

Megatrends in population, growth, employment, and development

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Summary

The reasons of strengthening growth and employment problems of the advanced world are seen mostly the same way by decision makers and societies. The dominant diagnosis: the advanced world, and especially Europe, has become too convenient: too many people work too less. Consequently, the dominant therapy is always the same: jobs have to be established, programs to stimulate growth have to be started, retirement limits have to be increased, and more people have to work more. The article tries to find the answer for the question, whether these ways are viable in the 21st century or not. We search for “megatrends”, i.e. regularities independent from the intentions of administrations and societies, which determine which way the advanced world can turn. The study represents four such regularities.

1. In the advanced world, the population is heading towards aging, which leads to the unstoppable reduction in active/dependent population ratio;
2. In the advanced world, the rate of the paid work is also shrinking unstoppably;
3. In the advanced world, the economic growth is reducing deterministically;
4. In turn, economic development is accelerating.

The world is ignoring these megatrends, and is steadily looking for the solutions to the present problems using the mindset from the past. The logic of the past cannot answer the questions of the future, which is already knocking on the door. For this reason, there is no other way than changing the mindset.

Key words: economic growth, wage work, total fertility rate, mind-set change.

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The world is in crisis. Governments, politician forces and societies are panicking; they are searching for immediate solutions for their problems. Decisions makers in the developed world almost everywhere believe that the causes are the same; they look for the same solution. The dominant diagnosis is: the advanced world, and especially Europe, has become too convenient: too many people work too less, the social safety net is too wide. The above seriously decreased competitiveness and initiated the downward spiral of indebtedness. Consequently, the therapy is to decrease government spending - first of all, social subsidies, pensions, education and health services. Retirement age has to be increased, working hours must be extended and more people have to work more and harder. This will restore the former harmony, growth will return, unemployment will decrease, competitiveness of the developed world will increase and states with debt will return to balance. China, with extremely hard-working workers on low wages, looks like a good example: they are much more competitive than us. In Europe the problem is exaggerated by the fear of "aging population", where less and less working people must support more and more pensioners. In the US another trend is prevailing: "new industrialization", which would restore its former glory, when the US provided manufactured goods for the whole world, providing employment to tens of millions of engineers in gigantic factories.

This time we do not analyze or criticize this theory and the diagnosis. We will discuss whether there is any way to reach the target proposed by the therapy - just like in case of building any roadmap; first we must find available paths. In this study we borrowed the methodology of John Naisbitt [John Naisbitt (1982)], which he applied in his work titled "Megatrends". In this study the author, as a result of several years of research, revealed 10 underlying trends and changes, which were beyond the control of the given societies or governments and influenced not only independently, but also stronger and stronger the characteristics of the economy and the future of the society. In addition, these "megatrends", as called by the author, determined future's roadmap. Reading this work today is amazing - megatrends revealed thirty years ago almost without exception determined the future, our present days. This study does not provide short term solution, especially not for Hungary today. We are not engaged in analyzing the current position of the Hungarian economy, but in finding the existence megatrends which determine the future.

Historical limits of the study:

Socio-economic progress is not linear; stages with very different specific characters are following each other. Based on experience gained over the last few thousands of years - and with some degree of simplification - we can establish the following stages:

- *Pre-historic stage*

In this earliest stage people simple lived on the land, the collected everything required for survival from nature. Hunters and gatherers lived in tribes, wandering from place to place.

- *Archaic stage (world before mechanization)*

In this stage people produced goods necessary for everyday life themselves. Neither machines nor external energy sources are used in production. All goods were produced by human or animal work; since extremely large amount of energy was required - at least in temperate climate regions - almost every available human work potential was used for satisfying societies' requirements. In this stage everybody worked young and old, men and women, with the exception of a few privileged people.

- *Age of mechanization spread of machinery (age of basic mechanization)*

Machines are used in key economic activities with deploying external energy sources (coal, steam). At the beginning machines were used only here and there, mechanized factories occupied only sporadic islands in the traditional agricultural and landscape. Although productivity increased significantly, additional goods were not sufficient for lifting the living standard of the masses considerably. Surplus goods were gobbled up by initial capital accumulation and investment (factory buildings, basic machinery and equipment warehouses, stock etc.), by establishing modern infrastructures and by modernization of armies. The number of people living on wages increases rapidly with extra-long working hours without paid holidays. Knowledge of modern technology becomes more and more significant, but only a few well-paid engineer and tradesmen are necessary for the production; most of the workers are uneducated, semi-skilled or unskilled laborers (machine operators, material handlers). By the end of this stage basic industries, transport infrastructures, railway networks and major heavy industrial complexes are established. Cities with millions of people are built, connected by road, rail and sea transport lines. At the same time, still large number of people is working in agriculture, small factories and in the service sector using manual labor. Households are not mechanized, electric power yet to be connected and most of the population lives in simple homes without basic amenities.

- *Stage of full mechanization*

In the following stage machinery and external energy are generally used in all production areas and human activities. Human or animal labor almost disappears; huge megacities are built with full mechanization. Households and armies are fully mechanized, including transport and communication. The entire human civilization is based on and interconnected with machines without exception. This time almost everybody fit to work are working for wages. Although the ratio of highly educated or skilled workers (engineers, scientists, economists, tradesmen) increases significantly, the number of semi-skilled laborers is still high. The need for full employment and long hours is less prevailing, because production is highly mechanized and organized - although human presence in production is still essential. In this stage more and more people can leave the workforce (for example, children, young and sick people, pensioners). By the end of this stage households are mechanized, the use of cars is widespread and most of the population lives in high quality, comfortable homes with all services. Networks of motorways, railways, telecommunication and public transport are almost fully developed.

