Governing Dynamics in Complex Systems using Big Data Information

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Abstract

God has given us an almost perfect home planet to live on. Since then, man has continuously chosen to spoil and poison it through his actions and overuse of resources. Science should now help to repair damages thus inflicted upon our planet. This paper presents different dynamics of a complex economic system, based on certain assumptions made within each of the presented models. The assumptions used allow estimating and forecasting the evolution of the respective complex economic system. This estimation can be made in the "classical" way, which is to say without the use of big data, in which case the results are more prone to errors or ~~of~~ by collecting big data, which delivers a much more accurate estimation of the evolution of the complex systems. Throughout this paper the term "with sustainable growth" means "ecological growth" and it refers to durable economic systems where the environmental issues are taken into consideration, whereas the term "without sustainable growth" or "conventional growth" refers to the economic systems where the environmental issues are not taken into account.

Keywords: big data, economic systems, exponential growth, S shaped curves, utility, planetary boundaries, planetary resources, population growth, temperature rise, pollution, carbon footprint, renewable energies

1. Introduction

The present paper has a few distinct objectives. One such objective is to stress the present day realities regarding our planet, that has been and continues to be misused. Otherwise it intends to approach the value created within economic systems, taking into account different models: the so called "classical" or "conventional" economic model which has been deemed as valid until very recently, and the economic growth model taking into account sustainability and durability issues., The latter model is absolutely necessary to be used from now on, if the planet and its habitants are to survive. Using the sustainability concept and making the calculations taking into account all the presented costs, one can easily remark that the value generated within the worldwide economy is far lower than the calculated GDP. This should be seriously corrected with all the costs incurred. Based on existing scientific literature regarding environmental and climatic issues, this paper also identifies a series of problems and their possible solutions, through specific instructions , and expanding on a previous paper published by this same author.

2. Assessing utility in complex systems without sustainable growth and without the use of big data

You live in a home; you do not own the home,
You do not even pay rent,
Moreover you vandalize this home…
What should you expect?

The most suitable model to assess the utility of both complex systems with and without sustainable growth is the additive utility model, described and used in [2], [4] and [7]. According to the paper [1], an economic sector of an economy can be found in one of the two regions of the graph of exponential evolution curves. The S shape used for modeling the evolutions within an economy has been chosen from two reasons: most of the processes in the economic evolution are said to be exponential, and according to some of Engel's older theory, many consumption or production curves are S shaped curves, which implies that the production reaches sooner or later its saturation limit (Slide 90 in [3]). One issue addressed and solved by the author is assigning an analytical form of the function to the respective S shape. Both, the shape and the analytical form of the function are to be found in the respective paper. The S shape does not necessarily need to be based on an exponential function, but in the model proposed by the author it is. In this proposed model, A_i is representing the initial production quantity of the i^{th} economic sector and B_j is representing the saturation limit of the production quantity of another j^{th} economic sector.

2.1 Assumptions made within complex systems without sustainable growth and without the use of big data information

These assumptions made within the complex system without sustainable growth are:

a1) the calculation of the utility in the complex system is to be made over many decades

b1) without restricting the generality of the model, since an economic sector can be always split into subsectors and each such subsector can be associated with the production of a certain product, one can assume, for the clarity of the model, without the loss of generality that each sector produces only one product and the value of the product made within this certain sector i, has the average added value Val Ai, whereas the added value of the product in another economic sector j, a sector situated in the saturation region of the exponential growth, has the value Val Bj

c1) another simplifying assumption used within the paper is that the added value Val Ai of the product in the sector i is calculated, under globalization assumption, that is to say it has the same value worldwide (which is more or less the tendency and status toward which the global economy is moving to)

d1) all production functions are assumed to be S shaped. The analytical form of these curves will be extended in the fourth chapter of the present paper, with another concept, namely the concept of acceleration and deceleration (attenuation) factors, which will be described and presented therein

e1) in the time interval over which the utility is calculated, the production quantities A_i and B_i are deemed to be almost constant and the added values of the products and the economic factors, for example Val Ai and Val Bj, are also deemed to have almost constant values over time (which is the stability assumption of the economic prices)

f1) another assumption valid for the theory of complex systems without sustainable growth, which was deemed to be true until recently and is characterizing the conventional economic theory is the assumption that the resources available for growth are infinite and the Earth has an infinite regeneration capacity, an assumption which dated until recently, in the XX century, but is obviously false.

