, 2005).

5.6 Global trade and finance

Nations and companies benefit from international trade mainly from decreasing costs of large-scale production. So when a country gets a head start in producing a certain product, it can become a high-volume, low-cost producer. These economies of scale lead to significant cost and technological advantages compared to other countries. Especially in industries with large research and development (R&D) expenses large scale production is often a competitive advantage.

Economic theory suggests that an open global trading system is beneficial for all parties involved as it promotes competitiveness and adopts best-practice technologies. By opening borders and keeping trade barriers low, it is ensured that domestic companies are spurred by competition and that foreign firms can enter domestic markets. Globalisation has not only led to more trade in goods and services but also to the expansion of the banking and finance sector. Given the global availability of communication technologies, global finance has exploded since the 1980s. This development reshaped the money system and led to a growth in international deposits, loans, branches, portfolios and electronic trading.

However, Herman Daly (2010) adds that economic assumptions about the gains of free trade like Ricardo's comparative cost advantage theory act on a hypothesis of immobile production factors, which is no longer correct in times of international capital mobility (and increasing labour mobility).

5.7 Institutional Framework

One of the most important and subtle drivers of economic growth concerns institutions. Since the industrial revolution, the idea of progress has been strongly associated with economic growth. The dominant way of thinking follows the logic that satisfaction in life is not to be attained by the pursuit of meaning in life and inner evolution, but by finding immediate happiness through increasing one's social status and associated forms of consumption. In emphasising these material pursuits and in following extrinsic motivations, we have created an institutional environment which is geared towards economic growth measured in terms of GDP, which is still commonly used as a measure of wellbeing and an indication of progress. Thus,

any activity contributes to our national wellbeing “by virtue of the fact that, and solely to the extent that, it is produced for sale” (Hamilton, 2004, p54).

Many of today’s institutions are designed and function in a logic that fosters economic growth. Politics, for instance, rely on the current economic system for the creation of revenues to finance public goods and services. Business models and financial institutions are headed towards increasing profits that go hand in hand with an increased output at the macroeconomic scale. These and other actors in the economy have vested interests to defend the growth paradigm. As such, they are essential drivers of the growth dynamic.

In the next section we describe the main reasons why growth may not continue forever. These reasons are mostly related to weaknesses in the aforementioned drivers of growth.

6 Seven reasons why growth may not continue forever

Economic growth has certain limits that are already inherent to the system. Empirical studies show that the absolute increases of per capita GDP in the Western industrial countries have been declining. Not exponential, but linear growth is the normal case in developed economies (e.g. Bourcarde and Herzmann, 2006; Miegel, 2009). Empirical evidence for the OECD shows continuously declining growth rates since 1950 in 15 countries: Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Portugal, Sweden, Spain, Switzerland, Japan and Canada. The remaining five industrial nations (Australia, UK, Ireland, Norway and the United States) are exceptional cases, in which growth rates decrease at a much slower rate. Bourcarde and Herzmann (2006) explain these exceptions for instance by the strong population growth in Australia between 1950 and 2001 (+ 134%) or, in the case of Norway, by oil in place as an advantageous special condition. However, even in these cases economies have not grown exponentially.

Figure 2 illustrates the decline of growth rates in most early industrialised countries for the EU15, Japan and the United States between 1950 and 2010.

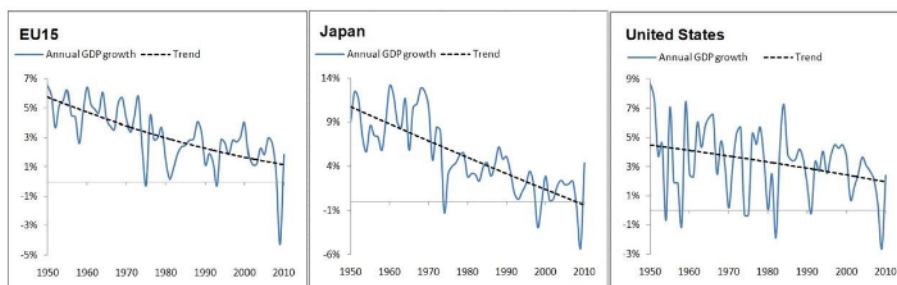


Figure 2 Real GDP growth in EU15, Japan, United States.

Source: Data 1950-2008: Maddison, 2010; Data 2009-2010: World Bank 2010

One has to notice that these empirical findings only apply for developed economies. The trend of the Chinese GDP, for instance, shows exponential growth. The comparison with more industrialised economies, however, is limping as the current level of Chinese GDP is comparable to the one of Germany in the year 1900 (Bourcarde and Herzmann, 2006). The main

conclusion is that exponential growth can occur during an economy's early stage of development, but that the growth path is likely to pass into a linear trend as soon as the development phase has finished.