- *The stage of "new economy"*

Since this stage started only a few decades ago, we yet to find the proper name. We are only on the very beginning of this age. New technologies, such as primitive informatics, nuclear power, nanotechnology and organizational solutions based on mathematic models (for example, operation research, theory of weak networks) already present in the previous stage, are spreading. Although detailed descriptions of this stage are yet to be defined, we already can see the main trends:

- ❖ Progress in technology will make direct human participation redundant in production. Productivity increases dramatically and, as a result, less and less people is required along fully automated production lines.
- ❖ Needs of the society are better and better satisfied with products requiring less and less material and energy. For example, the internet satisfies communication needs much better than the post office without employing thousands of people and using tons of materials. In comparison to energy production based on oil and coal, the operation of nuclear power plants or wind farms require only a few people without using huge amounts of non-renewable resources. Recycling is widely used, which requires less raw material and energy than producing goods from new materials. Unused energy costs nothing (for example, energy-saving lights, insulation of walls, passive homes). New organizational and scientific solutions are spreading in production with using less and less (or zero) labor, material and energy and providing better and better goods. For example, logistics based on linear programming, world standards, irrigation and district heating using optimized programs.
- ❖ Consumption is radically changed. Unstoppable growth of past ages has been replaced by stagnating volumes and improving quality in the developed world. Food consumption is not growing in the developed world, megacities are slightly shrinking. Growth in the number of houses is replaced by maintenance, modernization and improvement. Green thinking is getting trendy in the developed world; young people adopt a new approach to life. Selective rubbish collection, modern water management (rainwater collection), finding more economical household appliances (i.e. water saving washing machines) and using more and more public transport are gaining grounds. In cities rich yuppies, students and highly qualified white collar workers are using bikes. All the above are pointing to a new approach to life in this "new economy".
- ❖ All developed societies - without exception - are moving in the direction of long term decrease in population. In many countries the total number of the population has already been decreased. In these societies this trend helps in controlling the force to compulsive growth.

In this new economy very unusual, and new, conditions have been developing. Whilst human needs are better and better satisfied, the need for human labor, raw materials and energy (not only the specific, but also the absolute need) is rapidly decreasing. Ideas of a few, well-paid intellectuals are frequently come up with solutions which result in huge savings in - or total elimination of - raw materials, human labor and energy. For example: insurance policies obtained via the internet,

e-banking, on-board computers in cars which manage motorway tolls and log other operating conditions.

In this new economy humans will be polarized in three classes. One class is formed by highly-qualified and well-paid engineers, scientists and skilled workers, including highly qualified psychologists, personal trainers, financial advisors, teachers etc. Operators and semi-skilled workers required for serving and maintaining machinery and automatic equipment belong to the second class. These workers are engaged in manual work, in feeding, cleaning, servicing (for example, they move materials between machines) and maintaining machines and in repairs. This class includes postal workers, parking meter supervisors, ticket vendors, gatekeepers etc. Since these jobs are easy to learn, these operators become more and more defenseless and as technology improve, their jobs become redundant.

The most significant change is experienced by the third, growing class of the population. More and more people become unnecessary and redundant - at least as far as employment in production are concerned. But as far as consumption is concerned, they are essential for maintaining - let alone expanding - the market economy. Supplying this ever growing class - surplus people not required in production - will be the main purpose of production of goods.

In this new economy, whilst demands are better and better satisfied, raw materials, labor and energy required for this purpose are unstoppable contracting.

Economic stages in practice

Of course, the above model is only a theoretical description. In real life the above stages are not so clearly separated, they overlap each other, especially in the time of transitions. In addition, these stages are not formed clearly in real economies; in general, they are mixed with each other up to a certain level. Although components of the archaic stage, basic and full mechanization and the new economy are existing side-by-side in the world, in America, Europe and China, their ratio is different. In the US full mechanization and the new economy are dominating. In China the stages of archaic and basic mechanization carry the weight, although full mechanization is expanding rapidly. The new economy is in minority. Furthermore, the above stages can be mixed within a single economy, determined by geographical regions, industrial divisions and by different level of social development. For example, engineering can be fully mechanized but garment production not; cities along the seaside are fully mechanized but inland areas remained in the stage of archaic economy. Armies could be fully mechanized, but households are lagging.

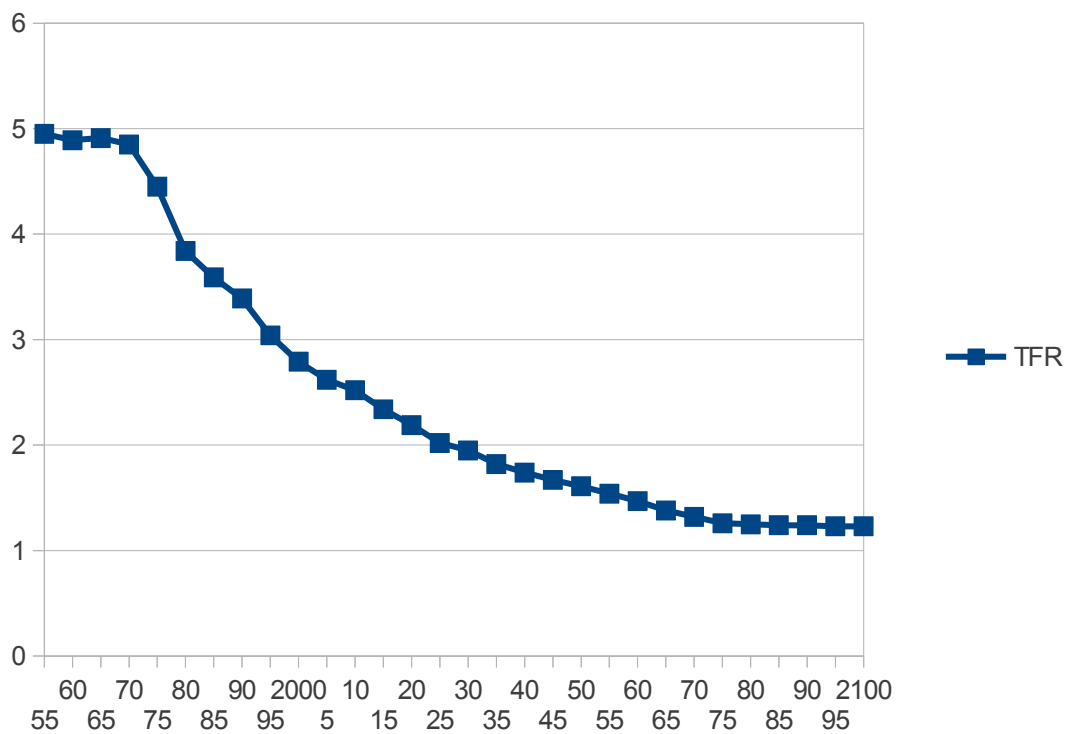
In the following we will investigate dominating megatrends of our age, based on the above history of economies.

