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## **Geonomics, Energetics and the K-Paradox: A Sustainable Point of View**

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### **Abstract**

*The paradox truth of the Kondratieff wave phenomenon is being translated into geonomic and energetic terms of a human survivalist rationality and morality which argues against prevailing tribalist territorialism. Energy efficiency is identified as the principal law of human systems evolution, concerning the conversion of land value/natural resources into human needs; this sustainable point of view is being extended to all economic tools of human productivity and rent or interest-seeking will be discouraged in such a social model of reality. Consequently, labor and entrepreneurship will be freed from non-necessary restrictions and can reach their full creative potential for the common good, without sacrificing private wealth, liberty and classical accounting techniques.*

**Keywords:** *sustainability, monetary tools, energy efficiency, geonomics, land value, rent-seeking.*

### **The Energetic Motion of the Body Economic**

Perfect science consists of a true list of statements on a given problem for converting knowledge into applied skills; the economic transition and transformation from the industrial to the technological society, propelled via electronics, photonics and bionics, will depend on this collective or mass learning process. Sound knowledge is for predictability, but advanced wisdom decides about all outcomes; the information flow of human learning is the essence of these knowledge translations where new industrial technologies can create better living conditions for the human fraternity via the perfection of the technical potential. However, concerning the canonical harmony of applied human abilities, including precise and exact measurements, we can detect a vast quantity of perplex and paradox data bodies, be they small elements or bigger sets of information, *i.e.* we must learn to distinguish sharply between mathematical models and physical applications of the real world. Since every human society is and was basically an energy transduction system (Odum 1976), the search for tangible measurements of social motion is obvious;

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human ingenuity can, of course, compensate for non-necessary energy losses (via creative destruction and re-invention), but energy remains the foundational category of human existence in this physical world for earthly creatures (where a Spinozian 'spiritual physics' seems to guide the ethical motion of material bodies [Spinoza 1677/2005]). Real human advancement resulted, empirically and historically, in social developments that introduced energy saving techniques into the human labor processes of converting natural resources (land) into capital (technical resources or as product of accumulated labor-time). There seems to be a cybernetic circuit behind these systemic energy transductions, and measurements can surely be modeled in waves, cycles and most probably spirals. Systemic disturbances in the transduction process do mainly stem from certain key monopolies (land, taxes, money) and privileges (inherited wealth or 'unearned' income or extraction of value for no return) in production and distribution, but also partly from non-conscious collective behavior, due to the embodied cognition of human rationality and morality, for example evolutionary mass behavior such as violent upheavals or migrations (as opposed to conscious human action). Effective rational politics (doing the right things or doing things right), based on clear moral standards, can creatively sort out the best statements of scientific truth and try to shape a more optimal social system of human living chances. This might be a tall order, but it is an evolutionary necessity of survivalist rationality and morality where altruism and egotism will be balanced by fair measures (*i.e.* 'the Golden Rule') to further the socio-ethical evolution of humankind as no good deed remains unpunished in the worldly realm. In this paper, we will gradually analyze which empirical tools the human race has to apply for leaving the vicious and Sisyphean circle of exploitative, tribal and conquerable territorialism (relict of the animal kingdom) which is the prime root cause of all societal conflicts, wars, revolutions and genocidal mass killings. The contemporary migration streams of populations are only a small sign or indicator of such tectonic wave functions. It is very important to deeply understand the quantum role of energy efficiency in human social systems, for example not the lack of stones finished the Stone Age, but the socio-technical innovation of more energy-efficient existential tools, *i.e.* any real progress of technical civilization and human culture is bound to the optimal use or conversion of natural resources (land value). However, this fact does not imply that systems evolution can be socially rushed or engineered, but that we do always face the bifurcation or critical path of reform (corrective remedies) *vs.* collapse (implosion or explosion) in the ongoing chain and network of human events.

