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Exponentially accelerating time – growing security risk Outlook on the security challenges of the 21st century based on World Models

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Abstract

The basic idea of the research: accelerating time has created such negative phenomena that will have a significant effect on security policy in the coming decades. (Including, for example, population explosion, the increasingly stronger and wider economic and social crisis, the deepening economic inequality, the acceleration of economic, social and scientific development, the disintegration of human communities.)

The Club of Rome, playing the role of instigator in the investigation of world processes, and the World Models prepared by the Club already half a century ago indicated the most important problems of today and future. These problems are closely related to security and foster a feeling of insecurity of people's sense. The desirable harmony among nature, economy and society has disintegrated, and the economy and profit play a decisive role. The problems of the future of the mankind arise from this fact. The security policy of the 21st century must take into account these negative phenomena and develop an appropriate strategy.

Keywords: security challenges, uncertainty, World Models, Club of Rome, Future research, social and economic crisis, globalization, accelerating time, population explosion, scientific and technical progress

The age of uncertainty

The notion of security sums up in the broadest sense all those social, economic, and natural phenomena, processes, and problems that are determinant factors of the people's micro and macro environment in a given period. Using a simplistic approach, this process began in the paradise, in the original "two-person society" where the first pair of humans lived in perfect and complete safety, but after taking the apple and being expelled from paradise, they found themselves in the world of uncertainty, and as hundreds, thousands, and millions

of years passed, this uncertainty kept growing and the desire for safety became a dream that is getting more and more unattainable.

From a scientific point of view, we can say that one million years ago there was no man on the Earth, but half of million years ago, our ancestors already appeared, and in the wilderness of Vértés, Samuel, the pre-historic man, together with tens of thousands of other pre-historic humans already banded together and roamed the picturesque lands of the Earth in hordes. In the following centuries and millennia, progress was barely noticeable, but later it gained momentum and instilled an increasing sense of uncertainty into an ever growing number of people, bringing about its objective factors.

The notion of *accelerating time* is a collective bag for all those positive and negative factors that our Mother Earth has to shoulder as an increasing burden: it is doubtful how long she will be able to bear it. The dramatic increase of the human population, the worrisome depletion of the natural resources of the Earth, the widening gap of inequalities are all contributing factors of the security problems in the 21st century and the threats that arise in this context. Also, challenges to security policies in the 21st century arise from the search for the causes of uncertainty, the investigation and exploration of what historical processes led to the current situation, how the phenomenon of uncertainty appeared in various historical eras, how a situation that is markedly different, more critical and dangerous than ever, and more difficult to tackle could have developed by the beginning of the 21st century.

Compared to the previous ones, this present crisis is special, complex, and global. It spans the entire economy and society (social and economic crisis), and affects almost every developed country on the planet. We need to emphasize, however, that crises are not the products of our era – they also occurred in the past history of humanity. Elemér Hankiss discusses this topic in detail in *Magyar Tudomány* (HANKISS, 2013), which serves as a suitable basis for a brief overview. (We must stress that a crisis is particularly important in terms of security, because during a crisis uncertainty increases, a previous stable set of conditions that were thought to be certain cease to exist, and financial and moral anchoring points that represented safety for the people are lost.) An *ontological crisis* essentially means the crisis of human existence – it is its original state in which the eternal and inherent state of the human being manifests itself.

Degeneration theories interpret the history of humanity as a constant process of decline that leads from a former “golden age” to an “iron age” that represents the final state. In the modern era, especially in the 20th century, these theories gained special emphasis and significance. Scientific progress and results achieved in healthcare, and the advancements in science are recognized, but special emphasis is given to collateral (or resulting) detrimental, dangerous and destructive effects. (It is described quite aptly in a report entitled *Microelectronics and Society – For Better or for Worse* of the Club of Rome in which they examine the eternal problem that every scientific achievement has its dangers, especially if it is in the wrong hands. One of the most startling result of the biological revolution of our days, the ability to clone a living organism is maybe the most striking example of this danger. Dolly, the cloned sheep, became world famous. There is no doubt, in terms of the wholesome development of the human race, extending this technology to humans would entail unpredictable risks.) The sense of decline is particularly strong in the developed countries, which contrasts with the healthy dynamism of the developing countries and their efforts to progress.

In the *historians'* interpretation, human civilization moves in a circle, and a peculiar *civilization lifecycle*, not unlike the life cycle of the fauna or of certain technical phenomena and consumer goods, can be observed. Once a civilization is established, an (exponentially) accelerating development begins, which later transforms into a parabolic curve that reaches a maximum point after the rate of growth gradually slows down, followed by a period of decline and extinction. In this way, civilizations either go extinct or they are transformed (or merged) into a new civilization. There is a prevailing view based on this approach that the developed countries (the rich North) have already passed the apex of their development, and now a process of decline has started. In terms of our research objective, it is an interesting view because security risks are particularly increased for a declining security (or continent), and pessimism and the lack of faith in the future amplify the sense of danger and the probability that the objective factors of security risks will emerge. Even this fact in itself represents a security risk!

Scientists and researchers subscribing to the notion of *axial (pivotal) age* do not expect the development of mankind to follow a course of constant progress or decline; rather, they place emphasis on the *great breakpoints* of the history of humanity. That is how Karl Jaspers (HANKISS, 2013) describes the period between 800 BC and 200 BC, which was characterized by a great transformation and a struggle between ancient civilizations that were either based on contemporary magical world views or on monotheism, with an emphasis on the central role of rationality and men. There are many scientists who believe that the profound social, cultural, and mental transition between the conventional Western civilization and the modern age that began with the renaissance was a similar axial age. (Many of them call that period “*second axial age*”). Due to the accelerated progress, the past 40 to 50 years saw processes that brought about qualitative changes – the transition of the modern age into the postmodern era can be *regarded as a third axial age*.