Megatrend 1: economic development and aging of the society

Aging of the society is not a Hungarian or European phenomenon. Statistics revealed that approximately 80-100 years ago propagation conditions of the human

race have seriously changed. This underlying trend remained almost unnoticed, because the population enjoyed significant growth during the same period. The essence of this change is not the actual increase in the number of people, but the propagation drive of the population which is the basis of long-term survival of the race. These two things are not the same. The basic and essential drive behind long-term population growth is the total fertility rate (TFR). This rate shows the number of children given birth by one woman during her lifetime. If this rate is below 2.1-2.2, the population will be reduced on the long-term, regardless of the current growth.

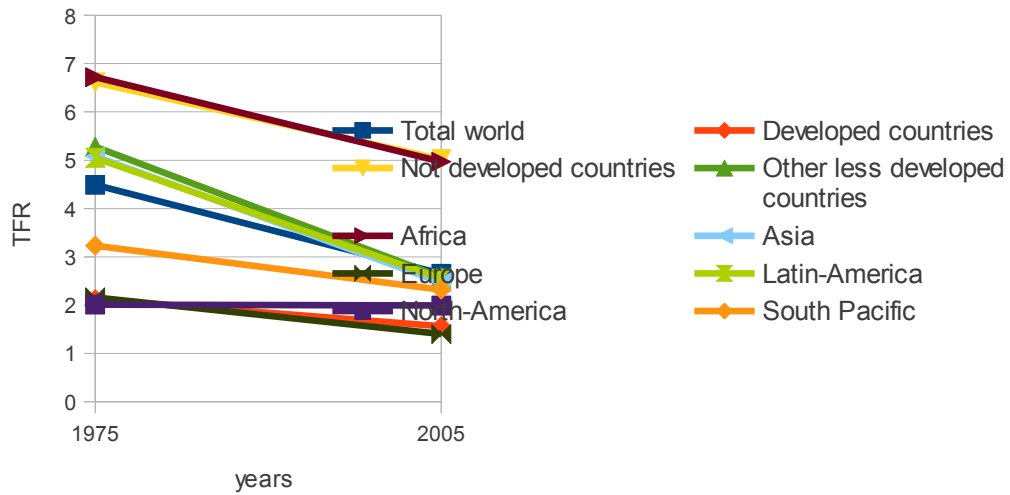
Fig.1. Changes in TFR in the whole world between 1950 and 2100



This diagram indicates that as far as the world as a whole is concerned, TFR is decreasing linearly over the last 50 years and this decrease, according to calculations of demographic experts, will continue until 2100. As a result, the total population of the Earth will peak approximately in 2050 before reversing. In accordance with the same calculations, TFR of the world will drop below 2.2 in around 2020.

Fig.2.
Source of data: UNDATA (2011)

TFR detailed according to groups of countries and regions in 1975 and 2005



The table showing regions of the world indicates that during the last 30-35 years TFR has been decreasing significantly not only worldwide, but also in each country or region! This indicator has almost halved! The most significant conclusion of this table is that that TFR has been decreasing radically everywhere

despite the fact that there are many regions where it is still well over 2.2. But as far as the general trend is concerned, the downward angle of the diagram is the most important factor, not the absolute value of each year. This fact clearly indicates that the most significant indicator of propagation of the human race is going to turn into negative on the long run; *regional differences are shown only in the phase of this change.*

Another obvious pattern of this Megatrend is that the value - and phase shift - of TFR is related to the development level of each society, both in counties or regions. In addition, this rate is lower in more educated, urbanized and higher-income groups. Total population growth is the resultant of two opposite trends. Economic progress increases the level of urbanization, education, wealth, birth control measures and applications, which are reducing TFR. At the same time, average age increases dramatically, infant mortality and epidemics are decreasing; all of them have positive impact on population growth. These two trends have been in action since the age of basic mechanization, but at the beginning their positive impact on population led to rapid increase in population. Later the general public became less and less keen on propagation, but the increase in average life, decrease in infant mortality etc. managed to keep the balance despite the fact that the resultant of the two effects points to the direction of decrease. This is the explanation behind the turn of the trend, when initial and rapid population growth was transformed into decrease, which is lasting the situation today.

