

Review

The wealth of the emerging world - the next 15 - 25 years

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The article introduces a new economic concept - domestication of a territory. In the past, harnessing the Ricardian advantage of each successive unique territory meant the development of a brand new technological package along with social institutions, custom tailored to the land's specifics. Today, we face a similar necessity of improving the productivity of territories of the developing world. They are rich, diverse and fragile, thus, hardly present a good fit for the current heavily mechanized oil-based economy, US-style. Apparently, a new approach to development is needed, along with special strategies, custom tailored both to the specifics of these territories and their ages-old social customs. We show that indeed such approaches are already appearing, grass- roots, from bottom- up, simultaneously in West and East, ranging from the use of mobile phones in Kenya by fishermen for sales/banking/micro financing, neighborhood gardens in India, new business paradigm in China (Object-Oriented Design, further OOD) to the rise of online markets on eBay and Amazon or dissemination-democratization of knowledge by Google. The rise of new forms is based on the use of the most modern technologies, enabling miniaturization and customization. We argue that this may lead to the future economy of small series. This potential opposite of the current economy of mass production would be based on the ages-old eastern tradition of artisan-style production and intensive but careful use of smallish land plots. The outcome of such a switch in paradigms would depend on the success or failure of new public/private forms of ownership, based on judicious use of public commons for the private gain of its residents. This would include such intangibles as air, land, quality of life etc, usually neglected within capitalism (Polanyi, 2001).

Key words: Public good, mass production, small series, oil, coal, private ownership, public ownership, wealth generation.

INTRODUCTION

Why did many developing countries fail to succeed despite all the effort and money thrown at them, among many examples are not only Africa, but also Russia? Why did other countries thrive despite breaking basically every rule in the book: a stark example, China? Was the global trade a positive or a negative factor in their development? And, whether the answer is "yes" or "not", the main question still remains "why"? At the end of the day, which of the opposing forces is more powerful: the economy of scale (Krugman, 1979) or the Ricardian law of diminishing returns?

Despite many important insights provided by the extant models and theories of development and international trade, they fail to answer these important questions, show many inconsistencies and are unevenly supported by data. This applies to the models within the neoclassical school of thought, focused on various factors of material production, such as labor, capital, rent, economy of scale, monopoly power etc (Ricardo, Heckscher-Ohlin further improved by Paul Krugman; the 1946 Harrod-Domar model, further developed by Swan-Solow (1956), Paul Romer (1998), Robert Lucas, Jr. (1981, 1988) etc). This also applies to the modern institutional economics, from Thorstein Veblen (1898) and Ronald Coase (1937) to Douglass North (1990), who highlighted the importance of a country's institutions in reducing its transaction costs and aiding its development. Somewhat aside is Joseph Schumpeter's 1939 Theory of Business Cycles, which, as

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to this date, were not yet fully explained by his followers (Freeman, 2001 etc).

This paper adds a single new concept to all these deliberations - domestication of the next unique geoclimatic zone. In the manner of the Physiocrats of the 18th century, the latter is seen as the ultimate source of any new wealth, both agrarian and industrial. Historically, after periodic severe crises/wars, new, previously under-producing land was domesticated with the help of new technologies and institutions. Thus, new wealth could be created as if "out-of-thin-air" to feed multiplying populations throughout history. In this way, instead of rigid limitation, the Malthusian constraints turned into the engine of development. As soon as the older territory could not support demographic growth, people were pushed OUT to settle on and domesticate new lands. Technologies and institutions served as the external human body, helping our species to adapt to new geoclimatic conditions, while circumventing the lengthy path of genetic changes.

Thus, this concept implies a need in a special adaptation in order to unlock the hitherto unavailable wealth of a new zone: production styles/systems developed elsewhere usually fail to work in a new place. Historically, unique adaptations of this sort first rose as institutional – feeding off the specifics of the local social framework. Then, this brand new institution served as a crystallizing point gradually forming an entire technological style of its time around itself. For example, in the 20th century, the mass-production of Fordism rose from the need of utilizing the untrained workforce, the only one available in a young country. The resulting oil-based economy of mass producing standardized items, which could be cheaply transported using the mass car, generated immense amounts of new wealth by opening up easy access to the entire US territory. Such areas as the Great Plains, California and Florida, in the zone of extreme climate, previously were of little use both for farming or industry. Within the oil-based economy pioneered in the US, they turned immensely productive bankrolling the well-off US consumer society.

We show that the addition of this simple concept allows reconciliation of a large array of current theories of economic development and international trade. In as much harsh their mutual disagreements, at least three schools of thought and, perhaps many more, may now be joined together as chips in a puzzle, explaining different aspects of economic development during its various stages.

1.) In regards to the neoclassical model, its well-known problems with the law of diminishing returns, which works very well in some situations but not in others can now be resolved, since this law would apply only AFTER a country was developed through its unique adaptation. Applying it to still undeveloped territories would be misleading, as factors of production such as capital, labor etc would hardly be capable of producing predictable returns: those would be either negligible or, in contrast, start as oversized well out of proportion and then fade fast. The rea-

sons are simple within the then dominant economy; any under-developed territory tends to function as a sort of under-producing "wastelands", with low expectations but huge potential. See, for example, how the US in the 19th century underperformed within the steam-based economy pioneered by Britain, but shone in the 20th century, after developing its oil-based economy and its unique infrastructure based on the mass car. Note also that as early as the 1880s, the US was already an important export-driven economy, with fast growing returns, but still dependent on British investment. This was reversed only after WWI, in the course of which Britain turned into a net debtor to the US. However, the US dominance became cemented only after WWII, with signing of the 1944 Bretton-Woods agreement and the Marshall Plan, which confirmed the strength of its unique economic model of the mass car. The latter proved its excellence during the domestication of its huge territory and could now be spread to the near periphery of the united West.

2.) On the other hand, the concept of a geoclimatic zone underscores its uniqueness and the overwhelming need in special institutional solutions, custom tailored to the specific conditions of the territory under domestication. This is an area, where the institutionalists excel.