Social and economic changes in the era commencing from the middle of the 20th century also indicate that we are witnesses or suffering victims of a qualitative leap or a revolutionary change. A new world is being born, but the old one is still present, and “floating” between the two evokes a sense of uncertainty in the people: thus, we are fully justified in calling this age the “*age of uncertainty*”. In the 1990s, the sense of uncertainty became stronger in the economic, social, and ontological sphere: researchers and experts of this age are writing about societies at risk, societies, dominated by uncertainty and surprise, that are becoming chaotic, the crisis of global capitalism, and the global jungle. A lot of researchers and philosophers contemplate the spiritual crisis of the 20th century as a typical phenomenon of a historical transition and qualitative leap, they ponder about the crisis of human existence, and regard the century as an era of shattered faiths and withered traditions, describe it as a living dead modern materialist civilization, and they talk about the eclipse and crisis of reason, the fairy-tale of happiness, and the one-dimensional man.

The people’s sense of uncertainty is amplified by the fact that new and old *behaviour patterns* often change their meaning too. New views, new categories appear that are strange for the men of yesterday, and truths and moral standards once thought eternal either change or perish. For example:

- “waste not, want not” was replaced by “consume as much as you can”,
- the moral command “be modest” is replaced by the expectation “be successful”,

- instead of supporting your fellows, in the spirit of competition you need to defeat them,
- the commandment “Thou shalt love thy neighbour” is overruled by the principle “love yourself”,
- instead of obedience, you are expected to get rid of obligations and secure your freedom.

All these considerations are extremely important in terms of our research objective – the interpretation, analysis, and prediction of security – because it is the lonely human who, by projecting his or her internal uncertainty, becomes a precursor of a detrimental situation or process as this projection determines the boundaries within which the objective phenomena of the outside world is interpreted (which means that the importance of even the most harmless minor external uncertainty events will be overinflated, and singular events will lead to far-fetched generalization).

The *dissolution of the sphere of symbolism that surrounds human communities* has similar specific consequences in practice, which represent defencelessness, hopelessness, and uncertainty for the person in question. During the course of history, humans not only surrounded themselves with physical barriers, they were protected not only by forts, city walls, weapons, armies, and organized institutions, but also by a certain kind of spiritual bubble we can commonly call civilization (religion, myths, legends, science, arts, etc.). *All these factors – the physical and the civilization bubble – together provide mankind with a sense of tranquillity and safety and faith in the future, which give the assurance of a predictable and quite life.*

The circumstances, however, are prone to change over time: they change, they are transformed, or new circumstances arise. Changes in the physical conditions are easier to follow and are not so “damaging” to the personality than a change in the civilization that would render people uncertain and vulnerable, causing them to lose their grip, their faith in the future, and the meaning of their lives, and making them lonely. The quicker the changes are, the less time it takes for the changes in civilization to affect the people, the stronger this effect will be. The fact that accelerating time sweeps away everything old and builds up new and unknown phenomena should be emphasized again in this context, and it supports our initial hypothesis that exponential changes are the root cause of the many problems of this age, including, in particular, uncertainty.

The millennium is seen as a period of revolutionary changes, and this description obviously applies to the human communities, the society and the economy too. We are witnessing new phenomena of which we did not have any idea at all. One of these new phenomena is *globalization*. In the past, which means 50 to 60 years ago, the social net was represented by – living and transparent – communities like family, friends, and place of work, the boundaries of which were pushed to the country’s borders: moving beyond that was considered an extraordinary experience (on the occasion of a tourist trip or studying abroad for any length of time). *The transparent, closed and protective small communities provided a sense of tranquillity and safety, the rules of coexistence that were adopted minimized the emergence of abnormal phenomena within a settlement or a community, and the sense of security was inherent under these circumstances.*

The world that was opened up by the change of the political system expelled people from the well-known and secure communities, the air became thin and the community-oriented men ran out of oxygen. The new spirit of globality and its moral and behavioural patterns are almost incomprehensible for people today. Old truths have lost their values, and new questions that have no answers yet arise. Strangely, the modern world, the cold rationality plays a role in augmenting the sense of uncertainty. *With their legends, myths, and magical worlds, civilizations in the past ages encased humans in a soft and warm protective bubble inside which they felt safe and secure.*

Strangely, *scientific revolution* has the same peculiar effect on the people's sense of security. The world that made the old civilizations colourful and warm, the sky that hid wonderful secrets, the stars and the universe are becoming more and more rationally intelligible and lose their secrets, thanks to the scientific advances; the enigma, the appeal of the mystery vanishes, and phenomena that used to carry a mystical substance become empty and meaningless. The list of processes, resulting from scientific advances and progress, that have a special and surprising effect on people's lives and personalities and their loss of certainty would be a long one, however, what we have already said is sufficient to prove in a convincing manner that the uncertainty of our age is not just an economic, political, and social phenomenon, but rather it is also a civilization crisis of the developed countries and a crisis of human existence. If millions of people lose their faith, if the past loses its value to them, if they have no hopes for their future, then a sea of uncertainty may arise with a significant impact on our sense of security, creating a false and unrealistic view of the objective processes that are experienced in these areas.