g1) another assumption also valid for the theory of complex systems without sustainable growth, also deemed to be true until recently and which characterizes the conventional economic theory is that the value generated within the national economies is measured by their GDPs, such as presented in [5], an assumption used also until recently, in the XX century, and it is again, obviously false.

$$GDP+IM=C_P+I_P+C_S+I_S+EX \quad (1)$$

GDP = gross domestic product
IM = imports
C_P = private consumption
I_P = private investments
C_S = state's consumption
I_S = state's investments
EX = exports

2.2 Value generated within the complex systems without sustainable growth and without use of big data

Taking into account the above assumptions the value generated within a complex economic system can be calculated, more or less accurately with the same formula that was valid for the first human economy (the ancient agricultural economic system which had only two sectors: planting and farming). This formula for the production (GDP) generated at a certain moment in time (for example in the year t), for a complex economic sector with n sectors, within the exponential growth area and m economic sectors within the exponential growth limitation area, is:

$$GDP = \sum_{i=1}^{n} A_i(e^t - 1) * Val\ A_i + \sum_{j=1}^{m} B_j(1 - e^{-t}) * Val\ B_j \quad (2)$$

One remark to be made about the calculation of the total value of production, without using big data, is that in order to estimate closer to the true value of GDP, the form of the exponential functions in both regions should be determined as exactly as possible. The same formula applies also for calculating the production over a longer period of time, by integrating the formula above, thus resulting the total production's value over the respective period of time.

3. Assessing utility in complex systems without sustainable growth with the use big data

The model generated within this chapter will make use of the larger availablility of big data information in the present day.

3.1 Assumptions to be made within "conventional" complex systems (without sustainable growth) using big data information

The assumptions made within the complex system without sustainable growth and with the use of big data are:

a2) the calculation of the utility in the complex system is to be made over many decades

b2) using big data information one can estimate more accurately the values pertaining to the assumptions b1 and c1 from above, by calculating more precisely the value generated in the complex economic systems, by adding the almost exact values of all economic sectors in the respective economy, thus renouncing the assumption of global economy used above to simplify the model.

c2) all production functions are assumed to be S shaped. Their analytical form will be extended in a later chapter of this paper.
d2) using big data, one can also estimate more exactly the analytic form of the S shaped curves in the model by using permanently updated big data information, which contributes to a much better accuracy of the calculated value within the respective economic system.
e2) another assumption valid for the theory of complex systems without sustainable growth, which was deemed to be true until recently and characterizes the conventional economic theory, is the assumption that the resources available for growth are infinite and Earth has an infinite regeneration capacity, an assumption which dated until recently, in the XX century, but is obviously false.
f2) another valid assumption for the theory of complex systems without sustainable growth is that the value generated within the national economies, according to the conventional economic theory, is measured by their GDPs, although this assumption has been deemed as valid until recently in the XX century, is again, obviously false.

3.2 Value generated within the "conventional" complex system (without sustainable growth) using big data information

Taking into account the above assumptions and using big data information, the value generated within an economic complex system could be calculated much more accurately than in the case without big data information, by adding permanently updated data into the models used. With the help of big data, almost all necessary information for calculating the total value in the respective system, such as: number n of the economic sectors, number m_i of subsectors for each economic sector, the amount of quantity of products within a specific subsector (i,j) is A_{ij},the calculated average value of the product produced in the subsector j of the sector i, has the known value $Val\ A_{ij}$.