### **The Translation of Waves into Cycles and Spiral Development Patterns**

What do geonomics, energetics and the K-paradox have in common? What has all this to do with economic waves, cycles and spirals? Why is the inter-play

and inter-section of these scientific knowledge bodies so important for our common future? Geonomics is an economic approach that recommends to basically tax the social product or produces from natural resources (land value), thus to free human labor entrepreneurship and technical capital or machinery from excessive taxation; it prefers money to be an exact accounting unit that is issued by governmental authority, *i.e.* banking as a private commercial business would be forced to focus or support human productivity instead of calculative gambling, because land value would not serve as a collateral for credit (multiplied by interest). *The scientific foundation of a geonomic system* was elaborated by American economist and philosopher Henry George (1839–1897), after observing the economic events of the ‘progress and poverty era’ in North America. Energetics as a thermodynamic approach of energy transduction in living systems was mainly developed by Howard T. Odum (1924–2002), who was a pioneer of eco-system energetics informed by cybernetic models; classical thermo-dynamics was consequently extended by the bio-physical levels of the 4<sup>th</sup> order cybernetics (1=energy; 2=entropy; 3=syntropy; 4=synergy). The K-paradox or the observation of 50-year economic innovation waves (in cycles and eventually spirals) is closely connected to the innovative levels of technical progress and human living conditions; the empirical insights of N. Kondratieff (1892–1938) into the natural foundation of human societies, *i.e.* the cyclical nature of human economic activity (even in industrial capitalism), were punished by the Bolshevik persecutors, who evaluated this approach as contrary or reactionary to the revolutionary agenda of communism. In any case, from the viewpoint of today's scientific knowledge development, he was well ahead of his time, not only for Soviet standards. The establishment of the Institute for Conjuncture (1920, Moscow) was nevertheless a groundbreaking event in the scientific history of social science as it was the first research institution of this kind in the global arena. However, conjuncture is a term borrowed from astronomy and the 49–50 year observation and inter-calculation unit resembles the Biblical Jubilee (Sabbath's Sabbath/Leviticus 25: 10) where freedom or liberty shall be proclaimed (which is also the inscription on the Liberty Bell in Philadelphia), for example the sale of land is not fee simple, land can only be leased for 50 years, the lease of land becomes cheaper when closer to the Jubilee, *i.e.* we can perceive a concept or construct of a natural science of human society, a cyclical view of human economic activity that is actually land-value-based (natural resources). The deeper implication of this insight becomes visible: the unnaturalness of men cannot break totally free from natural conditions or conditioning, but we can adapt or learn by human ingenuity to improve living conditions (Kennet and Ternyik 2015) for the common good. To research into the nature of these physical facts, we do not need some moral method of textual exegesis, but this interplay of human activities is subject to formal reasoning. It does not matter in this case if the source of knowledge is divinity (and) or human history, in terms of gained

or perfected wisdom. And (please) do remember: knowledge is about predictability, but wisdom is about real outcome.

### **The Modern Monetary Production Economy and Monetary Tools as Access to Energy**

The modern money-based production economy works very differently from this land-based and natural value-based concepts of a human society; the private expropriation or extraction of land value or natural resources for social produces goes mainly untaxed as well as the collected or captured capital interests at the end of the value creation chain which flow into safe jurisdictions and institutions of private wealth management. Public revenue is progressively and excessively raised from human labor and entrepreneurship, making life harder for those who live on wage income alone (*e.g.*, the majority of working people has to rent housing and needs often credit on interest for key investments). This type of industrial (in the future: technological) serfdom is contrary to the human economy as a geo-eco-energetic circuit, *i.e.* the accounting function of money is misused or channeled (Coase 1960) as a manipulative monopoly of the actually land-based value creation chain. The basic monopoly on land and natural resources is being reinforced by a private commercialized money monopoly while the public revenue for state government is extracted from productive and entrepreneurial labor. As money has also become the general key to all kinds of energy (*e.g.*, fuel, food, fun), the exponential need for energy is increased by monetary excess, causing a global territorial conflict for access to vital natural resources. At the same time, the production and distribution circuit of the human economy is shortened, accelerated and collapsing, due to an eco-energetic short-cut. However, the economic rule of law and natural construction principles as rational imperative are discoverable and applicable by logic and reason; the time has come to move economics from an accounting profession (for private wealth management) to a management science (of creative human productivity), *i.e.* social systems sustainability will depend on this quantum leap of multiplying knowledge and wisdom for the common good, without sacrificing individual liberty, wealth and classical accounting. In the following, we will work on the precise parameters for such a sustainable economic science on this globe as social process and system of human creative action and exchange. The social science of economics is not a branch of ethical morality or mathematical physics, but a science of human economic activity; the concealed laws (construction principles of reality) of right or false direction of human economic activity can, therefore, be discovered by empirical, rational and methodical inquiry. There will always be a methodical gap between model and reality, but the current gap between monetary tools, land value and taxation of human productivity is no more sustainable as the critical events in the global economy do teach and warn