Among the revolutionary changes of the millennium, we absolutely have to mention the global changes that affect profoundly the people's sense of safety/security/uncertainty, and the transformation of the macro environment that used to convey a sense of stability, relaxation, and safety. Elemér Hankiss (2013) sorted the views about a few important areas of our lives at the end of the 20th century and at the beginning of the 21st century into the following pairs:

- Is there a world chaos instead of a world order?
- Are we witnessing the foundation of new empires instead of an American empire?
- Do we get *Bellum Americanum* instead of *Pax Americana*?
- Global instability instead of global stability?
- Decline of the West instead of dominance of the West, and the establishment of a multi-centered world?
- Global conflicts instead of global peace?
- Spread of terrorism instead of security?
- Economic crisis instead of economic growth?
- Unsustainable development instead of unlimited development?
- Seven years of famine instead of the age of affluence?
- Developed countries fencing themselves in instead of a free world?
- Functional disorders of democracy instead of its triumph?
- Emergence of neo-nationalism instead of internationality?
- Fundamentalism gaining momentum instead of tolerance?
- A world of injustice instead of a more equitable one?
- Rise or decline of solidarity instead of an uncaring world?
- Rebellion of the poor instead of silence of the poor?

The above set of problems are only a part of the phenomena representing and amplifying uncertainty that people in the 21st century are facing, and that cannot be answered in the old way. Getting lost in the jungle of the new world is understandable and so is the fact that millions of people come to desperate straits, lose their sense of security, and become vulnerable.

In the light of the the above, it can be said that the 21st century is probably the most complicated age of human history producing fundamental changes, and this obviously has a negative effect on the micro and macro factors of security as well as on the of the people's increasing sense of uncertainty. The driving force behind this phenomenon is the exponentially accelerating time the characteristics of which we will review in the next chapter.

Accelerating time

Based on the objective and spirit of our research, we will examine the phenomenon of accelerating time from the point of view of security. We are looking for an answer to the question of what effect the accelerating rate of progress in this age produces at the different levels of security and how it affects the people's quality of life.

Our initial hypothesis is that, just like the physical interpretation of speed, accelerated transition in the society, economy and politics increases uncertainty, tension, anxiety, and the sense of danger. For example, the driver and the passengers in a car travelling at 80 to 100 kilometres per hour on the highway can have a relaxed conversation, it is easy to monitor the traffic, there is enough time to avoid dangers that may abruptly arise, and the car can be stopped in a short distance if necessary. At a speed of 150 to 160 kilometres per hour, however, the situation of the driver and the passengers becomes more complicated, intense concentration is required, and sharp turns and frequent overtakes pose a potential danger. The driver will grow tired and anxious in a short time, which is an additional source of danger.

To the above two sketchy examples, we absolutely need to *add two more factors* the social and economic analogy of which is quite easy to recognize.

- *First:* traffic conditions, road quality, weather, and intensity of traffic are key considerations. In clear weather on a multi-lane highway under favourable traffic conditions with a visibility range of several hundreds of metres even travelling at a speed of 130 kilometres per hour will not cause any problems, while in rainy, foggy weather with a visibility range of 30 to 50 metres, driving on a simple road at a speed of 60 to 70 kilometres per hour may be very dangerous.
- *Second:* the condition and quality of the car we are travelling in, whether or not our headlights and fog-lights are strong enough and the brakes are in order, and the condition of the tyres are not negligible factors either.

Down the road of the extremely long history of humanity spanning about ten thousand years, travel conditions were extremely varied: in the beginning the world seemed to be standing still and – with an analogy borrowed from physics – humanity's cart only “advanced” a few metres a year. In our early history, the progress of humanity is described with so-called *geological time spans*, each spanning thousands of years between the key events.

A significant change occurred when ten thousand years ago mankind began to cultivate land and grow plants, and in the river valleys a civilization of city dwellers was created. The *revolution of agriculture* was the first qualitative, revolutionary change in the history of mankind, and subsequent changes can be measured and interpreted by *historical time spans*.

Much later, about two or three hundred years ago, came the second huge revolutionary change in the progress of mankind: the *industrial revolution*. The accelerating changes affect all facets of human life, including the economy, the society and the environment, with a lot of positive and negative consequences. Just like a river, the flow of history also carries flotsam that may either help or hinder humanity's development and progress. Let us examine a few fitting examples to describe the above phenomenon

German astronomer Henry Siedeintopf compressed the major events of 170 million years of Earth's history into a single calendar year, and distributed the major milestones to proportionally shorter time frames (month, week, day, hour, minute, second). The "model year" he developed in this way is widely used for presenting the acceleration of change due to its easy-to-grasp character (LÁNG, 2003).

Timetable of the key events based on the above model:

- January – fauna appears on the Earth,
- March – the first species of insects appear,
- July – the first giant reptiles appear,
- September – dinosaurs go extinct,
- October – the evolution of mammals begins,
- Week 2 of November – primates appear,
- December 30 – *homo erectus* appears,
- December 31, 20:00 – Neanderthals go extinct,
- December 31, 23:30 – Mankind invents agriculture,
- December 31, 23:59:30 – Industrial revolution,
- December 31, 23:59:48 – Car and airplane are invented.