In this case, using big data information, the analytic form of the production functions of the economic subsectors do not need to be known anymore, since the calculation is made by aggregating the data available above. Using the information from big data above, the total value created (GDP), calculated based on big data can be calculated, using the formula:

$$GDP = \sum_{i=1}^{n} \sum_{j=1}^{m_i} A_{ij} * Val\ A_{ij} \qquad (3)$$

4. Assessing utility in complex "ecological" systems with sustainable growth and using big data information

To assess utility in complex economic systems with sustainable growth, that is to say, including the environmental component, is far more complex and delicate than in those without. One of the main aspects and difficulties in doing this has been already stressed within [1], and it refers to the fact that quantifying/ monetizing human lives is a very hard thing to do and moreover the concept of money was inexistent in ancient times. Back in the ancient times, when humans moved from a hunter/gatherer economy to an agricultural/farming economy, the positive impact of this move, in terms of human lives saved from starvation or fights with wild animals, is virtually impossible to assess. Nobody can know or even estimate how many human lives have been saved by this primary replacement in the world's economy. The issue with these estimations however, in the present day or in the very near future, has become much more addressable and capable of being solved, using big data. Big data, which is now collected everywhere around us and as it is very well presented in [10], can be used both as a microscope or as a telescope, and hence, based on it one could somehow quantify the value of a human live, one of the most valuable assets. Hence, big data could be used as a microscope in order to make the necessary estimations in the following way:

4.1 Assumptions used in complex systems with sustainable growth using big data information

Assumptions to be made within the complex system with sustainable growth:
a3) the first remark is that some of the assumptions made within the previous conventional economic model will be kept, some are to be renounced, and some new assumptions, regarding sustainable growth and the environmental component will be added.
b3) the assumptions a1, b1, c1 and e1 from the model above are to be kept in the same form as they are presented above.
c3) the obviously false assumption thought to be valid, in the theory of complex systems without sustainable growth, that the resources available for economic growth are infinite and the Earth has an infinite regeneration capacity, is to be replaced with the correct assumption that both the resources and the regeneration capacity of the planet are limited
d3) the other false assumption deemed to be valid in the theory of complex systems without sustainable growth, namely that the value generated within the national economies can be measured by their GDPs, is also to be renounced, and the concept of GDP should be extended and corrected with the concept of the balance of natural resources, as indicated in [11]
e3) taking into account the assumption above, the estimation of diminishing resources should count as a cost in the economy and this cost should be subtracted from the value of the GDP of the respective national economy. One real problem is the evaluation of the loss or gain of natural resources in the balance (either the national or worldwide balance of natural resources, such as natural habitats and ecosystems - plants and animals, but also non-living natural or fossil resources, limited in quantity and used within the complex system). The difficulty refers, on one hand to the

evaluation methods to be used to make the estimations and on the other hand to the measurements which are to be made for the respective evaluations. It is obvious to anyone that the value of a forest, for example, is not equivalent to the value of the wood from the trees growing in that forest. One can say that the most correct evaluations can only be made soon after damages to the natural habitats'. The disaster will be evaluated in terms of the negative impact on our planet. This is also the case for the deaths and damages caused by the Coronavirus pandemic. The costs thus incurred will be perhaps possible to be assessed, retroactively, only after the end of the pandemic.