3.) Meanwhile, the very process of domesticating a zone implies also the existence of its lifecycle. Since lifecycles tend to be fairly regular, evolving through a logically defined sequence of stages, from birth to maturity and then, gradually, to the loss of relevance, this would then help in explaining the enduring mystery of the regularity of the Schumpeterian long waves.

A known British scholar E. Hobsbawm wrote the following paragraph describing the industrial Revolution in Britain. He stressed the primacy of uniquely British institutions as compared to the purely technological advance. This quote, with its portion highlighted in bold by the authors, perfectly describes the rise of a specific cultural package for any new land use system.

"The novelty lay not in the innovations, but in the readiness of practical men to put their minds to using the science and technology which had long been available and within reach; and in the wide market which lay open to goods as prices and costs fell rapidly. It lay not in the flowering of individual inventive genius, but in the practical situation which turned men's thought to soluble problems. This situation was very fortunate, for it gave the pioneer Industrial Revolution an immense, perhaps an essential push forward. It put it within the reach of an enterprising, not particularly well-educated or subtle, not particularly wealthy body of businessmen and skilled artisans, operating in a flourishing and expanding economy whose opportunities they could easily seize. It other words, it minimized the basic requirements of skills, of capital, of large-scale business or government organization and planning, without which no industrialization can succeed". (Hobsbawm, 1999, p. 60).

After being formed, a specific cultural package, merging together technologies and social institutions, is then passed forth in its immutable form as a fixed technological style, a recognizable characteristic of its era.

Perez (2002) defines a “technological style” as a sort of “ideal type” of productive organization or best technological “common sense” which develops as a response to what is perceived as the stable dynamics of the relative cost structure.” She and other authors show that, “Thus, it demands a high level of skills, capital expenditures etc, which cannot be provided by most “emerging” nations. This, in fact, solidifies their secondary position, as they start lagging both technologically and institutionally”.

Currently, we may be already at the threshold of a new era. As it was the case many times before, the appropriate technology of digital-era customization and miniaturization may well be already here. However, it is still waiting for our readiness to apply it to its full potential. Historically, a shift from something old and well known with immense asset inertia, for something new and completely unknown had never happened voluntarily. It usually came perforce, due to the growing inefficiencies of the old economy. In our case, this may be in the future of the current mass-production economy and the related institutions, due to the increasing overstretching as they radiate to cover the larger territory of the developing world.

In the past, it took much pain and suffering to overcome the resistance of old economy, parallel to the painstaking rise of new institutions, forms of ownership and popular attitudes. The newer society and its economy are neither better nor worse than the older ones, but they certainly must be more fitting to the conditions of the new geoclimatic zone under domestication and able to feed many more people. Today, their promise would be gauged through their ability or lack thereof to lift the third world out of its abject poverty.

THE RISE OF NEW COMMONS

In 1776 A. Smith assisted at the birth of capitalism - “The Wealth of Nations” helped in socializing the man’s previously disdained though perfectly natural inclination to self-enrichment – thus individual energy could be channeled towards increasing the overall public wealth. However, as Polanyi stressed as early as the 1940s, wealth, measured in personal possessions, is only part of the pursuit of happiness. In this age of global warming it there increasingly adds also the problem of environment, including both nature and neighborhoods. It is tightly related to one’s health, one’s ability to support a family, be a part of a personally fulfilling community, hold a job etc. As of today, none of this is guaranteed within capitalism, which as Polanyi suggested might have led to its better efficiency as compared to the traditional society.

However, the latter also does not present a solution due

to its lack of competitiveness, which hints at its inability to feed the growing masses. The solution, as usual, might be somewhere in the middle, through promoting ownership, which would fit the paradigm of capitalism, but in socially acceptable forms, which are already growing through current grassroots initiatives. The latter range from businesses to government programs to non-profit groups. Among novel examples, Cadbury, a chocolate company, had to reduce the price of its chocolates for its developing-world markets. Since the Indian government placed a 7% tariff on imports of cacao. Cadbury opened its own cacao-seedling nurseries, which it distributes for free to surrounding villages. Nurturing thus the communities of its prospective local cacao suppliers helps in the purely capitalistic goal of lowering costs. Similar revolutionary shifts were caused also by government-trained agricultural engineers, who led an effort in communal mango cultivation in India, proliferation of mobile telephones in Kenya, which help local fishermen to find customers and do their banking and, according to estimates, contributed at least 1 - 2% to the Kenyan GDP.

Such examples point at an extensive and widening trend. The time may be ripe to socialize ownership per se, in a wide variety of forms, from public to private. Instead of dividing people within a wealth-stratified, antagonistic and, more often than not, self-destructive society, new forms of public/private ownership, based on mutually-enriching self-interest, may help in increasing the productivity of the currently under-producing territories. Public/private partnership may open the possibility of domesticating new, diverse and fragile lands, where communities shape priorities and state goals, in order to assure the long-term health of their locality, while private owners, both from the neighborhood and out of it, are motivated by the need to receive profit. Such a shift may bring together and reconcile up-to-this-date contradictory goals of profit and happiness, enriching considerable numbers of motivated individual owners, while also making them happier through better socialization.

The new affluence for the currently suffering masses would come from domesticating a vast virginal/underutilized underutilized region and taking advantage of its own unique resources and economy. Turning the entire habitat, including the current “no-man’s” wilderness, such as forests, air, bodies of water etc into their permanent home, thusly socialized wealth holders/wealth sharers would become engaged in maintaining its long term health, both ecological and social. “The invisible hand” of [entire habitat’s] ownership would help in channeling the man’s natural pursuit of happiness towards increasing the common good.

Obviously, this would also put new, previously unthinkable demands on the level of public education and health, as only a well educated and healthy population is capable of the required degree of informed sophistication and energy expenditure. This is not a hopeless task, as today there are already new revolutionary tools for disseminating knowledge and democratizing the know-how through the

internet and various online communities. The ongoing revolution in information technology may be on par with the invention of book printing, which, at the dawn of modernity, destroyed the monopoly of the Church, up to that date, the sole repository of books and knowledge. This opened the way for the Age of Exploration, when enterprising people fully exploited the new-found ability to cheaply print and widely disseminate maps, books etc. Book printing also contributed to the political liberation during the Reformation. It was also a factor in starting the so called Religious Wars, just as the digital world helped the jihadists. This points at the brewing disagreement and dangers ahead, typical during revolutionary changes of the society. Today, the old economy seems unable to feed the masses of the developing world, but it also possesses immense asset and institutional inertia and would not go away in a peaceful way. It also would leave huge institutional void and it would not be easy to fill its shoes.