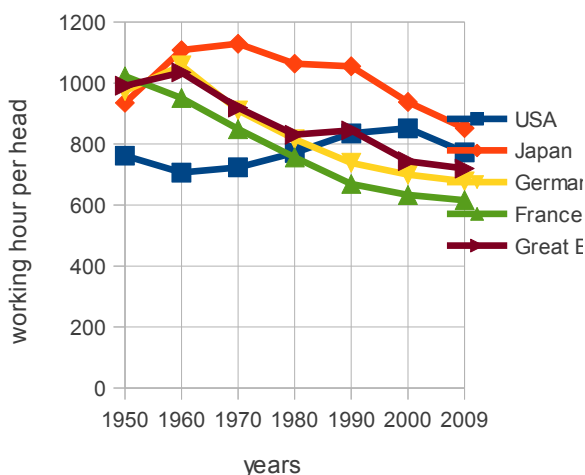
Long term, general and monotonous decline in TFR proves, without question, that this is an unstoppable Megatrend. Humans turned into the direction of long-term decrease in population and governments, politics and churches cannot stop it. As a matter of fact, nothing can stop it. Certain government measures (make abortion illegal, official population programs, like in Hungary in the seventies etc.) may have slight and temporary impact on the trend without any long-term influence. Although these interventions may result in some improvement over a couple of years, the improvement usually "melts away" within a very short period of time. People who believe that nations below the rate of 2.2 will disappear and poorer countries - which have higher rate today - will replace them forget about the phase shift. Soon or later every nation will reach the negative rate, but in different times. Aging of the population is one direct consequence of decreasing TFR, this is simple arithmetic. The population Megatrend clearly indicates that long-term decrease in the number of people in developed countries cannot be stopped on the long run, therefore the ratio of working/supported people will not "improve", quite the contrary, more and more retired people must be supported by less and less active worker (regardless to the number of people actively working). Ageing of the population cannot be solved, but this is not an unsolvable economic problem. The fear of lower active/inactive ratio is based on false logic. Inactive people are not supported by the *number of active workers*, **but** by *the output of the economy*. If this output does not change, or even increases - which is the situation in the developed world - by the result of less and less work, less active worker will be capable for supporting the inactive population. The reason? In the mechanized age economic output does not depend on the number of workers, but on efficiency (level of development), as we will explain later.

Megatrend 2: stagnating or shrinking number of people on wages in the developed world

Before going into details of this Megatrend, we would like to clarify a couple of basic principles.

- We will investigate changes in paid work only in the developed world. We will pay less attention to less developed nations because statistics in these regions are very unreliable and most of the population still lives in the archaic age.
- We define working for wages when the employee is free to choose employment and receive wages in accordance with labor regulations of the given country; these conditions are transparent to statistics.
- Our investigation covers only the volume of work performed for wages but not all human activities, such as actual and useful activities - performed for the benefit of the family, local community, hobbies and other (for example, self-sustaining work) - even if financial rewards or other economic advantages are clearly visible.
- The volume of work performed for wages and the progress of economy are correlated. In this context the progress of economy is the independent variable and the paid work is the dependent one. Accordingly, progress in economy determined the volume of paid work and not vice versa. If the available paid work is not sufficient or poor quality to satisfy internal demands of the economy, the attraction force of the market will restore, sooner or later, the balance but with certain problems. For example, with introducing vocational training, increased wages, rapid technical development, guest workers etc. On the contrary, if we want to increase the labor force above the level of the economy's demand by using forced measures, production will not increase but the efficiency of labor will seriously deteriorate.
- The most accurate indicator of the work performed for wages is the number of hours worked per person in this field; in an economy when the volume of work performed for wages would remain the same when more people works less or when less people work more. The information about average working hours performed by one employee is also important. Let's investigate the long-term change of volume of paid work in the developed world. We selected five countries which have been developed for over a long period of time and large enough to

3/a Number of working hours per head, 1950-2

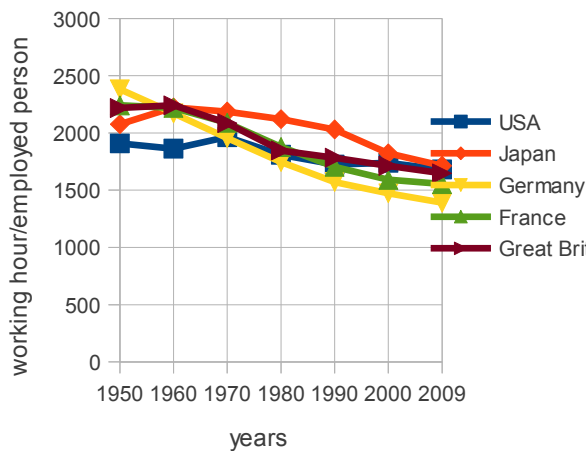


to compensate for accidental or casual factors; these countries provide statistics prepared by the same methodology over the period of 60 years. These countries: USA, Japan, Germany, France, Great Britain.

Fig. 3/a, 3/b

Source of data: *The Conference Board* (2010)

3/b Number of working hours per one employed per 1950-2009



The two diagrams clearly illustrate that in the last 60 years in these countries work performed for wages by one person has been dropped by an average 15-40 %, whilst the work per one head of the population by 0-40 %. Among the above countries the least decrease of the volume of paid work per one head of the population has been experienced in the US; during the above period this figure remained almost unchanged in the vicinity of 800 h/person/year. But we must admit that the starting base in 1950 was also the lowest in the US. People in the other countries worked much more than the Americans, in fact the rest was moved

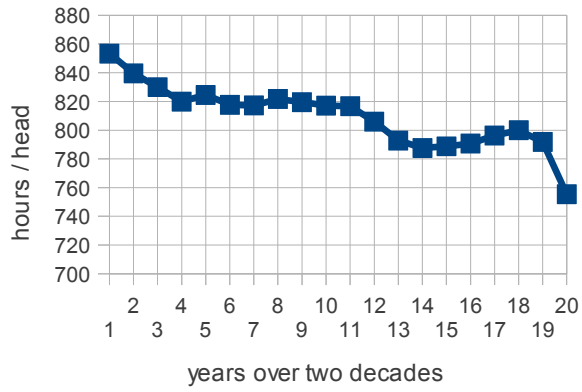
to the constantly low level of the US population. Today in these European countries the length of working hours is generally less than in America, although the last decade this figure has been significantly reduced in the US too. In Japan, where people used to work a lot more, the volume of work has been reduced significantly. In the five selected countries the volume of paid work per one worker was significantly reduced during the last 60 years. Investigation of the intensity of reduction in paid work during the last two decades leads us to a very interesting conclusion in the selected countries.