In this section we present a series of arguments why unlimited growth might not be possible in the long term. Generally speaking, economic growth is mainly driven by increases in supply and demand factors (see section 4). If these factors cease to grow, economic growth will decline.

6.1 Consumer restraint

As described in section 4.1, private consumption is considered a fundamental pillar of aggregate demand. If consumption decreased this has a negative impact on GDP growth, at least in the short run. Although it is the ability to supply output that supports real GDP growth in the long run, fluctuations in demand determine the level of GDP in the short run. Consumer restraint could either be the result of people's (voluntary) willingness to consume less or because of (involuntary) restricted consumption possibilities.

Concerning the willingness to consume, Hirsch already in 1977 described in 'The Social Limits to Growth' that high consumption could decline after having reached a certain point (Hirsch, 1977). Though at a low level, it can be observed that growing population groups consciously live in a more sufficient way. This could for instance occur if people withdraw from active economic life to deliberately limit their personal consumption in favour of more leisure time (e.g. Miegel, 2006; Dahm and Scherhorn, 2008). A lot of people would deliberately opt for working part-time and forgo income and hence consumption if it were firstly secured and secondly associated with less gainful employment. If a big number of people opt for voluntary simplicity, private consumption as most important sustainers of aggregate demand declines.

Concerning the possibilities to consume it can be observed that consumption growth in Austria and Germany has been below the long-term average in recent years. The main reasons for reduced consumption spending are a higher savings rate and zero net real income growth as a result of rising prices, especially for food and energy. Besides high inflation, high taxes might be a cause for fewer possibilities to consume. At the first glance, a higher saving rate accompanied by stagnating real income appears paradoxical, because households do not have more money at their disposal for savings. The current trend towards a higher savings rate should therefore be traced back to other causes: First, saving money out of fear: the uncertainty about one's future income situation in combination with rising prices and the fear of rising unemployment figures and the loss of one's own job provides an incentive to set aside capital reserves to buffer any negative future contingencies. Increasing investment in private retirement pension schemes also betray increasing uncertainty about the future reliability of the state retirement pension system (Klär and Slacalek, 2006). Citizens therefore find themselves in the schizophrenic position of being told by state representatives to save up for their retirement and to boost consumption in order to stimulate the economy. Second, income distribution is shifting in favour of households with higher incomes, which naturally are in a better position to save more money. The incomes of higher income earners are growing at a faster rate than those of low income earners. Third, most savings are created during a person's active years of gainful employment (Klär and Slacalek, 2006). The "baby boomers" are today at the peak of their working life and are therefore providing the bulk of the savings.

A higher savings ratio at the cost of consumer spending does not necessarily constitute a hindrance to healthy growth, since it provides credit for investments that are just as important for growth as consumption. Linz (2006) believes that economic activity based on the idea of eco-sufficiency – with reduced production and consumption – also opens up opportunities for creating new business fields, such as in the environmental engineering sector, in maintenance and servicing, regionalisation and in the transformation of currently unpaid services into gainful work with a corresponding market value.

6.2 Demographic change and a shrinking labour force

Growth is driven by the size and the productivity of the workforce (see section 4.2). If the workforce decreases (e.g. because people are in training, retired, on sick leave or on a sabbatical), GDP will fall. A higher GDP level per person in employment would be required to keep per capita income steady. In industrialised countries this is already the case: the working-age population will decline because of demographic ageing (Münz and Reiterer, 2007) – even though working-age will for this reason be lifted considerably. As far as this will not be compensated by technical productivity progress and immigration, the possibility for a whole economy to produce more – and therefore to grow – will also decline.

A main reason for a shrinking workforce is because most Western societies grow older. The demographic trend towards an ageing population, evident in almost all rich countries and regions of the world, is an expression of increased quality of life – which to some extent depends on economic growth, since a certain income is required to satisfy one's basic needs. This trend is essentially based on lower birth rates and a simultaneous increase in life expectancy.

For highly developed economies we also observe a stabilization of population or even decline, which will further intensify in the future. If population growth comes to an end, this driver of economic growth is no longer effective. If the population shrinks in any given country/continent, fewer goods and services are produced and consumed, although productivity remains the same. Total GDP decreases, but per capita GDP might remain unchanged.