It is not like all would be joy and happiness if we "just say yes" to our innate right of ownership. Britain was covered with inhumane workhouses, while Smith was writing his hopeful treaty and even long thereafter. This sad reality brought in the 1798 Malthusian half admission/half apology that the suffering of the "low" classes along with periodic events of "thinning" the entire population are unavoidable as any other law of nature. Similarly, in the 20th century, an effort to domesticate the American Plains produced at its start the infamous "Dust Bowl" and impoverished people instead of feeding them, as was promised from the start, but happened only decades later. We can be sure that there is a long and tortuous way ahead of us. If old patterns continue to hold, it may be about half a century long, as we'll show below. Procuring its maps and schedules before our perilous journey into the future might help in avoiding its many dangers.

In this paper we consider promises and pitfalls of the future domestication of the harsh environment of Africa and Asia housing the billions of the emerging world.

Today, the entire planet teeters on a razor-thin edge between the promise of development in the case we succeed in maintaining peace and stability and the massive conflagration of wars/revolutions if we do not. The outcome depends on whether the extreme geoclimatic zone of the developing world feeds or fails its immense population as they strive to improve their condition. The territory in question is quite harsh and does not seem too inviting for the modern economic model championed by the US, based on the cultivation of a few select monocultures delivered to the market via dense networks of highways. Developing a new economic/technological adaptation may be a must for successfully domesticating these vast continents, while assuring adequate livelihood for their population.

Thankfully, the experience accumulated during the nearly 7 thousand years of history may be holding a key to avoiding the possible pitfalls of the future: each of the 6 traditional historic periods, from the first civilizations to the modern mass society exemplified by the US, evolved

according to the same scenario as its unique geoclimatic zone was being domesticated, creating value out of previously neglected/unusable landmasses and resources. The newfound wealth was appropriated from nature by developing a brand new form of ownership, unique for each period.

In this work we attempt to map the successive stages of domesticating a new zone, with the near term forecast of the waning of the current Oil Age within 15 - 25 years or so. If the persistently recurring historic patterns continue to hold, oil would be replaced in its dominant role with a new inelastic resource - first appearing as one of oil's substitutes and then growing in importance as the foundation of future wealth generation for the rising zone. As no resource per se, however important, would guarantee neither wealth nor happiness, we concentrate on the next prevailing form of ownership and show the promise of public property in an hitherto unknown capacity to assure public/private cooperation as essential for domesticating the extreme zone of the emerging Africa and Asia in their peoples' pursuit of happiness.

THE WORLD IN TURMOIL

The swift growth of modern Asia on the background of continuing turmoil in Africa and the Muslim world brings this region into the forefront of both news and development. Obviously, this geoclimatic zone of extreme climate has to be domesticated with the use of new technologies, capable of providing acceptable living conditions to the billions of people of the emerging world. Russia and China occupy the opposite ends of Asia with an underpopulated north, rich in resources, heavy industry and science, and an overpopulated south, acutely needing the said resources and science-heavy industries holding the key to better margins/productivity.

Next to China lies India, with immense social problems and promises of technological development juxtaposed in a complex mosaic. The soft underbelly of the region is in Central Asia, adjacent to the awakening Muslim world, with its jihad paid for by oil profits. Smack in its middle sits Israel, which possesses the technological know-how for domesticating the inhospitable desert land and feeding the suffering multitudes, while in no small degree contributing to their pain, among other things by using nearly all the available local resources of fresh water. Next to it is Africa, where the fall of the apartheid didn't bring prosperity as it was hoped. Instead, the continent is mired in seemingly never ending ecological and humane catastrophes, losing its population to AIDS, while also sending it off to wars and precarious journeys to anywhere they can find a job, most notably to Europe, but also to jihads. In its turn, Europe, including Russia, suffers from low birth rates and is being flooded by immigrants from elsewhere, some of the latter (that is, coming from the Eastern Europe) leaving their own under populated lands behind. The low birth rates plague Europe and started to catch up

in China on the background of the explosive growth in Africa and the Muslim world, which still did not tame their death rates and continue losing their dejected youth to wars and immigration. This imbalance of global death and birth rates serves as an unmistakable biological marker of the exhaustion of the current economic model in its capacity of feeding our suffering species.

Obviously, the humankind is on the move, surging forth from a huge bleak “emerging” territory manifestly inappropriate for the current economic paradigm. The latter’s reliance on water-based or auto-transport and large-scale irrigation, seems hardly possible in Asia and Africa because of the harsh climate, overwhelmingly continental landscape with soaring mountains interspersed with deserts, and in the conditions of mounting shortages of arable land and fresh water. A new paradigm of development is direly needed, in order to avoid a huge conflagration in the rapidly urbanizing emerging world with its increasingly desolated/depopulated rural lands left for city slums.

Historically, the start of an era had been accompanied with wars and massive catastrophes. The starting period until all kinks are successfully ironed out tends to be quite turbulent taking up to an half of the entire duration of a particular era – the last time around this coincided with two world wars separated with the Great Depression. Considering the sheer number of people in the emerging world, the future crisis might well eclipse in its scale the first half of the 20th century perhaps by an order of magnitude. The proper understanding of pitfalls and promises of the future development through analyzing the recurring historic patterns of the past may assist us in avoiding revolutions/wars through mutual cooperation of interdependent peoples. Obviously, the interests coincide, despite a plethora of hurts and mistrusts: the West needs a fresh place to deploy its technologies, while the East seeks a major institutional and technological break through.