In the geological calendar year, realizing how time units shrink by leaps and bounds is as startling as recognizing the fact that a period of 10,000 years starting with the appearance of agriculture takes place in the last 30 minutes of the model year, while the industrial revolution in its last 30 seconds, and everything that we consider the achievements of the scientific revolution lasts only 12 seconds: the advances of spaceflight, information technology, and the biological revolution (and we could go on citing the achievements of the end of the 20th century and the beginning of the 21st century). In light of the above, we should not be surprised that the passengers of Spaceship Earth are observing with uncertainty and desperation this accelerated speed that is nearly unfathomable for the ordinary human mind, they lose their former sense of security, and they feel exposed and vulnerable.

Table 1, which is based on the lectures and works of the brilliant physicist György Marx (MARX, 2005) shows the acceleration of time and the exponential curve of the course of human history with a peculiar approach. With this table, we will compare three historical periods: ancient history, modern history, and late modern period in terms of time, matter, human model as well as science and arts.

Table 1

Comparison of main historical periods to illustrate the acceleration of time

Time period Factors	Ancient history	Modern history	Late modern period
Time	Changes are noticeable after several generations	Changes are noticeable in a single generation	Changes are noticeable during the lifetime of a single generation
Material	Marble, gold	Steel, coal	Electron, light
Human model	Statue	Steam engine	Computer
Science, arts	Sculpture, architecture, statics, geometry	Baroque style, sciences focusing on motion and future (dynamics, evolution)	Modern natural sciences, informatics, high-end technology

Source: Author's own compilation, based on MARX (2005)

Time was almost standing still in ancient history, the progress of humanity's historical cart was unnoticeable for the people, and awareness of the future was still in its infancy. No traces of progress or change can be observed, it takes a period spanning several generations to notice something, and ten, twenty or fifty generations have to pass before something noteworthy occurs. There is no future, only the present, and for people, especially rulers, achieving immortality is the ultimate goal.

This attitude towards life is expressed by the spiritual, artistic and scientific perception of the era. The material of this period is marble and gold that signify eternity, timelessness and wealth. The human model is the statue, which, as a world model, proclaims the immortality of the great men of the era for all eternity. Even the initial achievements of science are linked to this philosophy. Beyond sculptures expressing the immutability in this age, the development of these disciplines are driven by the need for architecture, statics, and geometry required for building huge monuments, pyramids, and palaces.

The people's security and sense of security can be regarded as stable in this age. Moral commandments set in stone, a very effective family education, the unquestionable authority of the father, the head of the family, created order and tranquillity. For thousands of years, this culture proved to be successful and productive – we call it Mediterranean culture.

In the modern age, after a leap of several thousands of years, we experience a different situation: the era of tranquillity and slow but reassuring progress is over, and we entered a new section of the great road of history, with the traffic becoming more dense, faster-paced and more dangerous. This period is the age of great discoveries and the industrial revolution – with the discovery of the New World, a process of global trade began, and thanks to the technical-scientific revolution, there was a sudden leap in the number of new products appearing, the product life cycles became shorter, technical-scientific innovation reached an unprecedented level, and the pace of change accelerated so much that it became *noticeable during the change from one generation to the next*. The materials of this age are steel and coal, which indicates the energetic growth of industrial production: giant factories were

built, mines were opened – it became evident that after the agricultural revolution, a new phenomenon, the industrial revolution ruled the scene.

The driving force behind this unprecedented dynamism was the invention of the steam engine, which created motion from burning fuel, revolutionized productivity, and made an impact on all walks of life. The steamship and the steam locomotive opened up a new dimension of transport, and steam engines used in production allowed for resolving tasks that were previously considered unfathomable using human labour. Modern history is an era of motion and dynamism. This was reflected by science and arts. Disciplines studying the future (Newton, Darwin), the baroque style, music, and arts (Shakespeare, Monteverdi) appeared. In this world full of change, the role of the family was also transformed: it was no longer able to respond to the various new demands, so schools and teachers were introduced, and the Mediterranean culture that was typical of ancient history was replaced by the Atlantic culture.

From the point of view of security, modern history created a new situation where uncertainty experienced by the people increased compared to the previous time periods, factors threatening security intensified in every segment, from the personal (subjective) level of the individual to the macro level of politics and society, and ever greater efforts had to be made to ensure the security of existing assets, personal wealth, and people.

The late modern period, the end of the 20th century and the first part of the 21st century, shows a previously unimaginable rate of change, marked by qualitative leaps and revolutionary changes. The digital revolution created a new and unforeseen situation in manufacturing, economy, and society, and in the lives of the individual people. The biological revolution produces newer and newer results (sometimes bordering science-fiction) of which the creation of the human genome map and the cloning of living organism are maybe the most known and most perplexing. Thanks to the exploration of space, space travel has become reality today: the space shuttle that will take anyone to space as a space tourist for 100,000 dollars is ready to launch. Construction of space stations capable of supporting human life in space and an energy platform that collects solar energy in space and beams it down to Earth, etc. are encouraging developments.

Today the accelerate pace of change is noticeable even for individuals: single men may experience the birth of new achievements multiple times during their lives, and events that used to take place during a period of centuries may occur as frequently as every 5 or 10 years. The statement of György Marx that today people experience more changes during their lives than one hundred subsequent generations in the ancient Mesopotamia is both spot-on and graphic. The materials of the era are the electron and the light, and it is not the mass that determines the value of a product, but rather its information value, the measure of how smart it is. In the world of micro and nano chips, material dimensions are almost undetectable: we can carry with us a library of information on a single board or chip.