us! However, the methodical introduction of a natural (land-value-based) ratio or brake into the modern money-based production economy is not an easy walk; it can only be done on the physical foundation of an energy efficiency index (quanta) with economic respect to narrow reserve requirements. A lot of human intelligence and creativity is needed for such a reform step towards reconciling (Grinin and Korotayev 2015) the growing human needs of 7 billion people with the physical limits of our supporting eco-system; as a result, only a creative management of formal and ethical reasoning can accomplish this task which is a mathematical and psycho-physical problem at the same time. The quantization and quantification of money and energy, in ratio to the land value of natural resources, lies at the core of geonomics, energetics and K(ondratieff)-cyclicity, *i.e.* with money we pay actually for energy (quanta) and in between that interaction takes the conversion or inter-play of natural resources (land/rent) via human resources (labor/wages) into technical resources (capital/interest) place. Consequently, money as a sound accounting unit or yardstick, can be based on the physical ratio of energy quanta; in any case, this does not imply that the gambling and casino effect will or should totally disappear, because speculation and the speculator always point to the weakness of an economic system. *Homo homini lupus est* (man is a wolf to man) can only be contained by the rational imperative of law, but the wolves should not be allowed to design the legal framework of economic exchange. This new type of ethical economics is accessible by the light of reason and the passion is all about setting limits of how we ‘consume’ the ‘fruits of the earth’; as earthy creatures we should be more careful, if we take intergenerational fairness into account. In addition, we will create better living chances and reduce the over-competition (‘race to the bottom’) that ultimately spoils the biosphere and the human psyche. Empirical social science is actually about the precise or exact interplay of nature and human consciousness; and economics, to cite George Bernard Shaw, is the art to make the best of our lives, *i.e.* the empirical scientist or thinker cannot lock himself into a laboratory (experiment) or a study (hermeneutics); empirical observation and measurement flow vitally together as wave and particle or energy and matter. Human economic life is about free thought, environmental feedback and ecological resources; we are a complex living organism on this planet.

### **When Economic Rent Outperforms Productive Growth, Entropy Sets in**

Every real crisis (depression, regression, chaos, collapse) of the body economic is, in fact, a feedback signal in the geonomic energy circuit; the complex signal chain in the modern body economic may be really difficult to read, but the stewardship rules on spaceship earth are actually very simple and guided by the principle law of efficient energy transduction, in systemic terms of input,

conversion, output and transaction. In the modern monetary production economy, money quantizes (quantifies) energy, energy quantizes time, and time quantizes production, *i.e.* this is the actual working body of the quantum circuit of money, energy, time and production or the market loop. The economic behavior of acute and chronic monetary excess increases the exponential need for energy and causes the temporal acceleration (entropy) of economic production cycles and shortens herewith the cyclical intervals of depressive and regressive crises that can end up in chaos and collapse of the entire working body economic. This systemic interplay of natural resources, value creation or conversion and monetary tools lies behind all hidden economic monopolies (land, tax, credit) and privileges (inherited wealth and unearned income), driven by the principal law of energy efficiency, *i.e.* in our current money-based system, monetary emission (credit multiplied by interest) and circulation speed (digital) do determine the ecological quantum of energy consumption. The non-physicality of money performs a physical office in the markets and monetary purchasing power parity (ppp) opens access to the not man-made goods of this earth or to the socially produced land values, with the speculative and growing gap of extracting physical value for nothing or no return. The mathematical or nominal infinity of money is computed equal to the physical finity of available resources; even the simplest mind can grasp that an optimal economic resource allocation and distribution cannot be achieved via such an artificial accounting system as it is not balanced by any natural ratio. On the contrary, the reasonable developmental imperative reads, empirically and historically, that the higher advancement of an economic system demands to attain a higher level of energy efficiency and natural resource allocation. The direction (pattern) of the natural selection procedure is to limit entropy and to extend the ecological niche of bio-social life physically; increasing energy consumption of all kinds (fuel, food, fun) is causing economic systems entropy. It demands a lot of energy to convert energy from one form to another and it comes always with a loss of energy by friction, thus the system or body economic will be unable to reach a higher cybernetic order, *i.e.* it remains or commutes between level 1=energy and 2=entropy and cannot reach level 3=syntropy or level 4=synergy. According to the Snooks-Panov algorithm, such quantum leaps or temporary evolution intervals lead generally to 1/3 of former energy consumption or input for output; the Solow residual attributes this quantum gain to human ingenuity which is always done by pioneers or avant-gardes.