In the same manner, the US grew in the 20th century by adapting to its needs technologies developed in Europe, from the car to the nuclear bomb. Even its innovative organizational logistics of mass production, the foundation of the business model known as Fordism, can be directly traced from Ford to Taylor and then, straight to the head of the Prussian General staff, von Moltke the Elder. The latter reengineered the Prussian army and turned it into the best fighting force in Europe, able to defeat the brilliant French army in the French-Prussian war of 1870-1. By adopting these ideas to the US-based reality of a large population of untrained immigrants, the only ones available for its factories and plants, Fordism greatly improved the level of productivity eventually enriching the entire country, as it was gradually domesticated using the car, the tractor and the truck.

MAIN TERMS AND DEFINITIONS: GEOCLIMATIC ZONE, COENOSIS, INELASTIC RESOURCE

Fortunately for us, domestication of a new zone, starkly

differing from anything known before, took place already at least 6 times in history, from the ancient first civilizations and up to the modern US. A rich frame of reference has thus been accumulated – at the cost of immense suffering and no less impressive triumphs civilization gradually spread its tentacles forth, domesticating ever newer and larger geoclimatic zones as soon as the growth potential of the older ones has been exhausted. Each of the traditionally differentiated 6 historic periods corresponds to a distinctive geographic area: with its unique climate, a specific package of plants and animals in cultivation, its own culture and predominant language. Each and every time, the process of domestication unfolded according to the same persistent scenario. The growth of the interdependent layers of the emerging society, further called a coenosis (plural: coenoses), was being underwritten by its unique and abundant local resource, such as oil for the US or coal for Britain, in the process of building a zone-specific infrastructure for its procurement and utilization. The inimitable social institutes of an era optimized the appropriation of its area’s natural resources.

For example, the first civilizations grew on the super-productive loess soil of the great rivers’ basins, in a tiny, but incredibly fertile geoclimatic zone. The irrigated land, the main source of wealth of this coenosis and its chief object of appropriation from nature, was essentially man-made and could have been created, only with the application of collective muscle power of great masses of people, the main energy resource of that era. Dense human agglomerations, managed by the complex bureaucracy of royal and priestly domains, could now be fed thanks to the great increase in soil productivity brought in by skillful irrigation. Society-wise, the task of building and maintaining the immense networks of canals, which was done by the effort of work-gangs of corvée labor, led to the egalitarianism of the first civilizations.

In the same fashion, the British Empire of the 19th century rose to rule the world empowered by its unique local energy resource, coal. Informatively, the start of its growth is traditionally dated from the so called Agrarian Revolution of the 17th century, well before mechanization could make any meaningful inroads. Surprisingly enough, the so called “enclosures” of the commons may have been enabled by the growing domestic use of coal. Previously, these “wastelands” were crucial for producing the dominant energy resource of the previous era, firewood. Now, they could be “freed” for other economic uses as charcoal was gradually substituted with coal (Clark, 2002). This new object of appropriation from nature led to the unique British innovation, private ownership on land, which retained its value regardless of the presence of peasants, previously considered the only measure and guarantee of land productivity (Badalian and Krivorotov, 2006). Coal truly shined after the Industrial Revolution, as its functionality expanded and an entire thriving economy was built around it. “The sun never set over the British Empire” as it spread forth using the so called gunboat “diplomacy” and the

“agrarian” colonialism, the inseparable elements of its coal based global infrastructure. The cost of “white” settlements proliferating within the global zone of temperate climate was underwritten by cultivating a few highly profitable commercial plants, such as tobacco, cotton and sugar cane. Before, they grew in a few natural habitats, but now, within the coal-run economy of laissez faire, they could be farmed all over the world in order to be delivered to the customer from afar. The huge commercial flows circling the world on the steam were managed from London, the center of the immense British controlled infrastructure of the global trade. Technologically, it was based on building and maintaining coaling stations; militarily – on gunboats; with finances based on the “gold” pound sterling controlled from the London’s City. The value of the currency was supported by the African and Australian gold and the payments from India, a British colony, for administering it, which alone covered two fifths of the state’s budget (Hobsbawm, 1999). Considerable costs of supporting the global coal-run infrastructure with its networks of coaling stations were more than covered by a seigniorial cut taken in London from nearly any global transaction regardless of its parties.

A similar leap of development took place also in the 20th century, on the territory of the then leaders, the US and the USSR. It was based on their own abundant local resource, which was, of course, oil. Technically speaking, the USSR never developed a full fledged oil based economy, US- style, with highways and the mass car. It can be argued however that the country managed to survive due to its wholehearted dedication to the oil based technology deployed at immense cost at especially crucial junctions – the tractor, the truck, the tank and the airplane. For example, the excesses of collectivization could be partly compensated for by the use of the mass tractor. As a result, townsfolk could be fed – it is well known that, towards the end of the NEP period, this was becoming a serious problem (Roberts, 1989). Similarly, the accelerated development of the tank and the airplane in no small part accounted for the victory in WWII. The tractor and the truck were also crucial in carrying out the great Soviet projects of electrification and irrigation, mirroring the Hoover dam, TVA and the similar New Deal undertakings. They were also instrumental in ploughing the virginal lands of the so called “Tselina” in the 1950s. Just like the American Great Plains, made productive a decade earlier, these were in the zone of extreme climate, previously beyond the reach of the farmer.

The growth of contradictions between the oil based technologies and the old-fashioned command-style economy eventually resulted in the collapse of the USSR. As noted by E. Hobsbawm during a conversation with the authors, the SU managed to develop the best economy of the 19th century, alas, in the 20th century. It can be argued though that the reasons for this were rather trivial, having less to do with ideology than, say, geography. It is hard to imagine a dense network of highways in a country, half of which is in the permafrost area or rendered impassable by the thaw in the springtime. Thus, the SU had to rely on

railroads. The US meanwhile benefited of oil economy handsomely and fully, developing a dense network of highways and byways (Roberts, 1989). The country’s economy prospered - the rate of wastage was greatly reduced as the finished product could be speedily transported to the market using the mass car.