The digital revolution is driven by the computer, which is the human model of the modern man, and the element of today's Generation Y, Z, and Alpha. In this context, the modern natural sciences, information technology and high-end technology represent the scientific spirit of the period. This age goes beyond the Atlantic culture, and the role of family and school is completely redefined: many experts call it the *Pacific culture*.

An integral part of the above large-scale overview is a similar description of social and economic formations: the two methods creates a complete introduction to the complex acceleration of the human history.

Table 2
Economic and political centres of the key historical periods

Period	Economic and political centres	Social base	Preferred capital investment
Middle ages	agricultural estate	agriculture based society	investment into agriculture
Modern history	industrial centres	industry based society	industrial investment
Late modern history	knowledge centre	knowledge based society	knowledge oriented investment

Source: The author's own contribution

In *the middle ages* the centre of economy and politics was *the agricultural estate*, and, as a result, the majority of the population (80 to 90%) worked in agricultural production: we can describe the society as *agricultural society*, and naturally the preferred form of investment was agricultural investment. This age belongs to the development stage of humanity where the rate of progress was still rather subdued (in reference to our discussion relating to the above table: changes took several generations to become noticeable), and consequently the time factor, the sense of uncertainty resulting from the acceleration of time did not have a significant impact on the people's sense of security. Of course, there were other factors: the extremely poor conditions of living, physical labour that shortened the people's lives, and the low standards of science, culture and medicine. In summary: ensuring the minimum conditions of physical existence greatly contributed to the sense of uncertainty (and exposure) felt by the men of that era. Although low-key in their scope, magnitude, and effects, security risks appearing at macro and political level were present and they contributed to the uncertainty of people attributable to such sources.

For people at the lower tiers of the feudal pyramid, the authoritarian and totalitarian system that was a product of the feudal society meant dependency and helplessness, a certain kind of dictatorial order that was backed by the merciless power's almost limitless room to manoeuvre. This situation was special in terms of the safety of people, their families and property, because, on the one hand, they were completely in the power of their feudal overlords (e.g. the right of first night, taxes, corvée, etc.), on the other hand, however, acts that are today subject to criminal laws were greatly reduced. (This phenomenon is not only typical of the feudal period hundreds of years ago, but it is still present today in all those countries that are governed by a central power in the form of a dictatorship. For example, such a country was Hungary before the change of the political system where, as a by-product of the rule by fear, lovers took a stroll in peace on Margaret Island or on Gellért Hill, and a young girl could go home at night without being afraid of any atrocity. It is a peculiar situation that clearly exemplifies the colourful nature of our world and the difficulty of making a judgment.)

The new time period that came after the feudal society was the *age of industrial revolution*, an early precursor of an accelerating world. The invention of the steam engine, the creation of factories, the opening of coal and ore mines, the acceleration of transport thanks to steamships and steam locomotives, and the start of industrial production entailed increasing demand for labour, and the migration of workforce from agriculture to industry began, and soon about 50 to 60% of the population worked in the industry. It was the beginning of the *industrial society*, which is incomparably more heterogeneous, dynamic, and powerful than the previous agrarian society. This age affected the people's sense of safety and security more deeply, earning one's livelihood became harder, the uncertainty of employment and existence became increasingly prevalent, and due to the nature of capitalist production, a number of former moral boundaries were demolished, respect for other people's property and life was weakened, and so was the power of moral, ethical and religious commandments. Gangsterism was spreading, underworld powers acquired several economic and political positions, cigarette, alcohol, and later, drug smuggling grew into a huge industry.

Wars and skirmishes of the feudal age also spread both vertically and horizontally in the modern industrial age, and became larger, and due to advances in technology and science that gained momentum as a result of the industrial revolution, "advanced" weaponry that became more devastating and dangerous, and threatened masses of people was created. Swords and rifles were replaced by machine guns, long-range artillery, tanks, and later, by bombs and aircraft. World War I can be regarded as a scarily representative example of this process. Due to the nature of industrial capital and its unstoppable drive for profit, the threat of aggression and military conflicts increased, and at political, military and macro level, social and political security clearly diminished, and directly and indirectly it affected the people's daily lives.

It can be established without doubt that the industrial revolution and the creation of the industrial society brought about new and worrisome phenomena in local and global security that were the omens of the security risks that plague our modern world and the upcoming decades.

In our days, in late modern history, we are witnessing a completely new kind of qualitative leap: a knowledge based society was formed, and the role of industrial centres were replaced by knowledge centres – the scientific and, as part of it, the digital revolution created an entirely new set of values. In addition to their positive values, unprecedented scientific achievements also create risks that threaten social, economic and human security, and even the security of the human race and the Earth. (We will come back to that topic when we discuss world models.)

The nature, character, and shocking effects of the accelerating time are indicated by data related to *changes of the population of the Earth* that we present in the below table containing statistical data. In order to better demonstrate the dynamism of the process, I focused on the doubling time.

Table 3
Predicted and past population of the Earth

Time	Population (million)	Doubling time (year)
10,000 BC	5	
7000 BC	10	3000
4500 BC	20	2500
2500 BC	40	2000
1000 BC	80	1500
0	140	1000
900	320	900
1750	660	850
1850	1200	100
1950	2500	100
1988	5120	38
2000	6000	
2011	7000	
2016	7500	
2085	10,200	

Source: Author's own compilation based on statistical data and accounts

A large-scale overview of the changes of global population clearly shows the accelerating rate of growth, the exponential acceleration which, considering that man is the only dominant intelligent terrestrial species, affects almost every factor that determines life on Earth, and all those problematic areas that are the critical in terms of humanity's future. From the growth of population, effects impacting on the complex aspects of security can be directly derived. In the first broad-strokes discussion within this chapter, that I will elaborate on in the part about world models, I refer to certain security-related unfavourable signs resulting from the fact that the *living space on Earth is becoming overcrowded*.