Learning about relevant specifications of these countries during this period is extremely important, because in this period the "new economic age" accelerated very rapidly in these countries, which provide 45 % of the world's GDP. Consequently, they are the best examples to illustrate employment in countries which have passed the stage of full mechanization.

Fig. 4/a Number of working hours per head in the five most developed countries together, 1990-2009

Source of data: The Conference Board (2010)

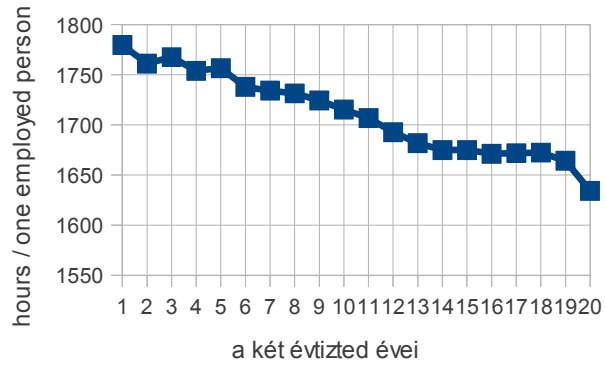
Fig. 4/a.



4/a. Number of working hours per head in the five most developed countries together, 1990-2009

Source of data: The Conference Board (2010)

Fig. 4/b



These diagrams clearly indicate that in the periods of the 60 and 20 years the volume of paid work did not increase, but significantly decreased in the economy of the most developed countries. Of course, this trend is prevailing only in the five, large developed countries. Investigation of the remaining economies reveals several interesting information and variations. In diagrams of specific countries we see frequent individual variations. Diagrams of various nations reflect the impact of wars, merging of countries, increase in activities demanding high level of work and the introduction of new technologies. In addition, diagrams of specific nations can be influenced by bad government decisions and social changes (i.e. revolutions, political changes). In period in question countries may jump from the age of basic mechanization to the age of full mechanization or even to the age of new economy. In these cases employment diagrams initially increase, because workers are drawn from the archaic economy, before turning downwards, when increasing development starts to reduce the need of paid work. The best examples are Japan and South-Korea.

In some cases the diagram is very flat, where indicators illustrating the volume of paid work remain unchanged over relatively long periods of time; in the same time there are diagrams which show periods of rapid increase followed by fast decrease.

In most developed countries in Europe the decrease of paid work is very significant. Examples: The Netherlands, Denmark, Sweden, Italy, Spain and Austria. Diagrams indicating the volume of paid work in various countries may show short-term changes in the general trend when the volume increases over certain period of time. This short period may represent up to 5-10 years. These increases can be explained by local conditions, for example, rapid increase in the employment of women, economic bursts. But most of the counties are always following the path of the Megatrend. During the 60 years period in question, in countries where the age of full mechanization has already been reached, the volume of paid work will never increase by any significant factor, quite contrary, we can expect further decrease.

Expected changes in the volume of paid work is better illustrated with following logic and starting from changes in technology than looking only at numbers. During the last 2-3 decades improvements in technology in the developed world reduced / without question - the volume of paid work. Essentially we all changes point to this direction. The most significant section in the development of technology is the revolution in informatics. Office work today is nothing like it was 20-30 years ago. Informatics penetrated in actual manufacturing-service processes. Production of electronic circuits multiplied by thousand and million times; today the work of milling or casting metals has been reduced to supervise computer-controlled equipment; telemetric control of various equipment (heating, irrigation, warehouses, ships etc.) is rapidly expanding, including the centralized supervision of transport network with the help of GPS. Robots are employed almost everywhere, as well as the use of equipment requiring minimum human presence. As a result of changes in technology, many products - which required human work - became obsolete and disappeared, for example, from consumer electronics, communication, printing of books and daily papers and from photography.

Since the pace of change in technology is extremely fast, a new, special contradiction surfaced.

In many cases it is difficult to comprehend why expensive or less efficient human labor is used instead of obviously cheap technologies or organizational solutions which are readily available. What is the reason behind using primitive, paper-based tickets, bank notes etc.? What explains the existence of paper-based offices, the lack of electronic signatures, authorities which request printed certificates from clients, when such certificates (tax returns, birth and marriage certificates, character reference) are available from another state office? The explanation is simple: conflict of interest, organizational difficulties and lack of knowledge. Despite these problems, the future is clear: the volume of paid work will be reduced faster and faster, because appropriate technologies are readily available, only to be implemented.

In economies reaching the age of full mechanization - investigating either on the basis of figures or practical analysis - paid work will not increase, quite to the contrary, all signs indicate that it will be reduced significantly. Governments have very little room to change this.

Forced administrator measures (limits, duties, unnecessary state employment, and public work) may achieve local and short-term "results". Certain macroeconomic actions (encouragement of investment, subsidizing industries requiring high level of human work or reducing the cost of labor) may also achieve local, limited increase in the volume of paid work, but these actions last only for a few years and the Megatrend will prevail again. In accordance with this trend, paid work will be reduced more and more dynamically in the future and in the developed world less and less people will work less and less. This Megatrend will also be unstoppable.

Megatrend 3: the bell-curve of growth

An old, but generally forgotten basic principle of the economy is the fact that growth and development are not the same. Development and growth are two sides of the same thing, namely the progress in economy. In practice these two sides are present side by side, but do not move necessarily in synchrony. Sometimes growth, sometimes development is the more intensive one, but they can also be fast or slow at the same time.

In the introduction of Megatrend 3 we will focus only on the growth side of economic progress, the development side will be detailed in Megatrend 4.