The leadership of the US was strengthened by its better ability to enrich and motivate its citizens which helped to collect their funds redirecting them towards business. The joint stock market, the unique American invention and its dominant form of ownership, was instrumental in collecting immense funds from its motorized affluent masses, mostly for financing its great corporations. Currently, despite the ongoing “flight” of its manufacturing, the country manages to support the high life level of its population through its continuing financialization, a process, which was not completely stopped even by the ongoing crisis. Despite a massive minting program, the dollar remains the universal currency, even though it is somewhat weakened by the rise of competing regional currencies, from the euro to the yuan. The dollar remains at the heart of globalization, financing credits and the related global flows of goods. Up to the crisis, the immense commercial flows circling the globe were carried by a three-way trade: China sold consumer goods to the US for dollars, paying this universal currency elsewhere for resources and technologies it needs. Today, there are signs of intensifying regionalization - China is stockpiling resources to unload its dollars, while also switching to bilateral trade agreements payable in local currencies, from Brazil to Russia.

As it was the case in the 19th century with the global trade monopoly of Britain, the modern trade is supported by a unique system of political, legal and financial obligations, based on the dollar. On the practical level, this results in the de-facto financial monopoly of the dollar as the leading exchange and reserve currency. Mirroring Britain, the military prowess of the US helps to maintain and enforce the current global trade space. In its turn, its other vital component, globalization, was enabled by considerable cost efficiencies brought in thanks to the container-based transportation system. Starting from the 19-90s it was supported by the rise of the Internet, which dramatically lowered its costs while improving efficiencies. As with Britain, which also started to dominate the global trade after introducing the mass steamship in the 1890s, similar technological “swan songs” of the fading dominant closer to the end of its era are fairly typical and took place in nearly every known historic period: from Assyria to the US.

This brings us to a rather unexpected conclusion regarding Russia, the US-Nemesis in the 20th century. It can not be excluded that private ownership on land contradicted its geoclimatic reality. In the 19th century, at the height of the British coal era, Russian communal woods could not be functionally replaced with coal in the fashion of Britain, due to the lack of suitable roads and stunted production. Thus, instead of creating viable peasant households, their 1861 “privatization”, similar to the British enclosures, rendered midsize holdings economically untenable.

ble. The October Revolution was the end result, after tensions and deficits were further exacerbated during WWI. In the 20th century, a profitable mechanized farm in the manner of the US could hardly be possible in the absence of adequate auto-roads on the swampy territory, hardly a good fit for the rise of US-style motoring masses.

As shown by these and similar historic examples for other distinctive periods, presented in other works by the authors, each traditionally accepted historic era unfolded by domesticating its clearly defined geoclimatic zone, by learning how to utilize its abundant local resource, which was previously underused/neglected. Thus, in order to achieve true dominance, a country's local energy resource had to present a perfect match to the specifics of its territory. If they happened to fit as a glove fits the hand, this could start a self-reinforcing process - the very use of this new resource, which was not considered valuable before, could have assisted in creating brand new objects of ownership, laying thus the foundation of its society's wealth. The unique technological style of an era formed in win-or-die social battles, gradually fulfilled its potential of enriching the masses through a trickle-down effect, most recently, creating such phenomena as the American consumer society.

THE ECONOMIC SPACE OF A SOCIETY – THE NEXUS OF ITS INSTITUTIONS AND TECHNOLOGIES

We introduce a new concept of economic space as the institutional nexus of any time/place-specific society. It is a geographic as well as an historic concept, introducing territory and historic time into the analysis of known economies, such as the slave-driven Roman economy, steam/coal-based British economy from the Industrial Revolution and up to WWI, or the current oil-based mass production economy, US-style. The central feature of any such distinct historically/geographically defined economic space and the related unique economy is thus its connectedness measured through the ease (or the lack of thereof) in exchange of goods and services throughout.

The maintenance of connectedness became the main aim and justification of existence for its leading institutions which formed the crucial part of its Wide-Area-Topology (WAT). Synchronization of local contexts-beliefs-attitudes-behaviors was thus achieved by broadcasting/enforcing standards and norms throughout the wide area under domestication during trade/exchange of goods. In contrast, animals are locked with Local - Area- Topology (LAT) and were proven incapable of sharing (Saxe, 2004). The dichotomy of local nodes connected through wide-area networks (LAT-WAT) corresponds to its well-known analogue in the information-technology WAN-LAN (Wide-Area-Network/Local-Area-Network).

By design, WAT is implemented through the interplay of two mechanisms: the cultural “software” of institutional rules and behavioral protocols/algorithms and technologi-

cal “hardware”. The most important form of the former is the prevailing form of ownership, which historically ranged from the communal property of the first civilizations to the modern joint-stock company. It both places people in hierarchically-defined roles and motivates them. Meanwhile, the latter is defined through infrastructure. Historically, taken together, “software” and “hardware” of its time delineated the geometry/size of the historic area under domestication. Its limits were a line drawn in sand by the reach of its infrastructure, which physically connected its points (such as Roman roads, industrial railroads or modern highways). Organizations served as an important link, implementing rules through socially managed and socially approved behavior (from corvée labor of the first civilizations that built the dams/canals/monuments of that time to the modern credit system, the foundation of the middle-class-style consumption and the main engine of the mass economy). Thus, through its unique institutions and means of transportation-communication, which together formed its WAT, a given society over its entire area of domestication.

Below we show that the lifespan of specific societal institutions within a unique WAT, the base of the entire time-place-specific economy, rose and ebbed according to the connectedness of the economic space they serviced. Historically, the rise of new institutions corresponded to a society-wide agreement regarding their necessity and to the widespread willingness to bear their costs and be subjected to their enforcement. In mathematics, the connectedness of space or the degree of its unity is measured through the ease of flow of global content through local contexts.

This presupposes synchronization of local contexts over a wide area, in our case, within a unique WAT created specifically for uniting a given economic space around its own distinct economy. We show that such societal synchronization became the main function of the related WAT as it defined the size of the historic territory it serviced.