About half a million years ago, in the early stage of our development, groups and hordes of pre-historic men, including Samuel, who was found in Vértés, roamed the Earth: their numbers were estimated at ten to fifty thousand. Based on estimations, in this early age, it took *100,000* years for the population to double.

The first revolutionary change was marked by the emergence of agriculture when the *previous excessively long doubling time was reduced to one thousand years* – one tenth of what it was. Obviously it was still a very long time, but overpopulation issues did not exist then, the question of Earth's capability to sustain life did not arise, and ecological footprint was an unknown category.

The second revolutionary change occurred during the industrial revolution, when doubling time was further reduced to tenth of the previous one thousand years – one hundred years – between 1750 and 1850 (its value was the same between 1850 and 1950). The alarm was already rung then: there was more and more talk about Earth's capability

to sustain life and its future, various theories and ideologies arose about the “usefulness” of epidemics and wars, claiming that their purpose is to curb rapid population growth (e.g. the theory of Thomas Malthus).

The growth rate of the population kept increasing, and while it was 2.5 billion in 1950, it was doubled by 1988, taking only 38 years to rise to exceed 5 billion. By the end of the century and the millennium, there were 6 billion, by 2011 7 billion, while in our days 7.5 billion people living on Earth. These data reveal that doubling time is increasing – apparently, the curve reached its minimum in 1988 and now, after a local minimum, a slow increase will follow. Based on this curve, doubling of the population of 5 billion is expected in 80 to 90 years. There are heated debates about the limits of Earth’s capability to sustain life: the estimates range between 6 billion and 200 billion.

The main problem, however, is not the absolute value of population numbers, but rather the heterogeneity behind those numbers. The opinion of researchers, scientists, and professionals are unanimous: as long as the differences between the rich North and the poor South, and the troubling gap between the rich and the poor are not mitigated, the risk to Earth and its global security will continue to increase, affecting the citizens of the regions and the individual countries.

Unfortunately, we cannot even claim that the situation stagnates: on the contrary, it deteriorates even further, and an ever increasing percentage of the world’s population live in poverty, lacking the ability to meet even their minimum needs. Poverty, lack of education, religious fanaticism, and economic pressure are breeding grounds for crime and terrorism as these people have nothing to lose. *In terms of security, these are basic inevitable questions.*

World models and security related deductions that can be made from them

The above outlined favourable and unfavourable signs of the accelerating time were strongly felt in the middle of the last century when it became evident that the economy and society of Earth and the use of natural resources took a new course that could potentially lead to a disastrous outcome. The “civilization juggernaut”, the goal of which is to encourage people to consume as much as they can and the creation of mass production capacities that can satisfy the demand, has already been set in motion.

In the three basic subsystems of the earthly existence – in the workings of nature (the created world), economy (eco- and technosphere, the artificial world) and society – the disruption of the harmonious order is already noticeable.

Before the beginning of the 20th century, these three subsystems were interlinked without any major issues, and the “cogwheels” of the subsystems transferred their kinetic energy smoothly, and as a result there were no worrisome disturbances in the operation of the terrestrial system itself. By the middle of the 20th century, however, this situation changed for the worse, the economy came out on top and subdued the other two subsystems: economic (business and profit) goals became dominant. These clearly economic and business objectives led to the unscrupulous plundering of the valuable resources that nature amassed in millions of years, endangering the basic environmental conditions of life on the earth. In this process, humans were turned into biological robots, and the essential human,

emotional and economic conditions of human life were brushed aside. Human life is becoming uncertain, unpredictable and futureless, and the risk of desperation and irrationality in the way people act is increasing. *This sends an important message in the field of the safety policies of the 21st century to the people working on establishing the conditions of security.*

The above outlined detrimental process reached dramatic levels by the beginning of the 21st century, and escalated into a global economic and social crisis. The future of humanity is started to receive attention and became the focus of studies and scientific research, which culminated in the foundation of the Club of Rome in 1968, and in the publication of world models under the auspices of the Club of Rome in the following decade.

The formation of the Club of Rome was the first warning sign to people, leaders, and government officials, and the first instance of raising awareness that we are proceeding in the wrong direction and if we do not change course, it could lead to the destruction of mankind. This call appeals to human rationality and the instinct of self-preservation, and highlights the necessity for man to act responsibly. Human thinking and mentality must change, and the current path which is fraught with dangers as we have already noted should be abandoned for a better one. It is unfortunate that these necessities avoid the limelight and people tend to behave in the face of danger in a way that was described as the “problem of the 29th day”. (The problem in nutshell: let us assume that on a lake plants that endanger the water surface appear, and their numbers double every day so in thirty days they will completely cover and suffocate the lake. In the first days the danger is barely noticeable, but after ten to fifteen days the serious threat is apparent, and it becomes clear that something has to be done to save the lake. However, due to their indifference, humans refuse to acknowledge the threat even after 20 to 25 days, when the situation becomes dramatic and, for all intents and purposes, the lake can no longer be used. Then we reach the 29th day and only one day is left to save the lake, but this uncertain rescue effort will cost a fortune. If a decision had been around the tenth day when the outcome was already clear, the lake could have been saved easily and at a relatively low cost. Unfortunately, they failed to act, but deliberately waited with an almost “suicidal” intent until the last and most uncertain stage.