6.3 Decreasing productivity and international competitiveness

Most economists and politicians agree that increased productivity is crucial for higher living standards. But productivity growth might have certain limits. An increase in labour productivity might be restricted as it leads to an intensification of work with related stress-levels and negative health effects (see section 3.2). Also, one could question the desirability of increased labour productivity after a certain point. If the number of a doctor's patients or the number of students per university professor is taken as improving productivity, the quality of the services would probably become unacceptable. Furthermore, the negative side-effect of ever higher labour productivity is a decrease in employment, as fewer labour input is needed to produce a certain product or service. Concerning resource productivity, there is still ample space for improvement; however, this cannot increase indefinitely. The same applies for higher capital productivity. Overall, productivity gains are relatively easy to achieve at early stages of economic development but become increasingly difficult and costly over time. In the Western world productivity has fallen in recent years, partly because from the shift from a manufacturing to a service economy.

Declining growth rates in developed economies could also be the result of the industrialisation of emergent nations or regions like China, India and Latin America. The head start in innovations of the currently technologically superior industrial nations increasingly melts down because of ‘climbers’, who invest immensely in education and modern infrastructure. Following Paech (2009) this applies particularly to the area of technology and knowledge based export products. Through rising prices of resources on the world market and hence rising production costs for Western producers, the transition economies will within a short period be able to challenge comparative cost advantages of the rich industrial nations (Anderson, 2007; Paech, 2009). Although the emerging economies are also potentially new markets for Western export products, it is not obvious that developed economies will be able to sustain their international competitiveness on the world market.

6.4 Environmental limits to growth: sources, sinks and services

The main sources of any economic activity are materials, land and energy. As a result of the cheap availability of resources in the past, global extraction of abiotic (fossil fuels, minerals) and biotic (agriculture, forestry, fishing) resources increased from 40 to 60 billion tonnes per year between 1980 and 2010. By 2020, total used extraction may reach about 80 billion tonnes in order to sustain worldwide economic growth (Giljum et al, 2008).

Whether or not the enormous rates of resource depletion and the earth’s limited amount of resources will set a natural limit to economic growth, is still strongly debated. On the one hand, there are advocates of technological solutions who argue that there are many cheap substitutes for scarce resources. On the other hand, it is becoming evident that the increasing pressure on the availability of natural resources is causing a strain on both the environment (Heinberg, 2007) and the economy. Peak oil, for example, may lead to a dramatic drop in oil supply, increasing resource prices and a rapid rise in unemployment.

Even if there are still plenty of resources to be used for economic activities, there are limits to capacity of nature’s sinks (air, soil and water) to degrade our wastes. The extent of our economic activities often exceeds this capacity regionally, nationally and globally (Rockström et al, 2009). The ability of these sinks to perform environmental services is further jeopardised by climate change.

Meadows et al (1972; 2006) showed that more economic capital will be necessary in the future to provide people and the economy with natural capital, which will ultimately lead to a slowdown in economic growth itself. Thus the ruthless exploitation of natural capital will make it increasingly expensive to use natural capital. The increasing use of renewable resources, the depletion of non-renewable resources and the overtaxing of the pollutant sinks of the earth together make it necessary to use more and more energy and capital in order to provide the volumes and quality of material flows required by the economy. Once these costs become too high, further industrial growth no longer is sustained. That is when the positive feedback effect that has led to an expansion of the material economy will invert itself and turn into a process of economic shrinkage (Meadows et al, 2006). Therefore, the consequences of economic growth will slow it down before we reach the limits of our earth.

6.5 The instability of financial markets and increasing debts

Regarding capital accumulation, two reasons are described that might cast high future growth rates into doubt: the instability of financial markets and increasing levels of debt.

The financial sector and capital in general have grown much faster in recent years than the ‘real’ economy. One reason was that the growth imperative has increasingly shifted from companies to private households, which have been taking out more and more loans to finance their consumer spending. The current financial market crisis can be essentially traced back to the fact that banks lent households amounts that were not properly collateralised with their properties, because the properties themselves were overvalued. This created artificial demand that exceeded the households’ financing capabilities. This type of consumer spending was only made possible because these loans were granted. In other words, economic growth was fabricated and was therefore too high and economically unsustainable.

This has repeatedly led to the formation of bubbles. When bubbles burst, they cause a considerable moderation of the growth dynamic. The financial crisis was initially characterized by a credit crunch; that means banks stopped lending among themselves with considerable effects on both interest rates and the amount of money available for private sector loans. Lacking money for investments and high interest rates hampered economic growth. As a consequence of the crisis, governments consider introducing measures to regulate financial markets more stringent. Stricter regulation of financial markets such as higher capital requirements that are, for instance, discussed under Basel III will lead to a decrease in monetary expansion, higher interest rates and consequently reduced GDP rates.