Within this interpretation, common culture, shared throughout the entire economic space, functions as glue/the main tool of its connectedness. Meanwhile, specific historic institutions were known to either improve the connectedness or destroy it, depending on the stage in their lifecycle. Institutional rise-and-fall occurred repeatedly throughout history. For example, during the transition to the first civilizations the earlier tribal institutions grew increasingly inadequate and were destroyed. The new type of connectedness was achieved within the next urban economy, where the main actors were neighborhoods instead of the blood-related kin of the earlier period. The tribal elders were replaced by the urban administration, while the cults of ancestors were superseded by local gods, mostly charged with maintaining fertility.

Historically, there was a recurring conflict between two polarities: the “punctuated” and the “continuous” types of connectedness, which prevailed at consecutive stages of domesticating a territory. We define the punctuated con-

nectedness as the intensive use of only a few selected points of a territory, for example, by settling isolated trading stations, with a sole task of collecting goods in the neighborhood for sending them back to the metropolis. The continuous connectedness, in contrast, signals a much higher degree of integration and land utilization through dense settlement all over the territory. The first type of connectedness is usually accompanied with social stratification, and, at least, a degree of authoritarianism, since it implies exploitation of locals. The second meanwhile, is founded on more democratic principles, with public institutions supported by the majority. The switch from the former to the latter is usually accompanied by a profound technological shift physically enabling a better connectedness and an ideological clash due to the change in basic attitudes and expectations. Among many historic examples is the shift from the ideology of Mercantilism to the Smithian *laissez faire* in the wake of the American Revolution. The Blue Ribbon Commission, assigned to analyze the British loss, blamed the suppression of trade and freedoms of representation, due to the then dominant ideology of Mercantilism. Its conclusion was that the unnecessary surge of antagonism between the British colonial administration and the colonists led to the incredibly costly defeat causing the loss of the American Colonies. The Commission decided that this outcome could have been avoided by fostering accord through mutually beneficial free trade. The Smithian *laissez faire* ideology, which, auspiciously, was introduced in 1776, was later accepted on the highest official level. Serving as the foundation of the British Dominion it glued together its diverse regions through self-interest. Technologically, this was accompanied by the rise of better/cheaper transportation, starting from the mass use of windjammers and up to the steam.

In the same manner, the American Civil War unfolded as a conflict between two antagonistic models of white settlement reflecting the incompatibility of their types of connectedness. From the one side, there was the punctuated connectedness of the American South, whose plantation economy centered at cotton served the European, mostly British interests. From the other, the Industrializing North, with its continuous connectedness of free settlements, was aimed at fostering the inter-American trade. At about the same time, a similar punctuated economy of the Russian Empire, up to the 1861 emancipation of serfs, was built around producing wheat for European exports. Strikingly, both the American and the Russian societies managed to create a subservient stratum of population for their punctuated models of connectedness, even though before there was none. In the American case, slaves were imported from Africa. In Russia, the ruling classes enslaved their own peasantry, with the severity of the serfdom growing synchronously to the surge in flows of wheat exports from the rule of Catherine the Great.

Connectedness continues to define modern economies as well. For example, the exaggerated urbanization of the

developing world rose as a consequence of their punctuated connectedness within the modern economy of globalization, where these megalopolises serve as export entrepôts. However, these trade flows differ dramatically from those in the 18th, 19th centuries, due to the loss of importance of food exports. From the 1860s their direction was gradually reversed, with food now exported from the heavily mechanized developed world to its periphery. That is why the former agricultural areas between huge towns in the third world lost their economic value. They are increasingly depopulated and grow desolated, with their former residents moving en masse to slums in huge megalopolises, which are busy with exporting abroad both the natural resources of their land and the fruits of the labor of their residents.

Historically, societies with better connectedness could easily out-compete their rivals, due to the better use of their territory and a higher level of national unity/consolidation. This means that, for the current developing countries to thrive through development, they have to find ways to improve both their connectedness and economic usage of their territories. The possibility of building an adequate WAT depends on new technological tools and social institutions able to assure cheap transportation/communication, affordable vital services, such as banking/credits, education/healthcare etc for the residents at even the farthest and the most remote periphery.

While daunting, this is far from a hopeless task. Historically, new technologies of transportation/communication opened up revolutionary opportunities, which previously were unheard of. Consider, for example, the US in the 19th century. Prior to the transcontinental railroad, built in the wake of the Civil War, it was easier to set sail to Europe from the South than trade with the North. The connectedness of the US-territory was further dramatically improved with the advent of the mass car, the foundation of the current oil-based economy, which brought prosperity and assured political leadership, while Britain, the earlier dominant, faded.

Today, as shown in (Badalian and Krivorotov, 2009a, 2009b) the growth of the novel digital space may cause no less dramatic power-shift through immense democratization of knowledge, perhaps, on par with the invention of book printing. This includes know-how, finding customers affordably through the Internet, reducing costs of health-care, education, banking etc. The latter may be greatly improved with the help of novel institutions on the internet and in physical neighborhoods connected digitally. This new economic space might significantly lower the costs of distribution erasing the need in middlemen. The possible related loss of importance of huge entrepôts in the third-world may also improve the economic value of its countryside, following in the footsteps of the post-Civil War development of the US.

This and other examples show the instrumentality of the concept of economic space both for analyzing historic societies and providing recommendations for the modernity, down to the level of the individual firm. Apparently,

such cutting edge companies, as Google and Amazon, the current leaders at improving the connectedness in economically and socially affordable ways, stand to reap immense benefits. If they succeed, they may become comparable with Ford and the mass car, which provided affordable means of connectedness for the rising US.

Connectedness can be used not only macro-economically and socially/culturally, as shown in this paper. It is also a useful micro-economic tool. Though this remains outside of the scope of this paper, its instrumentality can be demonstrated down to the level of an individual firm. The health and activities of the latter can be gauged through a set of related measures, both internally, within the organization, and externally, through its participation in the cutting-edge development aimed at improving the connectedness of the nascent or existing economic space.