### **Sustainability as Adaptation and Cognitive Learning Process of Universal Cosmic Law**

There are a lot of sustainability metrics and indices available and intense research is done into the sustainability of firms, for example by financial agencies (Robeco 2015), but the background program (Komlos 2014) or hidden curriculum of monetary agency is not being questioned or reasoned about.

However, the 'nature' of money (an artifact for accounting) does not behave neutral to markets, the environment and human health. The alchemy, quasi-theology and religious omnipotence of the current monetary mechanism does end up in an energy balance of used or consumed natural resources that multiplies the economic and ecological problem of social cost. Not only the economic inter-and trans-actions do cost something, but also the cybernetic consequences ('total cost') which arrive with a time-lag; any real crisis can be viewed as an accumulation or overhead of these time-lags. Also a reform or humane capitalism will cost us something, for example new toils, unknown efforts, existential uncertainties, social stress, but if it is legally implemented in an ethical, ecological and monetary clean energy agenda, then we can be very sure to expect that the management of private wealth, the public good and efficient government can be reconciled for common progress without poverty. The contemporary monetary practice reinforces rent-seeking of all kinds and this is the main reason or cause of productive economic stoppage, because the consumption of natural, human and technical resources has become the operating systemic agenda and the extraction of value for nothing dominates or rules the human psyche. In medical terms or analogy, these economic events resemble a psycho- and sociopathic disease and a dis-connection from the physical or natural body of existence, with almost suicidal tendencies. Human economic behavior has to be rectified or corrected by a healthy revitalization of productive and creative labor that gives meaning, a sufficient income for all and growing living chances. Otherwise, this monetary driven zero-sum race to the bottom will even cost us the air that we breathe. The efficient tendencies in global asset management demonstrate a clear-cut investment stream into firms and technologies that involve in *eco-tech*, *bio-tech* and *health tech*, i.e. the professional investment world has already recognized the high net value of clean and green technology as well as that of real estate in ecological locations. In any case, 'greener' markets need 'cleaner' monetary tools to serve as real replicator of human needs which are based on limited and not renewable natural resources; every real innovation is an invention to meet unmet human needs, what we actually need are many green silicon valleys that propel us forward towards more sustainable horizons of human living chances. Effective government, dynamic market economy, monetary ecology and open public discourse are the cultural tools for a better today and tomorrow; the key to this new type of geonomic society is human cooperative fairness instead of cut-throat over-competition.

### **Conclusion (Towards a Cosmo-Centric View of Human Economic Activity)**

Sustainable monetary agency (Ternyik 2015, 2016), based on the natural ratio of a clean energy index, is one of the key economic tools to stabilize a dynamic

market economy. Every human society is an energy transduction system of converting natural resources via labor and capital technology into human needs and governed by the principle law of energy efficiency for sustainability as well as for further development. The taxation of socially produced land value for public revenue and the abolishment of natural resources as banking collateral are additional measures for a corrective systems reform, freeing labor and entrepreneurship from unfair tax burdens. The financial introduction of narrow reserve banking is necessary to reduce the speed of any form of rent- and interest-seeking; private commercial banking will be focused on the productive return of investment into future projects and governmental authority will issue money as an accounting unit for economic exchange of goods and services, creating and keeping the seigniorage as common good. Such a geonomic (George 1879 [1992]) and legal system of the human society is a quantum leap towards a crises-free economy; the wave-like character of economic production will be softened by more bearable ups and downs (frequencies) of the value creation cycle.

My scientific aim is to integrate the many observations and findings in the Kondratieff Waves Almanacs of 2012 and 2014 into a natural science of human societies in a globalized world. I understand the conjuncture method of N. Kondratieff as modern economic thought towards adaptation and cognitive learning for a more natural economic order, in terms of universal cosmic harmony, *i.e.* scientific thought as a reliable tool to discover the natural mystery of human economic activity and greater harmony as vital pattern of human systems evolution. It is this dynamic interplay of the human mind and universal life principles that make economics a fascinating scientific discipline which still has to solve the territorial conflict between private wealth management and public economic prosperity. Human progress without poverty is a real economic possibility if we will gain a better and deeper understanding of the origin and nature of human economic action in systemic or cybernetic manner. One of the greatest historical (Sisyphean) problems is the cyclical disappearance of increasing economic surplus value into economic rent, because nature (land/natural resources/location value) is treated as private property; this can be seen as the greatest obstacle for earth sharing and a sharing economy.

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