Another question in this context is, if growth slumps not only occur from exaggerated financial market expectations, but also (or rather) from real economic limits. Andreas Breitenfellner (2009), an economist from the Oesterreichische Nationalbank, points out: “The current financial crisis can be seen as the failure of the attempt to fight against declining growth rates”. Pushing the economy beyond its growth potential is bound to fail. We painfully realise today that the growth of last years was probably not economically sustainable – ecological and social aspects left aside.

Massive government debts might be another reason for low growth in coming years. A big challenge for future economic output of most economies stems from the fact that debt levels have consistently grown at a faster pace than GDP. Based on data from the Economist and the Institute of Integrated Economic Research (IIER), Richard Douthwaite (2010) illustrates that world debt has grown 250% in the past decade, from US\$ 18 trillion in 2001 to US\$ 45 trillion in 2011. Emerging economies were able to decrease their debt/GDP share from 49% to 45% but advanced economies have increased their debt/GDP share from 72% to 150% in recent years. Some countries’ debt has already become unsupportable; some countries have reached levels close to their theoretically sustainable maximums. IIER (2010) describes the consequences as twofold: growing defaults of debt once it reaches unsustainable levels and the inability to grow debt further, which in turn limits economic growth.

6.6 Rising inequalities

Some studies show that inequality reduces economic growth, especially in democracies (Persson and Tabellini, 1994). Glaeser et al (2003) suggest that inequality jeopardises the security of property rights and is therefore detrimental to growth, as it helps the rich to benefit

by subverting the political, regulatory and legal institutions of society. “If one person is sufficiently richer than another, and courts are corruptible, then the legal system will favour the rich, not the just. Likewise, if political and regulatory institutions can be moved by wealth or influence, they will favour the established, not the efficient” (Glaeser et al, 2003). The rich are thus incited to pursue socially harmful acts, knowing that they will not be held accountable by the legal, political and regulatory systems. Rising inequalities in terms of per capita income may also lead to a decrease in overall purchasing power, resulting in lower growth.

6.7 The belief in growth diminishes

Many people are increasingly sceptical about the benefits of continued economic growth. A poll commissioned by the Bertelsmann Stiftung in 2010 concluded that overall, people believe economic growth is important for quality of life of a society but 61% of one thousand interviewed Germans and 54% of one thousand interviewed Austrians do not believe that economic growth still contributes to increasing their own quality of life. The poll also showed that people do not support economic growth at all cost. Three quarters of the respondents said that an increase in material wealth is less important to them than protecting the environment for future generations and reducing public debts. Meinhard Miegel (2010) similarly concludes that people often state that one needs economic growth but the individual person actually not.

Increasing awareness about the side-effects of economic growth is also reflected in the rising popularity of growth-sceptical initiatives such as the *decroissance* (de-growth) movement. Originating in the 1970s by intellectuals such as Nicholas Georgescu-Roegen, de-growth is a political and social movement based on environmentalist, anti-consumerist and social justice ideas. De-growth activists advocate a downshift in production and consumption. An alternative social model based on ecological sustainability and social equity is proposed by changes in sufficient individual lifestyles and structural changes in the economy. The movement is mostly known in France, Italy and Spain but is gaining importance in other European countries in recent years.

So what can we learn from all these arguments? In the following section, we try to draw some conclusions.

7 What are the pillars of a growth in quality of life?

The arguments in the preceding sections have shown that, overall, economic growth in its current form does not enhance quality of life. In a climate of perpetual stress, pressure to perform and be competitive, fear of losing one’s job, lack of fairness in distribution and rampant consumerism, we are losing natural, human and social resources and thus decrease the general level of prosperity. Moreover, we saw that the drivers of economic growth have become weaker over time. Sustainable alternatives to the so far quite successful economic growth model should therefore be discussed that enhance quality of life and wellbeing within the planetary boundaries. The following sections aim to encourage debate on what sustainable alternatives could look like.

7.1 Changed patterns of consumption

A vast amount of literature has challenged the widespread belief that higher incomes and related higher levels of consumption make people happier and satisfied with their lives (section 3.1). Prosperity is not the same as material wealth. “Rather, prosperity has to do with our ability to flourish: physically, psychologically and socially. Beyond sheer subsistence or survival, prosperity hangs on our ability to participate meaningfully in the life of society” (Jackson, 2009).

Sustainable consumption means to satisfy people’s needs and thus increase their quality of life while staying within ecological boundaries. In order to manage proceeding environmental destruction, future consumption has to be both more resource-efficient and more resource-sufficient. Less consumption does not necessarily reduce the quality of life. Ultimately, it depends on how we satisfy our needs for food, housing, clothing, mobility and recreational activities. These needs can be satisfied in an environmentally friendly way without having to compromise high quality of life. For this new consumption path, the right incentives, long-term oriented policies and good communication are key.