Adam Smith was absolutely right - the right social institutes lead to the creation of immense public wealth as if out of "thin air". However, these institutes are extremely time/zone sensitive. While oftentimes persisting well past their prime within the environment of their "birthplace" geoclimatic zones, they seem nearly non-transferable to anywhere else. Among examples: the communal organization of the first civilizations; the polity of classical Greece-Rome; the manor of the mediaeval Europe, where land came from serving one's suzerain and its value depended on its being populated or not by peasants; royal charters of the Age of Exploration; private land ownership in Britain, with land "liberated" from peasants; the stock market supporting the corporate form of ownership, including the mechanized farm and the family house mortgaged to the hilt. In the case when a perfect match of a particular technological style to the environment under domestication could be and was in fact achieved, historically, it led to a huge leap of productivity compared to the previous era. This allowed feeding many more people on the level previously affordable only to a chosen few. Such signatures of their time as the mass car were elevated to a new status as the foundation of economy out of a mere toy for the rich as it was the case at the car's birthplace in Europe.

Note also that, for the industrial growth to start, it usually had to be preceded by a significant leap in agriculture. The latter came as a start-up perk from domesticating and farming a formerly desolate and under producing territory. This perk arrived well before the technological style of its epoch could in fact be formed. For example, the increased food production of the so called Agrarian Revolution of the 17th century Britain (well before steam-based mechanization) came from privatizing communal forests, as charcoal was being substituted by coal. According to estimates this amounted to as much as the third of the entire economy (Clark, 2002).

The introduction of an era-specific energy resource, ranging from the muscle power of large collectives of the first civilizations to coal of the Industrial Revolution and, now, oil, called for the establishment of suitable social institutes for appropriating new, era-specific objects of ow-

nership, being created on the go, as if out of nothing. It also started a long and arduous process of building a working infrastructure for this resource's procurement and timely delivery, a necessity if one wanted to use it as the base of a thriving economy. Apparently, this resulted in drastic changes in nearly every single detail of the then social life. The existence of a resource-related lifecycle is the underlying reason for the same repetitive pattern recurring within each historic era.

Each and every time the very same scenario was being played out as the unique technological style of the time was being gradually formed to sustain the growth of its mutually dependent feeding chains/social strata. The initial investments came from a grandiose write-off and a follow-up dismantling and appropriation of the vital infrastructure of the previous period, such as the commons in Britain or 160 millions acres of grazing land in the US, which, prior to the introduction of the mass tractor, were needed for supporting the draught animals. Further development was achieved by greatly widening the functional usage of the new resource through appropriation of new, previously unknown objects of ownership created with its help. The latter ranged from the communal property of the first civilizations to the land market, the foundation of laissez faire capitalism in Britain, to the corporate property of the modern US. The social institutes of the time were molded on the go in order to perfectly fit the specifics of the related geoclimatic zone and its chief energy resource.

THE AWAKENING OF THE EMERGING WORLD – DOMESTICATING A NEW ZONE

Below we present a short review of the typical life stages of a coenosis. Historically, growth was induced by a local adaptation, as a locality on the far periphery attempted to compensate for its shortfalls and deficiencies. In response to acute shortages and growing costs of the dominant energy resource of the fading era - in our case, oil - the latter was being substituted with something local, abundant and relatively cheap. For example, the British substituted wood with coal. Similarly, in the 19th century the US did not have a full fledged coal economy and "jumped" into the Oil Age straight from the Age of Wood as they cut their extensive forests down. Today, it might be natural gas, with the potential of bridging our path to the renewable fuels, from methane to hydrogen. As a rule, such local resource is cheap and abundant, thus, it is used whenever possible. In the process of looking for functionally innovative uses for this new energy source a new technological style is being created that someday may personify its era, such as Coal Age or Oil Age (Roberts, 1989).

1.) Comparative advantage: While a new economic paradigm is being formed, one of the countries leaps forward. Due to its super-efficient local energy resource it turns into the so called "growth pole", obtaining a Ricardian comparative advantage through a successful adaptation

to its zone. For example, in the 20th century until the 1973-81 Oil Shock the US was the largest oil producer. Its prosperity was based on Detroit, the birthplace of the mass car that allowed domesticating its huge territory on the "cheap".

2.) Resource Dependency: After developing a stable package of technological and social standards the leading country creates a plethora of jobs, which makes its population affluent. The cost, however, is high in specialization along with a growing dependency on its inelastic resource, the lifeblood of its extensive infrastructure. For example, the well-off US consumer society grew along its highways, suburbia and shopping malls, which nowadays tend to house even schools and clinics. The country has practically no public transportation. The car is the way of life - driving starts at 16 to end with one's death.

3.) Imperial Stage: Rather sooner than later, even the richest deposits of the local inelastic resource are bound to be gradually exhausted. Searching for more, the country is pushed out, to its far periphery, which, as a rule, tends to be quite hostile. The depression of the 1980s was caused by cost increases in the US, increasingly uncompetitive against more efficient producers in Japan and Europe. To counter this, the Reagan's US came to an agreement with the Saudi Arabia creating in effect the petrodollar (fiat dollar) that came to replace and further enhance the abandoned gold dollar of the Bretton-Woods agreement. This marks the start of the imperial stage of development aimed at building and maintaining the global infrastructure of oil. Note that each of the 6 known historic coenoses lived through a pronounced imperial stage: 1. The Assyrian-Babylonian Empire; 2. The Roman Empire/Pax Byzantium; 3. The symbiotic union of the papacy with Spain; 4. The Napoleonic Europe; 5. The evolved colonialism of the British Empire and the Berlin Club of the so called "Great Powers"; 6. And, finally, the modern US. Historically, supporting an empire was quite expensive, including fighting wars for dominance and maintaining the global infrastructure of trade evolving and revolving around the inelastic resource of the era.

4.) Passing the command: As technologies grow more portable and zone-insensitive, the aging leader radiates them to the far periphery as payment for imports, first and foremost, of resources and labor. As the expenses grow exponentially, the dominant enters the stage of financialization, which was well pronounced from the ancient Babylon to the British Empire from the late 19th century and, currently, in the US. This is accompanied by outsourcing and the flight of manufacturing abroad, typical at the end of each historic era of the past and also prominent today. Due to improved communications and substantial wealth accumulation, outsourcing figured prominently both in the late Roman Empire and Spain of the Age of Exploration. With the growth of steamship transportation it grew in the 1890 - 1910s Britain. Since the growth of Internet-orchestrated container shipping in the 2000s it became prominent in the modern US.