f3) the model of the complex system with sustainable growth is to be completed with the costs incurred due to the damages risen from the loss of human lives: either deaths due to natural calamities (deathscaused by extreme weather conditions such as fires, floods, drought, storms, hurricanes, a.s.o.); deaths due to polluted air, soils, waters; material damages due to natural calamities caused by climate change; material damages caused by the reduction of agricultural production due to climate change

g3) the estimation of losses in terms of human lives, due to deaths from natural disasters (deathscaused by extreme weather conditions such as fires, floods, storms a.s.o.) is to be made based on the big data numbers recorded and the consecutive calculated costs will be subtracted from the GDPs

h3) the estimation of human deaths due to air, soil, and water pollution such as: lung diseases, cardiovascular diseases, digestive diseases a.s.o, are to be estimated as number or as years lost in the respective human population plus the cost of the medical treatments used for the respective patients affected by the pollution of any kind. There are present day estimations regarding the respective costs which are more or less exact. For example according to [11], the estimate of costs due to environmental issues in the USA is estimated as high as 120 billion USD/year and the same estimate for China is about 5% of its annual GDP. One other estimate is that the number of people dying as a result of air pollution worldwide is about 7 million. If the deaths caused by the other types of pollution are amounted to the same value, then 14 million deaths yearly are caused only by pollution.

i3) another estimation which counts to the costs, but is also rather hard to make, is the estimation of costs due to infant mortality, which incurs consecutive costs to the extended economic balance. Although the number of infant deaths due to environmental pollution could be somehow estimated, the additional costs (for example: traumas of their parents**)** incurred by these deaths are harder to estimate.

j3) another important cost account in the balance of the complex economic system with sustainable growth is represented by the costs of living with children born with serious debilitating illnesses due to the pollution and toxicity on Earth. In this case, a great percentage of the respective persons, not only do they not produce any value, but instead, they are representing costs for the economy, throughout their entire lives.

k3) much of the above estimations are possible to be made nowadays, using big data information which is being used more and more to record data on almost anything. The future expectations are that big data will become more precise and more widespread in the near future, and through using it , many of the estimations to which the above assumptions refer to, can be made

l3) another cost account in the model is represented by people with debilitating handicaps resulting from both natural disasters caused by climate change but also caused by pollution and toxicity.

m3) although the estimation of the cost of a human life is a rather delicate and intricate issue to approach, and there are also other aspects to be taken into consideration in this matter, the costs of lost human lives can however be estimated using the following calculus: the estimation of costs incurred in h2 and k2 and m2 can be made based on big data information as follows. One has to calculate the difference between the average lifespan and the age of death for each of the dead persons; then this number of years is to be transformed into costs by multiplying the value of this difference with the average generated value/ person/year for the people deceased due to extreme weather conditions. One can make this estimation in two different ways: firstly by using the global economy assumption and using the same average generated value for every person on Earth, or secondly, based on big data information, using the much more exact estimated value of the annual average value generated per person for the respective economic system where the natural disaster occurred.

n3) according to some initial information from the World Health Organization (WHO), Coronavirus originated from Asian wild animal farms. This initial assumption has not been fully confirmed for Coronavirus, but is referring to how other similar viruses originated from wild animals. They are the result of humans entering former virgin natural habitats. The costs thus incurred to complex economic systems with sustainable growth are of catastrophic impact and almost impossible to predict, but possible to be estimated ex post.

4.2 Value generated and boundaries within complex systems with sustainable growth using big data information

Taking into account all the assumptions above, the formula for GDP, corrected with the costs incurred in the respective period, based on the following notations, can be calculated with formula (4) below.

A_{ij} is the quantity of products produced within the subsector (i,j)

$Val\ A_{ij}$ is the added value of the product produced within the subsector (i,j)

B_{ij} is the assigned quantity of resources consumed, to the sector (i,j)

$Val\ B_{ij}$ is the value of the resources consumed by the sector (i,j)
D_k are the values of damages due to extreme weather conditions
E_t are the costs related with environmental issues
H_s are the costs of human lives, calculated as indicated in the paper

$$GDP = [\sum_{i=1}^{n}\sum_{j=1}^{m_i} A_{ij} * Val\ A_{ij}] - [[\sum_{i=1}^{n}\sum_{j=1}^{m_i} B_{ij} * Val\ B_{ij}] + \sum_{k=1}^{p} D_k + \sum_{t=1}^{q} E_t + \sum_{s=1}^{r} H_s] \quad (4)$$