Required policy measures must both support a change in social behaviours and address the structural incentives towards materialistic consumption and unproductive status competition. This requires communication and education about happiness, values, the ecology and debt as well as stronger regulation in relation to the commercial media and stronger consumer protection on questions of product durability and safety, sustainability and fair trade. Equally important are increased investments in public goods and social infrastructure. Social innovation is vital in changing consumption with considerably less material input. The tax system could favour goods that are more durable, more useful and less harmful to the environment and people’s health (Victor, 2008; Jackson, 2009). As people’s happiness critically depends on their relative income, higher progressive taxes on income could be introduced. Policies that support changes in the social structure can and do shift people’s values and behaviours. This is absolutely essential as policy changes must not only be driven top-down but wanted and accepted by the public. Citizens can and have to take action to affect change. Households and communities are vital for pointing to the possibilities for flourishing within ecological limits (Jackson, 2009).

7.2 New forms of work

A growth in quality of life aims to create flexible, high-quality employment arrangements for all who are willing and able to work. One possibility for reducing unemployment and creating healthier work-life-balances is to distribute the amount of work more equally via less working hours (Sanne, 2007; Hinterberger et al, 2009). In order to achieve an overall work-time reduction that results in positive employment effects, three factors are essential: a reduction of the norm, an increased flexibility for employees to choose their working time and accompanying political measures, which induce a cutback of barriers. As an example for a new ‘norm’, the new economics foundation (nef, 2010) proposes a 21-hour week and suggests nearly 30 concrete policy measures, grouped in four categories: achieving shorter working hours; ensuring a fair living income; improving gender relations and the quality of family life and changing norms and expectations. Work time reductions could also be reduced step by step as productivity increases. In order to increase work-time flexibility, employees’ possibilities concerning weekly work-time, family time, parental leave, sabbatical breaks and amount of

leave days would have to be improved (Jackson, 2009). Several policy measures should accompany the process: ending the discrimination of part-time jobs, e.g. concerning job security and rate of pay, changing from costs per employee to costs per hour, an active training policy to avoid shortages of skilled labour and redistribution measures, because those, low wage employees simply cannot afford to work less.

Another possibility for creating jobs and reducing work-related stress is to slow down the level of productivity gains. This is more difficult to influence politically, but still can be pushed by the support of a shift from production to maintenance and repair, which are more labour intensive and a strengthening of other labour intensive sectors, such as education and care, through measures such as a reduction of the number of students per class or of care patients per caregiver.

7.3 Changed investment patterns

If we look at the range of current challenges it can be assessed that, at a basic level, many of them share a common characteristic: the misallocation of capital. In the last two decades, much capital has been invested into property, fossil fuels and structured financial assets with embedded derivatives, but comparably little has been placed in energy efficiency, renewable energy, public transport or sustainable agriculture (UNEP, 2009). A failure to change this investment track could lead to social problems of job losses, socio-economic insecurity and poverty. There is a general consensus that massive investments are needed over the next decades to achieve sustainable development.

The direction of investment and innovation is important. Investment in jobs, assets and infrastructures emerges as a key component (Jackson, 2009). Targets for this include: public sector jobs in building and maintaining public assets; investments in renewable energy, public transport infrastructure and public spaces; retrofitting the existing building stock with energy- and carbon-saving measures; investing in ecosystem maintenance and protection and providing fiscal support and training for green businesses, clean technologies and resource efficiency. Also, we will have to tailor the tax system so that investments in beneficial and less harmful technologies are preferred (Victor, 2008). In addition, different patterns of investment are required that reflect the changing living situation of people (e.g. more public goods and fewer private, status goods) and different public policies. For instance, adopting a cap auction trade scheme for resources, as described in section 6.4 below, will have an impact on investment through price effects. While investments in assets that use large amounts of resources will become unattractive, investments in assets that preserve throughput will become more attractive (Victor, 2008). Above all, investments in research and education are key for a transition towards a sustainable economy. For instance, there is an urgent need for a comprehensive macroeconomic theory and models that deliver economic stability without growth in consumption and production that remains within the ecological capacity of our planet.

7.4 Limits to resource use

A truly sustainable economy maintains a throughput that is within the assimilative and regenerative capacities of the ecosystem. Technological innovation and the associated improvement in resource and energy efficiency have not yet brought the solution to ecological overshoot. There is no proof that we cannot achieve absolute decoupling, but we argue – in line

with the precautionary principle – not only to rely on the ‘technology will save us’-strategy but to strengthen farther reaching policies such as limits, taxes and trading schemes.