For this reason, the scientists who established the Club of Rome decided to use the power of science to alert people to the fact that killer weed was already proliferating on the lake of our lives, and we need to take notice of them and act before it was too late. The *first world model* of the Club of Rome entitled *The Limits to Growth* (MEADOWS, 1972) was completed in 1972.

The computer model based on system dynamics essentially used the principles of *physical determinism* to build on statistical data from the past seventy years in order to extrapolate trends in the middle or at the end of the 21st century from those of the former period. Basically it sought to give an answer to the question of what would happen in one hundred years if the key processes (population, industrialization, food production, environmental pollution and depletion of natural resources) continued as we observed them in the past century. They developed 12 model versions, and using them they came to the conclusion that between 2020 and 2090 we will reach a critical point, the final limit of growth, imposed, by, among other things, the depletion of natural resources, environmental pollution reaching critical levels, lack of additional land areas for agriculture, and the emerging food shortage.

Based on the *wind-up world machine* analogy (which is a direct result of physical determinism), the authors of the model suggest that, similar to a real wind-up car, the spring

should not be wound any further, rather we should let the car roll until the spring unwinds completely. Thus, we need to reduce the rate of growth – putting the *zero-growth theory* to use in practice would be beneficial. (Obviously, developing countries protest vehemently against this approach as a 0 percent growth would conserve the current inequality between the rich and the poor. It is not a coincidence that at a conference in Rio de Janeiro, the developing countries decided to develop the *Bariloche model*, which, considering its methodology, also builds on system dynamics, but its database contains data relevant to developing countries.)

The Meadows world model stirred intense debates around the world – its obvious flaw is its philosophy that simplifies the trends in the world as a form of physical motion and assumes a homogeneous world (for example, they included a single birth rate in the model that is used to characterize global fertility in the given years). It is clear that there is a difference in the order of magnitude between the developed and the developing countries in that regard. The average value does not tell us much about populations that are heterogeneous and have a high variance intensity. The computer model is obviously based on mathematical formalism, which gives rise to the problem not unlike the above mentioned issue: the phenomena of the world are correlated in a stochastic rather than deterministic way, which precludes a description with scientific clarity.

The *second-generation world model* of the Club of Rome was authored by Eduard Pestel and Mihailo Mesarovic, and it is entitled *Mankind at the Turning Point* (MESAROVIC–PESTEL, 1974). In its approach and methodology, this model represents a step forward compared to the first world model as its basic philosophy is not physical but *biological determinism*, which is suitable for describing complicated processes, for example, how the seed grows into a flower, how a planted seedling becomes a fruit bearing tree and so on.

It is essentially a *computer model of organic growth* that is based on the following principle: nature, including the world system, moves along a path of growth, which can be described with a special logistical function and which is characterized by growth starting at high intensity from an initial low level and following a curve that can be described in this stage with an exponential function. However, as it reaches a certain level, a *turning or inflection point*, the growth rate is gradually reduced until it reaches the third and last part of the curve where a slow rate of growth or stagnation sets in. (Here the exponential function transitions into a logistical function.) The builders of this model believe that humanity is at this inflection point now, and depending on the decisions made in this period, it will either change course leading to global organic growth, or continue to rush forward at the current increasing rate.

Another step forward is the way the model handles world processes that the first model regarded as homogeneous: in accordance with the real nature of phenomena, it considers them *heterogeneous*, thereby distinguishing between the parameters of the individual regions. The model simulates economic, social and natural processes in ten regions, and determines the key indicators for each of these regions. The theses and conclusions of the model have been confirmed by the reality, and presumably they will also be applicable to the 21st century.

The hypothesis that the world can only be interpreted as a combined system of several region is essential. This statement is applicable to the entire economy and society, and we are justified in treating it as a basic rule for the 22nd century. An interpretation and study

of the phenomenon of security cannot ignore this hypothesis, in particular, because in *our days even local security has a global interpretation attached to it*. (It is enough to consider the specific criminal trends of each continent and their intercontinental influence, for example, in the case of the globalization of terrorist activities carried out by the Islamic State and other organizations.)

From the regional approach of the world model follows the conclusion that, contrary to the global collapse forecast by the Meadows model, it predicts probable regional crises in the next century. Reality confirmed this prediction as “bush fires”, regional wars and crises breaking out in various parts of the world did not spread over to the other parts of the world and did not escalate to global level (for example, the Yugoslavian or Iraqi crisis, or the crises that broke out in several African and Asian countries).

An important conclusion of the model is that without a concerted global effort it is not possible to overcome regional crises. It is reasonable to extrapolate these theses and the conclusion of the model to the prediction made in regard to the security of the 21st century. Regional crises inevitably produce a number of negative phenomena that reduce the security of states and people, increase the sense of uncertainty, and trigger detrimental processes. Therefore we cannot be optimistic in that regard as relief and security will be replaced by a sense and the fact of uncertainty and unease in the following decades.