The meaning of growth

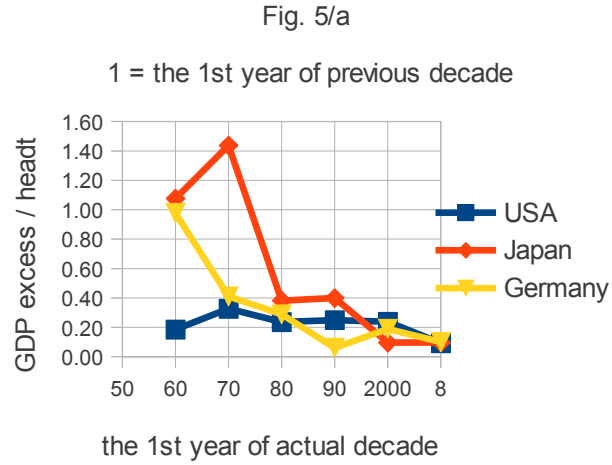
Economic growth is the expansion of an economy showed in indicators expressed in real monetary terms. An economy is growing when the GDP per head, expressed in real monetary terms, is increasing. This indicator itself tells nothing about whether this increase has satisfied human needs at a higher level or not.

Change in indicators of growth

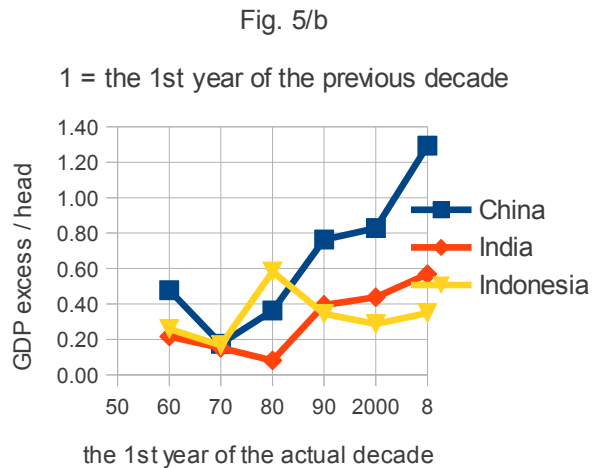
We will illustrate growth by presenting long-term changes in the real per capita GDP. We selected three-three countries from the developed and from the developing world, such as USA, Japan and Germany and China, India and Indonesia. We need to investigate large economies to filter out factors with occasional influence in growth (for example, the role of an oilfield, key sea port, or banking center). Figures of the 2008 crisis are also included in our investigation, because crisis is part of the long-term events.

	USA	Japan	Germany	China	India	Indonesia
GDP in thousand billions (in 2010, current dollar value)	14.5	5.5	3.3	5.9	1.6	0.7
Percentage of world GDP	23.8	8.7	5.2	9.4	2.5	1.1
Change in GDP/person in 2009 =100%)	-3.5	-5.2	-4.5	8.6	5.9	3.3

5/a.: Increase in GDP/head in the 3 most developed countries
 Source of data: The Conference Board (2010)



5/a.: Increase in GDP/head in the 3 developing countries
 Source of data: The Conference Board (2010)



In these two diagrams we illustrated only changes lasting over decades in order to filter out "annual vibrations", which are not interesting in this study. Figures in the diagram represent the increase in per capita GDP, showing the difference between the first year of a given decade and the first year of the previous decade. For example, in the case of Germany, the figure of 0.4 in 1970 means that the per capita GDP increased by 40 % by comparison to 1960.

In the USA, during the period of 1950-2000, per capita real GDP increased relatively evenly with low-medium values of 20-30 %. In the decade following the year 2000 the increase significantly dropped to approx. 10 %. In the case of Germany and Japan, in the period of 1960-1970, the increase was much higher than in the USA. From these diagrams one fact is very obvious: the figures of GDP growth are moving in parallel with the stages of economic development. In America, as a result of relatively even progress, the stage of full mechanization was completed by the fifties and sixties. Germany and, a little later, Japan also reached the stage of full mechanization in the decades following the rebuilding the economy after WWII. By the end of the seventies in both countries households have been fully mechanized, passenger cars reached saturation levels, public utilities have been rebuilt - they reached the full mechanical age and as a result, the speed of growth slowed down, just like in the US. All three countries, practically at the same time, in the period of 1980-2000, reached the age of "new economy". As a result, the diagram of growth in Germany and Japan became identical to the American diagram; in the last two decade all of them reached the 8-10 % per decade.

The three developing countries subject to our investigation, China, India and Indonesia, show a totally different picture. In the fifties and sixties all of them - India in the seventies too - showed very slow growth rate. In the following period this rate increased very rapidly in both China and India, but Indonesia showed very impressive figures too. In this group of countries there is a very significant correlation between the growth rate and stages of economic development. In this group in the fifties we hardly can talk about the start of basic mechanization as a large part of the population was living in the archaic age as well as in the prehistoric age. Nomadic life, just like before civilization, was also widespread. After 1950 slow, hardly visible changes in the fields of education, basic mechanization, state organization and national distribution were introduced in these three countries. After a while, as a result of accumulation of these changes, the economy started to grow, at first slowly but with an accelerating pace. Today all three economics reached the level of basic mechanization and moved into the age of full mechanization. The "new economy" also appeared here and there. The diagrams clearly indicate specific impacts (for example, the Cultural Revolution in China and phase shifts (late start of the growth in India), but in these three countries the rate of growth was much faster than in the developed world with showing upward trends. In these developing giants not even the world economic crisis was sufficient to break this upward trend.