Cap Auction Trade Systems for Resources are an example of combining limits, taxes and trade. Cap refers to limiting biophysical scale by quotas on depletion or pollution (depending on which one is more limiting), auction of the caps allows for rents for just redistribution; trade enables efficient allocation. The basic idea is that a regulatory agency (e.g. a government) sets a limit, based on the rate of depletion of the respective resource or resulting pollution that the economy can be allowed to impose on the ecosystem. Ideally, the quota should be applied at the input end as it is easier to monitor, more spatially concentrated and the higher price will lead to a more economical use at each following stage of production. The government initially owns the quota and auctions them to enterprises, municipalities, individuals etc. whereby the revenues should ideally be used to reduce income tax. The market determines the price as the quotas can be freely bought and sold by third parties. The same logic can be applied to fish catch allowances, water use allowances, forests etc. For renewable sources, the quota should be set to an estimated sustainable yield. For non-renewables, the rate of advancement of renewable substitutes or sustainable rates of absorption of resulting pollution can act as a criterion (Daly, 2010). The scheme can be applied regionally, nationally, and internationally and has the advantage of transparency (Daly, 2010).

Environmental Taxes and Ecological Tax Reform represent alternative approaches where governments impose a price or tax on resource use or undesirable emissions and let the variety of actors determine the level of resource extraction and emissions. If extraction rates or emissions turn out to be too high, the price can be adjusted accordingly. Ecological Tax Reform internalises external costs by shifting the tax base from things we want (labour and capital) to things we do not want (depletion and pollution) (Ekins and Speck, 2011). Proponents usually request revenue neutrality, i.e. government revenues remain unaffected. In a modified form some revenues can be used for other purposes such as the support of new technologies. A risk under this option is that the amount of tax revenues could be quite different from the required amount of revenue for the support activity. If revenue becomes a main target, the tax may be set at a low rate for fear of eroding the tax base. Hence, revenue neutrality is an attractive feature in order to meet the environmental policy objective the tax was designed for. Governments are therefore well advised to determine their revenues and expenditures separately (Victor, 2008).

7.5 A balance in different forms of capital

We described in section 3.5 that under the current economic regime, man-made and financial capital have increased at the expense of natural capital and partly also at social and human capital. Therefore, promoting human and social development (e.g. through better education, more investments in public spaces etc.) and natural capital (see section 6.4; e.g. protecting biodiversity that also leads to positive effects on human capital) are targeted. This section focuses on two issues related to man-made and financial capital: the monetary system and international trade.

In order to protect our social and natural capital, it may be necessary to rethink the unrestricted free trade agenda of the last decades and ensure that prices reflect the true environmental and social costs of production. A global carbon price, for example, would make transport more expensive and thus help to reduce the overall trade volume to a more sustainable level.

Similarly, the general application of “fair trade” standards to international trade would reduce social costs, make traded goods more expensive and hence lead to a further reduction in trade volumes (Bayon 2010). If the implementation of these measures is not feasible internationally, countries could introduce comparable measures of cost internalisation on their own.

Reforming price policies and re-regulating international commerce could lead to a “new protectionism” (Daly, 2010). This protectionism would not protect inefficient industries, but sectors that are affected by national policies of cost internalisation. In cases where environmental and social costs are included in the price of products, free trade with countries that do not have such policies might not lead to welfare gains but to standards-lowering competition. New tariffs which would be introduced in order to constrain this “race to the bottom” would at the same time be a good source of public revenue (Daly, 2010). As the measures described are conflictive with current trade agreements and the focus of the relevant international organisations (WTO, IMF and World Bank), a renegotiation of trade agreements (Victor, 2009) as well as a reform of the international institutions (Daly, 2010) would be required. The described trade policies would very likely lead to a reduction of the trade volume. It would therefore foster regional economic cycle and contribute to localisation. There are several questions concerning trade policies that should be additionally considered, including which biophysical indicators might be good for trade, what kind of governance systems will be needed and how questions of national food security can be included (Giljum and Polzin, 2010).