4.3 A model to control the limits of consumption and to correct the limits of resources used

The model proposed within this subchapter is another original contribution of this paper. The concept of "saturation limit" has been addressed by the author, in [1], some few years ago, independently from the presentation in [11], where the similar concept of "boundary" is used. While in the book [11] the concept of "boundary" has a general approach and the concept refers only to the idea of limitation of the consumption of resources or to limitation of pollution, temperature rise or carbon dioxide emissions, the concept used by the author, of "saturation limit" refers to the calculation and implementation of the actual limit of the analytical function. This is to be made either with regard to past values of the function or to saturation limits that the evolution of the certain processes should be forced to reach in a certain period of time. In the respective paper [1] it was assumed that the function according to which the evolutions are taking place in the economy are following simple exponential functions, in both regions of the evolution within a certain economic sector: the exponential growth region and the saturation exponential growth region of the curve associated to the respective evolution of the economic sector.

According to data and observations in the rich countries [11], the happiness and wellbeing of people are also obeying the law of saturation. Over a certain value of GDP, the population of the respective country is not happier or more satisfied. So the model in this chapter of the paper could also be applied to reduce consumption and consecutively GDP in wealthy countries, in order to eventually transfer resources to poorer nations, without significant loss of happiness and standard of living in wealthy countries, so that the balance between people on Earth could be restored.

The present paper is taking this concept of saturation limit to the next level. The assumption made within the respective paper of the author was that the exponential growth and limitation curves are increasing in two different regions of the curve: in the first region the growth being exponential and in the second, growing up to a saturation limit - both functions being simple exponential functions of the variable time (t). These assumptions are to be extended, namely by the following:

The disappearance of an economic sector could occur not only when a certain saturation limit is reached, but also when the demand for the goods of the respective sector decreases down to a certain lower saturation limit. This proposed model is completed with the additional fact that the exponential functions do not need to be simple functions of time, but they can be also exponential composite functions.

The assumptions made in [1] are to be extended with the following: to both, the exponential growth area and the saturation area, acceleration factors that will correspond to the actual corrected evolutions of the respective sectors can be added. An exponential decrease with an additional deceleration or attenuation factor (A) of the considered consumption, down to the accepted value of the respective economic sector, should be seriously taken into consideration, in order to reach the sustainability condition which the economy should comply with. Let us set the time interval T_0 in which the value of a certain consumption should decrease from the value M to value S.

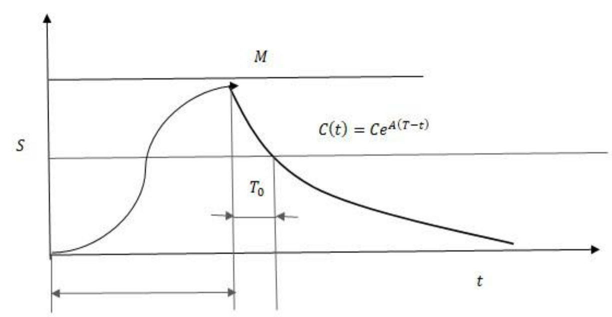

Fig.1

The secondary conditions to determine the analytical form of the function C (t) are:

$Ce^{A(T-t)} = M$, for t=T, and $Ce^{A(T-(T+T_0))} = S$, for t=$(T+T_0)$

From the first one it results: C*1 = M, and using the second one:

$Me^{-AT_0} = S$, meaning: $e^{-AT_0} = \frac{S}{M}$, that is to say: $-AT_0 = \ln\left(\frac{S}{M}\right)$, resulting $A = \frac{\ln\left(\frac{S}{M}\right)}{(-T_0)}$, Hence, the attenuation factor A of the function has the value: $A = \frac{\ln\left(\frac{M}{S}\right)}{T_0}$ and the function has the form:

$$C(t) = Me^{\frac{\ln\left(\frac{M}{S}\right)}{T_0}(T-t)} \qquad (5)$$

Although, theoretically, big data could make the use of the exponential functions unnecessary, this paper shows how the respective developed theory could be useful in controlling evolution and future action. This is going to be done as follows: one can set out the time interval (T_0), available to decrease the present actual consumption level (M) down to a certain lower saturation limit (S). The decrease should also be exponentially accelerated, from the level M down to level S. One can, then calculate the analytical form of the exponential decreasing function and based on this onecan permanently follow and correct the measures to be taken in time, in order to control the respective decreasing consumption process, in the time interval set, T_0. In this way, the process of exponential decrease could be permanently monitored and controlled to avoid deviations from the process.

5. Problems and solutions

"There is enough for anyone's need, but not for everyone's greed"

Mahatma Gandhi

Some actions taken, regarding commerce in capitalist society at the beginning of the XX century, have generated an increase in the population's consumption. The large scale availability of credit, introduction of marketing, publicity, advertisements and fashion, all have led to the exponential growth of consumption and consumerism. The data recorded since the beginning of the 1920s are proof of this. The greed which followed to this consumerism originates exactly in those actions taken at the beginning of the previous century. This greed associated with consumerism should be abandoned and replaced more and more by the values of a minimalist way of living. Since those consumption habits are already deeply embedded in the genetic code of consumers who make up the wealthy nations' population, the measures to be taken should be very harsh. One easy and logical solution is to make more people aware about the dangers we have already entered and to form in the shortest time possible the critical mass necessary for the abolition of unnecessary consumption. Increasing education, but also interdisciplinary education and awareness with regard to environmental issues could be a good solution; ideas also stressed in [9].

If the results from the actions above are proved insufficient and unsatisfactory, human psychology of reward and punishment should be implemented, especially in the developed western countries where the most exaggerated consumption of resources is taking place. It is necessary to take irrevocable, rapid and decisive actions and measures. Human behavior is conditioned and driven mainly by two determinant driving forces: the pursuit of reward and the fear and avoidance of punishment. The solution is the increased taxation with regard to the consumption of resources and incentives for consumers and companies to recycle resources. These bad consumption habits modern day humans have resemble very well alcoholism or other artificially created needs. This need for consumption has been artificially "created" using the means already described, and humans are not using their filter function of will and reason anymore. The sound economic behavior of humans should be characterized by the fact that not every desire should lead to an effective need and requirement on the market. The psychological manipulation at the beginning of the XX century has transformed humans into consumption-addicted living beings. Just like other addictions, they cannot refrain themselves from the irrational consumption of goods they do not really need. Their filter function of will and reason has been wittingly and wickedly cancelled by these measures taken at the beginning of the XX century, and today they are no longer able to master their false necessities, arisen from this subtle, but effective manipulation. The costs for the implementation of effective strategies and tactics to correct this issue should be born by the states that let this happen in the past. If this is to succeed, the critical mass of the population and thus the kipping point could be reached in order to avoid the imminent disaster evolving under our very own eyes. Moreover, to ensure that mistakes are not repeated, every young person should be raised, trained and educated to properly understand the complex issues human kind is facing and everyone, instead of being part of the problem should become part of the solution.

Beside exaggerated consumption, much of the present environmental issues, such as: temperatures rising due to greenhouse gas emissions causing the melting of polar ice caps and the consecutive dramatic climate changes; deforestation in order to add more agricultural fields to economies and the related pollution through the use of chemicals [nitrogen and phosphorus compounds], have been caused by the accelerated growth of the population in the last century. Some solutions for reducing the population growth in the next period are regarding the measures for reducing poverty, increasing the level of education and family planning education. Thus, it could be possible to reduce rapid population growth in poorer nations.