The question is whether we can generalize these trends as governing laws of the world economy. Since the above selected countries provide more than half of the Earth's total GDP, we believe that generalizing their conditions is justified. Investigation of growth diagrams of the remaining countries reveals basically the same trend. Developed countries in Europe grew very rapidly, sometimes up to 6-10 %/year, after the war, but by 1990 this rate slowed down and stabilized at 1-2%. Among others, France, Italy and Austria also followed this trend. As a result of wars

(Vietnam), abundant resources (Kuwait) or a special position in the world economy (Taiwan, Singapore), some countries occasionally may deviate from the general trend, but never move against the trend. In summary, we can establish the following general trend in growth:

In the archaic age time is almost at a standstill. Annual growth, in the best case, may reach 1 %. This figure may be altered by epidemics, wars, colonization and migration. The appearance of basic mechanization rapidly accelerates this historical rate. This trend prevails in almost the entire age of full mechanization. But as soon as full mechanization is in progress, this rate is getting slower and slower and when the "new economy" appears, growth returns to the very low figure experienced over many thousands of years in historic times.

The general trend is simple: the appearance of machines suddenly "kickstarts" the very slow economic growth (judged by today's terms) experienced in historical times, but as soon as full mechanization is achieved, the rate returns to its historical value. The well-known bell-diagram illustrates this process; in different countries the width of the bell may vary up to 50-100 years. The economy of each and every country follows its own bell-diagram. Countries in the age of basic mechanization are located on the upward side, countries in the new economy on the downward side. The economy in every country will slow down - only in different times, when the country in question passes the age of full mechanization.

Basically, this is the Megatrend of growth. This trend determines the present and future growth rate of a given country. Specific factors or government actions may alter the growth of a country temporarily up to a limit, but the basic trend cannot be changed on the long term.

Megatrend 4: acceleration of development

The principle of development

In economic progress we talk about development when individual and communal needs are satisfied at higher and higher levels and/or the load on environment, raw material and energy required for production - including working hours - are reduced. The level of development indicates those production and social stages which are achieved by the process of development. Development per se does not reveal anything about the presence - or absence - of growth. Development and growth may march hand in hand, but this is not necessary, they may separate from each other.

The level of development is determined by the following three factors:

- *Level of means of production.* This goes without saying, it means the level of technical development (level of products, production and the level of machines involved in production), including the level of science and working ethics involved in production.
- *Proliferation of developed technologies.* Development of a given society is not determined by the occasional presence of high-tech technology (for example, spaceships or nuclear weapons), but by wide application of developed technologies (motor vehicles, computerized spark erosion,

computer, households automatics etc.) which cover the everyday life of entire society and industry. Development means general application of modern means of production and engineering achievements.

- *The general approach of the entire society and individuals to the latest technology.* A better indication of the level of development is the time since the given society is been engaged in using the latest technology in general. As time is going by, the approach to appropriate, developed age will develop in the entire population. Needless to say, the meaning of the above statement is different in each age. For example, in the age of full mechanization, this means the use of machines on an everyday basis, including appropriate maintenance and replacement of the machines in question, including the appropriate attention to and correct use of these machines. Properly developed culture of the given society - although harder to define - is another very important, if not the most important aspect of the society, which includes general education, general application and appreciation of knowledge, inclination to innovation, competitive approach etc.

Changes in factors of development

Description of development with specific factors is not an easy task, only an analytical approach and assessment methods can be applicable. When investigating development, sociology, engineering analysis, studies of specific cases may be more useful than traditional economics using monetary indicators. Although it is impossible to present exact statistics or diagrams indicating the progress of development, we can establish the fact that development is - in general - accelerating. Studying history reveals a lot about the speed of development. In the archaic age development was almost at a standstill. Hundreds of years brought very little change. If a man from 500 BC could be transported to 500 year later, he could experience very little, he could adapt very quickly. In contrary, somebody from 1880 would have serious difficulties in adapting to 1930 - to motorcars, street lights, electric power, movies, busy cities etc. Our man from 1880 would be totally lost in 1990, would not recognize his trade he used to be familiar with. As general mechanization is progressing, "diagrams" of growth and development will take different paths. Whilst development is on the rise, growth in the developed world is moving to the downward side of the bell curve.

As far a growth is concerned, developing economies are moving upwards on the bell curve and take over the lead from countries already achieved the new economy. On the other hand, his change in the roles is not visible in the field of development. New innovations are - almost without exception - coming from the US, Japan or Europe. The future is made in the new economic age, like computer technology in the Silicon Valley (California), in energy production, in nanotechnology, bio-technology, communication, space research etc. But in the XXI century innovations are rapidly transferred - within months - to the developing world. China is the best example, where most modern technologies are applied in production, space research, armaments and transport with a speed never seen before. Almost every laptop, LCD TV, digital storage media, lithium battery and printer is manufactured in China. Most of the mobile telephones are manufactured in India, which is the home of the largest number of service providers in information

technology. So far this means "only" the application of new technologies, which are supplied by the developed world, where the "new economy" is already in place.

The future

All four trends illustrated above are stemming from the same source. Roughly 200 years ago machines appeared in the history of mankind. This event had a profound impact on traditional conditions. Population growth, economic growth and development in general changed significantly, including employment. This process still continues with dramatic changes. The developed world is moving in the direction of decreasing population and ageing. This means that the ratio of active/passive workforce will further "deteriorate". In addition, economic growth will be reduced steadily and surely - today almost zero - which means that the volume of paid work will also stagnate or diminish. On the other hand, development - mainly thanks to developed countries - will accelerate, which will further reduce growth and the volume of paid work.

The developed work suffers more and more from the above megatrends. They introduce more and more difficult efforts to reverse these megatrends. They apply the same recipes over and over during the last decades; they try to increase growth, reduce public spending, to "create" jobs, to increase "flexibility" in employment, to lift retirement age etc. Results of the last decades clearly illustrate the futility of these measures; the above megatrends have not been changed. In addition, common sense shows the uselessness of measures such as lifting the retirement age when less volume of paid work is required in production. This measure increases unemployment (both on benefits or hidden) without having any impact on the economy's production.