The second reform for rebalancing the different forms of capital addresses financial capital and would entail an overhaul of the monetary system. The basic idea of today’s fractional reserve banking is that banks create money by extending loans. In other words, almost all the money used in the economy exists because someone has borrowed it and is paying interest on it. As the creation of money requires loans from the banking system, some people or companies are required to go into debt. The level of debt will steadily increase if the lending institutions are profitable. Critics find it problematic that banks ‘create money out of nothing’. The question arises how a more resilient money system can be built. For now, a major focus in the theory and practice of alternative money and financial systems is on creating alternative currencies, both as a means to stimulate local economic activity and as a supplement in the event of the failure of the global monetary system (Scott Cato, 2009). Daly (2010) suggests moving away from Fractional Reserve Banking toward a system of 100% reserve requirements. 100% reserve requirements would imply that every Euro loaned to a borrower was a Euro before saved by a depositor. Banks would receive revenues by financial intermediation only and the government could pay its expenses by issuing non-interest-bearing fiat money (to substitute the eliminated interest-bearing money created by banks). Issuing new money would however only be possible up to a strict limit imposed by inflation. As soon as the price index begins to rise, the government must print less and tax more. Daly (2010) proposes a policy of maintaining a constant price index to govern the internal value of the currency and freely fluctuating exchange rates to govern its external value.

7.6 More equality, less poverty

Poverty and inequality are much more than a lack of income although lacking income is definitely a key facet of both hardships. Above all, poverty and inequality reflect deficiencies in policies to distribute resources and opportunities in a fair and just way. In order to establish a sense of community based on democracy it is essential to tackle inequality and poverty.

For Herman Daly, the limits to the extent of inequality could be influenced by a minimum and a maximum income: “The civil service, the military, and the university manage with a range of inequality that stays within a factor of 15 or 20. Corporate America has a range of 500 or more. Many industrial nations are below 25. Could we not limit the range to, say, 100, and see how it works?” (Daly, 2010). He suggests that people who reach the limit could either work for free at the margin or spend their extra time on public service or hobbies.

French economist Thomas Piketty argues for a highly progressive income tax to avoid future financial crises. By analysing the historical development of income inequalities and wealth in industrialised economies, Thomas Piketty found out that big financial crises can partly be explained by widening income gaps. A fast growing financial sector results in income gaps because rich people benefit most from capital gains. In order to avoid future financial bubbles Piketty suggests a highly progressive income tax instead of conventional policies, such as the kinds of tax cut policies that have been advocated since the late 1970s. The 0.5% of the population with extremely high salaries (e.g. above € 1 million per year) could be subject to income taxes of as much as 80%. Piketty draws inspiration from policies enacted by Franklin D. Roosevelt during the economic crisis in the 1930s. Roosevelt enforced a 91% income tax for annual incomes higher than US\$ 200,000 (equivalent to US\$ 2 million today). Until 1980 this tax was on average 80.2% – without suspending the American capitalism.

7.7 Measuring what matters

It is widely accepted that GDP as the single most important indicator of economic performance cannot simultaneously and comprehensively reflect social progress. “There is a clear case for complementing GDP with statistics covering the other economic, social and environmental issues on which people’s well-being critically depends” (EC, 2009). Initiatives such as the European Commission’s “GDP and beyond” (EC, 2009), the Stiglitz Commission (Stiglitz et al, 2009) or the OECD’s “Measuring the Progress of Societies” (OECD, 2009) aim to promote the development and implementation of environmental, social and economic indicators that better measure prosperity and wellbeing. This is essential to support political decision processes with more comprehensive but still simple information.

However, developing indicators takes long and gathering data for these indicators is a time-consuming process. The Sustainable Europe Research Institute (SERI, 2011) has come forward with a pragmatic approach to measuring progress with indicators and data that are already available or will come in the near future. Three ‘frontpage indicators’ (in addition to more “headline indicators”) are proposed: Total Material Consumption (TMC) as a measure of environmental performance; subjective wellbeing as a measure of social performance; and GDP as a measure of economic performance.

These three frontpage indicators allow a rapid, easily understandable and broadly communicable monitoring of the overall direction and trends of development. It will be essential to set targets for all three indicators and to set them in relation to each other, for instance actual TMC/cap could be related to a material consumption target of 6 tonnes per year. The frontline indicators can also be used on different levels – to describe TMC, income and wellbeing of specific persons – or of companies, or even on the product level (in the case of TMC and GDP).

8 Conclusions

A better understanding of the upsides and downsides of economic growth as well as of the drivers and barriers to continue the current path of development not only provides insights into reality which are often obscured by blind optimism and a lack of critical thinking. Questioning the growth paradigm is moreover essential to shaping new forms of development that avoid negative consequences and enable prosperity, jobs and social inclusion within a functioning and flourishing natural environment. Since infinite material growth is impossible in a finite world, it seems wise to look for alternative paths of improvement without relying on more and more production of goods. But is this possible without steering our economies into a deep economic crisis?