Even though the population growth is taking place much more rapidly in the poor states, the consumption of resources is somehow obeying the Pareto law, that is to say up to 20% of the total population of the Earth is consuming about 80 % of the total resources and this 20% of population is representing the most educated population on Earth. Although there are some 2 to 3 billion people suffering from hunger, huge quantities of food are thrown away in the wealthy countries. This problem should be fixed in the future by finding methods to freeze or recycle the food for those in need.

Another big issue particularly affecting the poor population of the planet is polluted air, soil, waters and food. This is occurring due to the environmentally unfriendly, toxic materials and substances used for certain products. The carbon footprint and pollution caused by using fossil fuels, nitrogen, phosphorus, metals, a.s.o., should be reduced. Carbon capture and storage facilities should be increased and clean renewable energy should be used instead. Reduced soil pollution can be achieved by means of big data techniques, used to spread the exact right amount of chemicals on agricultural fields.

The linear economic model where the dependence between the production and raw materials is directly proportional should be abolished and the circular economy model where nothing gets lost, which is the healthy model of nature, should be adopted. According to ideas in this regard, the scientific media but also the European Commission Program in 2011expressed the opinion and the recommendation that the products should not only be made out of environment friendly materials and should incorporate recyclable materials into their components but also are to be designed in such a way that after their lifecycle use, they can be easily and successfully disassembled into their recyclable components.

6. Conclusions

The "conventional" economy model and the related economic theory [6] should be renounced. The irrational consumption, the overuse of resources and the pollution, taking place especially in or due to capitalist society, should cease. Using the principles of human psychology, consumer habits should be fundamentally altered.

The ecological footprint per person should be drastically lowered, especially in developed countries and the model of the circular economy wherein nothing gets lost, which is the model of nature, should replace the "conventional economy model".

The information provided by big data is starting to be used more and more intensively and it can help nowadays to calculate more accurately the impact climate change has on national and global economies.

Based on the models presented in this paper, big data technology and information can already be successfully used and applied to make much more accurate estimates of the real value added into the economy, than what was possible in the past. Through the use of big data it should also be possible to calculate more accurately the impact of the climate change, environmental change, change of ecosystems and resource consumption. Big data can be, at the same time, used to monetarily assess the negative impact of the reckless actions of humans, in order to take necessary measures.

The overuse of resources has reached its limits and perhaps the only solution available is to lower the respective saturation limits in the shortest possible time. This can be done using the recommended method proposed in the subchapter above. Thus one can correct the consumption of certain resources down to an acceptable saturation limit. This is an example to show how mathematics and big data can work together, so that they reciprocally check one to each other's results, in order to control and ensure the observance of the process of decreasing down to an acceptable saturation level, exactly in the time interval chosen..

Until the present era, human civilizations have perished or immigrated in order to survive (for example the case of some islands' civilizations). Their disappearance has been determined either due to the full consumption of their available resources or due to climate change. Nowadays, both the crisis of the climate change and the consumption of resources generated by humans and it seems that, for the time being, we have nowhere else to go. The wording "natural disaster" no longer reflects the reality nowadays - it is rather inappropriate and false. Since many present day natural disasters, especially weather related, are due to the actions of humans, nature is only fighting back against our actions. A much more appropriate term would be that of "human made" disasters.

The problems humanity is facing today need to be globally addressed by means of global economic policies. The technical solutions for the problems are already available; the only issue that remains is the global understanding and action in this respect.

History has proven that significant changes in planetary cooperation happen only after serious crises. The Coronavirus crisis, assumed also to be caused by humans entering natural wild habitats is one such crisis and the results should be shortly visible. If humans decide to take aboard the radical changes needed to avoid the disaster that is about to happen, the human species may will still have a chance to survive.

God, the Intelligent Creator, created us in His image, which is to say with intelligence and the capacity of reasoning. Now, we have come to the moment when our Creator has become very disappointed with us and thus we begin to experience the consequences of our very own reckless actions, the so called wrath of God.

We should stop the imminent disaster profiling at the horizon before it is too late.

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