In principle, winners of the megatrends are the countries still moving upwards on the bell curve, but they are also affected by changes. Although huge - billions of dollars - surpluses are accumulating and the number of people on wages is increasing very rapidly, serious social problems are developing. In the developed world during the age of basic mechanization - and also later, in the age of full mechanization - the archaic economy was gradually and fully restructured.

In essence, every laborer - peasants, manufacturers, women in households - were transferred to paid jobs with smaller or larger conflicts. As a result, the world of archaic labor totally disappeared and the entire society was transformed into a new balance, to a social system organized at a higher level. The situation in today's developing countries is different. Earlier they also enjoyed a balance, albeit at a lower level. In archaic economics everybody worked very hard and very inefficiently for a subsistence living. The introduction of machines disturbed this thousands of years of balance. Hundreds of millions of people were uprooted from their archaic world and moved into the world of paid work, which is more efficient. There is no way to reverse this move, they never will return to their village, to toil the soil or to work as a coolie. Mechanical production eroded archaic employment opportunities. Electric power supply, power tools, machines, trucks, agricultural machines and cheap products (clothes, etc.) render large number of peasants, small plot holders, manual laborers etc. redundant. The race has been started. Rapid development transfers millions of people from the archaic economy, which further accelerates

development and increases production. In turn, more and more people will be redundant in archaic jobs. The technology provided by developed countries is much more productive and no growth can be sufficient to generate employment to people leaving the archaic world. The best examples are China and India.

In case of China - the envy of many countries - on the first glance people believe that 80 % of the people are employed, working hours are long, social services are poor and social security leaves a lot to be desired. But more detailed studies revealed that although unemployment in the cities stands only at 4-5 %, in the country an estimated 150 million people are unemployed. This is more people than all the people without work in the developed countries. People are required to obtain a special permit in their personal ID document (hukou) system to stay longer than 3 days outside their locality within the country. Also, a special permit must be obtained to work in cities or industrial centers. Approximately 200 million people have this kind of "guest worker" status. In traditional European terms they are a mix of guest workers and casual workers, who provide a buffer workforce; they are allowed to work in places where work is available and when this work dries up, they must return to their villages and wait to the next opportunity. This 150 and 200 million people is the most significant threat to the stability of the Chinese society. Of course, these two types of unemployed groups are overlapping each other. According to relevant calculations, at least 8 % annual growth is necessary to keep this social balance in place. This is the first priority in China today [Zoltán Szabó (2009)].

In India the situation is similar, where hundreds of millions moved from the archaic economy into the world of modern paid work. India employs a different method to manage the problem, but the most important factor of escape is high economic growth. But more and more productive technologies provided by the developed world reduce the requirement of paid work both in China and India. Nuclear power plants, software development, high-quality steelworks and car assembly lines using robots need no more workers than similar factories in the US or Japan. But the large number of potential workers available in the developing world - in case of high productivity - would be more than enough for the entire world. As a result, rapid growth and the necessary development are racing against each other. Although rapid growth may give work to excess people, development running in parallel reduces the need for more paid work. It is only a matter of time when - as a result of these counter-acting factors - the door of employment will be shut. More productive and modern is becoming the economy in China or India, sooner will stop the drain of workers from the archaic economy. As time goes by, the volume of paid work will be reduced in absolute terms in these economies too, similar to the developed world. The dangerous impact of closing the door of employment on the world is hard to overestimate.

In essence, today these megatrends render old, formerly useful solutions useless in the developed world. The road of speeding up economic growth, creation of jobs, increasing employment and improving the ratio of active/inactive people is not available any more. But societies do not admit this fact, governments, public opinion gurus and ordinary workers keep on pushing the old ideas. The reason? Our way of thinking (paradigm) burnt into our brain cells are result of thousands of years of experience. This paradigm determines our evaluation values and decisions, what do we approve, the right and correct things, and what do we disapprove, things to be incorrect and must be eliminated at any price. Our way of

thinking determines the directions to find solutions and rejects other ways. Anything outside the "eternal truth" of this paradigm remains beyond us; we do not even contemplate them. According to the basic axiom of today's way of thinking everybody should work as much as possible. Despite the facts of reality, we suppose that the correlation between the volume and work and the return of work is evident. Also, we believe that distribution of wealth on the basis of participating in work is the correct way. We cannot accept - or can accept only in very limited way - that people may be in genuine need. We totally reject the principle of civic (subjective) right. If today's society is forced to provide benefits, it must be constantly revised, justified and kept on the minimum, some kind of alms. The society still regards continuous and significant economic growth and monetary expansion as a basic requirement and value - if they stop, we panic and demand immediate action.

We never ask "heretic" questions which are outside the limits of our way of thinking. We never ask whether the turn into population decline on the already overpopulated Earth and population aging is a problem or not. Is it a real serious danger to halt growth of the economy whilst development is accelerating and we should work less and less? We never ask these questions despite the fact that our way of thinking developed over the millennia and current realities of the economy cannot be reconciled. Our old way of thinking cannot respond to problems generated by the new economy. But the megatrends do not "appreciate" this fact and the world is marching unstoppable into the new economy. Societies trapped in the old paradigm experience serious difficulties when realizing this problem and they try to solve them within the framework of the old way of thinking. They keep on trying to create new jobs, to revitalize the economy and to lift the age of retirement, of course, without any actual result. The real solution is to change our way of thinking. This is a mammoth task. There is hardly a more difficult problem a society is facing than changing paradigms and questioning and replacing axioms which have been valid for thousands of years. To resist megatrends is impossible. We must forget about our dream, about using yesteryears recipes to return to the golden old age. This is not possible. The world must abandon old dreams and must adapt to challenges of the future. Time is ripe to change the paradigm which is in harmony with the reality of the new economy [Judith Fekete (2007)]. Giving details of this change in paradigm and its consequences are beyond the scope of this study; we will deal with this in our next study, although a careful reader may find the essence of our next study from the four megatrends illustrated above.

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