In the preceding chapters we presented seven interrelated lines of arguments, dealing with consumption, employment, technological progress, the environment, capital accumulation, distribution and general progress of the society, from which vital ingredients for a new type of growth can be derived. We shed some light on both positive and negative aspects of growth, but also on the drivers of growth that are largely responsible for the ever increasing amounts of production and consumption. It should not be a reason for concern that many of these drivers are weakening, partly because of the aforementioned negative consequences, but also because of other societal trends, such as the ageing of early industrialised societies.

Given this weakening of drivers, it seems even more wise to think about how the positive consequences of growth can be safeguarded and the negative ones avoided in a development that does not depend on high growth rates which become more and more unlikely. Emerging economies such as China or Brazil do not face this problem yet, since their drivers of growth are still strong, but if they follow a similar growth as the 'global North', they may face the same challenges later on.

The first driver, consumption, was especially strong in the second half of the 20th century and is often associated with the positive aspects of economic growth. Yet, increasing consumption seems to contribute less and less to our wellbeing as we become richer and thus loses its strength as a driver for growth. More and more people look for new ways of meeting their personal needs and increasing their wellbeing without relying on ever more material production.

Increasing labour inputs is the second main driver and another argument why we seem to need economic growth: growth creates jobs. Yet, work becomes more and more stressful for many people participating in the labour market while others remain unemployed. Economic research suggests that this strong link between growth and job creation is becoming weaker. Moreover, the labour force is growing at a lower rate in many rich economies due to the aging of societies. It is therefore important to look for new labour market regimes that help to create jobs without relying on economic growth. With labour productivity still increasing while demand is weak, a reduction of working times (per week, per year, over one's life time) could bring some relief.

Economic growth itself is often regarded as a main driver for (international) competitiveness and technological progress. But new technologies are increasingly questioned for their risks, such as genetic engineering, nuclear power and nanotechnologies. To renounce the use of these technologies means also to abandon one of the main drivers for growth.

Some of the most negative consequences of economic growth are those for the environment. The other side of the same coin is that the availability of cheap resources and the carelessness about the negative consequences of their use were also among the main drivers of growth. An ‘absolute decoupling’ of resource use, meaning an absolute reduction by a factor of five or even ten in highly industrialised and therefore highly resource consuming societies, will make it difficult to maintain high rates of the same old type of economic growth. It is a political decision if these can be compromised.

One of the main political arguments for not accepting low, zero or even negative economic growth is related to tax payments and financing the welfare state to allow for further redistribution from rich to poor parts of the society without really ‘hurting’ the rich (they would just receive a smaller part of the increase but still get more every year). Increasing government spending is often seen as key for economic growth, especially when private demand is low. Faced with increasing inequality in many countries, even in times of positive growth, governments must look for new strategies to increase people’s wellbeing, especially when growth rates are low. This may include reforms of fiscal policy, notably by phasing out environmentally harmful subsidies and shifting taxes from labour to resources. Finding ways to reduce poverty, achieve a fair distribution of income and resources and ensure a high quality of life and wellbeing without reliance on economic growth will be an important political challenge.

Finally, we dealt with the notion of progress in modern societies and the need to set new targets for development that go beyond GDP. As the societal goal of economic growth is being challenged by additional (and sometimes competing) goals such as wellbeing, environmental security and social inclusion, we will need to improve the measurement of societal progress. Strong developments ‘beyond GDP’ are already under way in many countries and the European Union. This process may be further strengthened if we find a new balance in terms of the targets we set for our own future development. While high GDP may remain a valuable indicator for the state of the economy, additional indicators to reflect wellbeing and resource use may help to provide a more realistic picture of societal development. A fair distribution of progress in all these dimensions both within societies and on a global scale may help ensure an inclusive development and a peaceful future for the expected population of nine to ten billion people on earth by 2050.

Shaping economic growth in a way that does not erode society’s (and thus the economy’s) own natural foundation requires comprehensive reforms of the current economic system and a rethinking of the values underlying its logic. This paper has only touched upon some of the major institutional changes that will be required to ensure that the inevitable transformation will not jeopardise our wellbeing, but rather will serve to maintain or increase it. It is intended to fuel the debate about what kind of growth is sustainable. A key point to remember and to discuss in this debate is the fact that even zero economic growth does not imply that a country owns or earns less than in the previous year, but rather only that it does not earn more. Instead of arguing whether or not we like growth, we need to discuss what kind of growth really matters and how to make room for it. Do we need to reorganise society and if so, in what manner in order to achieve this kind of positive transformation? How much growth and in what form, is possible within the limits of the planet? Now the floor is yours for thinking and arguing about, but more importantly, for changing the future of economic growth. The second part of this book

provides 18 contributions from international experts and stakeholders on many of the aforementioned aspects.

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