Out of the world models of the Club of Rome, we need to highlight two additional reports, *a common feature of which is that they are not mathematical but verbal models*, and the final conclusions of both can be easily applied to predicting the expected trends of security policies in the 21st century. In 1997, a report of the Club of Rome entitled *Reshaping the International Order – RIO* (Tinberger, 1976) was produced under the direction of Nobel-prize winner Dutch economist Jan Tinbergen. The model reviewed key subjects, such as armament, population growth, food and water supply, structure of settlements, pollution, natural resources, space, international institutions and the system of interdependency. Another world model, also dated 1977, was authored by a research team headed by Erin László, and entitled *Goals for Mankind* (László, 1977). *The final conclusion of both world models deals with the greatest problem of our era: how to secure our future. According to these reports, the future of humanity depends on eliminating inequality, and the international order must be reorganized to that end.*

Reports issued by the Club of Rome later addressed major secondary subjects instead of complex global issues:

- *Energy, the Countdown* (MONTBRIAL, 1978).
- *No limits to Learning* (BOTKIN et al., 1979).
- *Dialogue on Wealth and Welfare* (GIARINI, 1980).
- *Road to the Future: Towards More Effective Societies* (HAWRYLYSHYN, 1980).
- *Microelectronics and Society: For Better or Worse* (SCHAFT–FRIEDRICHS, 1980).

The novelty and efficiency of world models lie in the fact that through quantitative and qualitative analysis they attempted to examine our world’s economic, social and environmental issues in a realistic framework of correlations, striving to explore, measure, and analyze the relations and effects of the individual factors.

It is a regrettable fact, however, that problems revealed by the world models and reports of the Club of Rome were not resolved during the past period of almost fifty years, and in

several areas the tensions have further increased. The above statement is backed by the report of the *non-profit international organization OXFAM*¹, which is released every year at the time of the summit at Davos as a counter-example of the achievements of the world's most developed countries.

The OXFAM reports of 2016 states the following:

- in the past one hundred years, we never experienced inequality comparable to the current level on the earth,
- the wealth of the richest 1% exceeds the combined wealth of all the other people,
- the wealth of 62 richest men on the planet is equal to the wealth of the poorest 3.6 billion people,
- the wealth of the richest 62 people has risen by 44% since 2010, while the wealth of the bottom half fell by 41%,
- since 2000, the poorest countries have received just 1% of the total increase in global wealth, while half of that increase has gone to the top 1%,
- the average annual income of the poorest 10% of people has risen by less than \$3 each year in the past 25 years, which means that their daily income has risen by less than a single cent.
- it is typical that the richest try to hide their wealth (to avoid paying taxes) – the estimated amount is 7,600 billion dollars, which is equal to the annual GDP of Germany and Great-Britain,
- wages continue to decrease compared to returns to capital,
- in the USA productivity rose by 72% between 1972 and 2014, while the salary of the workers grew only by 8.7%,
- the richest pose the greatest threat to the stability of the world: they have tremendous lobbying power, and they can devastate the environment and the society for the sake of profit.

The above statements are startling, and they indicate the omnipotence of economy and profit, and the almost unstoppable increase of their role and weight. The world models, the scientists and progressive forces of the world identified as a basic condition and a goal for humanity the mitigation of inequalities. In contrast, the current situation shows the sharpest, greatest and deepest inequality in the past century. (The example, cited by the president of OXFAM, stating that the 62 richest men who dominate the fate and progress of the world would fit onto a single bus, unlike the suffering billions.)

The inequality or gap between rich and poor that has been increasing for a century is the dominant factor contributing to the deterioration of security – poor, uneducated people who have no other opportunities constitute the active recruitment base of various crime groups, starting from international terrorism through the sphere of politics to violent crimes that plague our daily lives (robbery, theft, breaking and entering, crimes against human life, etc.).

At this time nothing indicates that this process would change for the better in the next decades, there is no sign that the voracious appetite of the capital for ever greater profits

¹ An organization founded in 1942 in Oxford, aiming to fight against, and to raise awareness of poverty and inequality.

would be curbed, and that it would take measures to eliminate inequalities threatening the future of the world. *This, in turn, indicates that in the 21st century a crime prevention and law enforcement strategy that is well suited for the new circumstances should be developed in every country, including Hungary.* An important element of this strategy is the strengthening of the official law enforcement and intelligence organizations in order to ensure that their domestic and international capabilities are boosted according to the prevailing global approach, and their focus should shift towards the risk factors resulting from the ever growing number of impoverished people living in the developing parts of the world.

At the same time, other important factors include encouraging the civilian crime prevention movements of the citizens and exploiting the fact that it is the self-organized communities that are in the best position to recognize the early signs of problems within the communities. *The only country-wide crime-prevention organization in Hungary that fits the above description is the Auxiliary Police (Polgárőrség), the weight, role and importance of which continue to increase.*

Quantitative growth must be necessarily linked to qualitative growth, considering the character of the law enforcement tasks that we are to face in this century, and the widening international cooperation in this field. Civil initiatives, combined with the professional skills of official organizations and agencies, can be an efficient way to act, the viability of which has already been proven.

Today, 80% of the planet's population live in the poorest half of the countries, and their numbers and percentage are increasing. Migration driven by the economic attractiveness of a small number of rich countries can be regarded as an objective and necessary process, the first signs of which are already observable. It is not unreasonable to assume that in the 21st century this process will be further amplified, generating cultural, economic and social problems that are almost impossible to resolve. Many people ask whether or not migration in modern history may become an unstoppable avalanche due to number of people involved if the rich and developed countries fail to take action against the growing inequalities. Beyond a certain point there is no physical barrier that could stop billions of human beings.

In summary, in the light of the trends and phenomena outlined in this study, we can come to the final conclusion that the security policy of the 21st century will be dominated by several new factors that require a new mindset, new answers to new problems, and a reinterpretation of security that makes sense at both macro and micro level.

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