Thus is formed the winning techno-cultural package, which is later disseminated all over the Oikoumene. It turns out that taking the inelastic resource from the others is not a one-sided transfer. The far-off periphery thus gains access to the technological space of the fading leader. The former outsiders rapidly absorb its advanced technologies adjusting them to the specifics of their localities. Today, for example, expensive infrastructures of the recent past, including but not limited to electric transmission lines, telephone networks etc, are being rapidly discounted by the evolving possibility of deploying much cheaper substitutes. Already, micro-generation can make use of diverse local sources of energy: water, wind, sun etc... Land phone lines can be and are indeed being replaced by the Internet and mobile telephony... As the tax base weakens along with the softening of the 20th century style mass employment, the advent of new technologies, which enable decentralized micro infrastructures, decreases the relevance of government supported networks of electricity, telephony etc. The ongoing globalization eats at the technological dominance of the older leader, discounts its social and power institutes on the background of diverse local adaptations being created all over the world.

Meanwhile, the strategic energy resource of its era becomes increasingly inelastic. After the deflationary period of "financialization", this leads to the start of yet another inflationary stage. This stimulates the search for the inelastic resource's substitutes. As the growth potential of the older region is being exhausted, the process described above would start again, in a different geoclimatic zone, based on its own abundant resource, allowing great simplification of the older technologies on the backgrounds of commoditization and cost reduction while new functionalities for existing products are being developed. These new conditions would call to life their own appropriate social institutes bringing thus new power groups to the top. Today, for example, Asian growth was induced by needs of the current dominant, the US. Its outcome may bring more than the latter asked for. In the same manner, the US greatly increased its arable answering the European demand for grain following the Turkish blockade of Dardanelles (and Russian grain) during WWI. The end of WWI brought a drastic change in the global geopolitical balance.

UNEXPECTED LESSONS OF HISTORY

According to the short review above, lessons of history seem at least at odds with popular expectations and attitudes.

The moment, when a dominant, in our case the US, has finally achieved its highest triumph, with its values widely accepted and its lifestyle coveted by millions, in fact signals the start of its descend, as the exhaustion of growth potential within its native zone pushes it towards far-off hostile "wastelands" of its distant periphery. In the

near perspective, this foretells an imminent shift of development to another zone as the aging leader starts to gradually fade. But, before it fades away, the older leader would produce its top achievement – an affordable, portable and notably zone-insensitive technology, such as the cheap steel at the end of the 19th century or the computer chip today. Using it, it would build the global infrastructure for outsourcing and faraway resource retrieval. Ironically, this very technology would also enable the domestication of the next zone. Through crises and upheavals typical for such a shift, its rising coenosis would grow on its resources that could not be used in this quality before. For example, the internal combustion engine, the foundation of the future US oil economy that let to domesticate its land economically, was enabled by cheap steel.

As social institutes of any era must fit the unique conditions of their geoclimatic zone just as a glove fits the hand, they can not be transferred in their entirety in principle. This stays true regardless of any cherished ideology or its total lack thereof.

The US presents a good proof of this point. Despite popular beliefs in the capitalist ideology of “free” competition, the country has little in common with the classical British laissez faire. Unlike the latter, its economy is based on the corporate form of ownership (Hogan, 1998, 4). The reason is pretty prosaic and has nothing to do with any ideology - simply, domestication of its huge territory, mostly in the zone of extreme climate, previously beyond the reach of the farmer, hinged on building an elaborate infrastructure based on technologies of its time. As private property depends on timely returns, such super long term and super massive investments had to be funded by the state through collection of taxes. Along with the New Deal, similar government-funded great programs also took place in the other large states of the era, regardless of their ideology, including the Nazi Germany, the Bolshevik SU and the Capitalist US.

The practice of state-funded capitalism continues and even grows nowadays (gradually morphing into “crony” capitalism). Massive subsidies and state funded contracts support agro businesses and large corporations, such as Halliburton, Lockheed Martin etc. The Republican administration overdid the Democrats in expanding budget deficits and spreading around the “pork” and “earmarks”. Of course, state funded capitalism is not the only or even the main form of ownership in the country, created to efficiently collect the funds of its affluent middle classes and funnel them towards financing its great corporations. The stock market works much more efficiently. This unique American invention created a brand new object of ownership - public companies, whose stocks are freely traded at the open market. Note that before the 1848 Gold Rush, which provided the initial investment, companies tended to be monopolistic and used to operate under crown or state granted charters.

As we see, a shift of growth to a new zone leads to a cascade of unpredictable and quite painful changes in

nearly everything. The first half of the 20th century followed the persistent pattern well established during the previous historic eras, as it lived through a series of dramatic crises, including the two world wars, which some historians consider “the European civil wars” (Roberts, 1996, 411). The rise of the mass classes was accompanied by rapid urbanization on the background of erosion of the 19th century’s financial system based on the “golden” pound of sterling. From the start of WWI and, possibly, even as early as 1913, its highest point, the British control over the global trade rapidly wore down, taking along the entire system of British style laissez fair capitalism. Lacking a complex system of state regulations and oversight companies strived to create and uphold a monopoly, expressly forbidden in the later period. As shown by Roberts, a prominent historian of the period, between the two world wars there was also a pronounced shift from the coal economy to the one run on oil (Roberts, 1989, 379).

A war, homologous to WWI, took place at the start of each of the 6 historic periods – mutual grudges and tensions escalated with the growth of inelasticity of the chief energy resource of the passing era. However important, this was just the political half of the war equation. Its other, techno-economical half may have been no less crucial. The first war of a young coenosis served as the incorruptible judge, choosing the very best technology out of a long list of contenders. This technology, such as the internal combustion engine, speedily refined during WWI, out of the reach of economic constraints typical for the time of peace, would assist in domesticating the next geoclimatic zone. Meanwhile, the older power structures ended dramatically weakened during the war-related bloodshed, which also armed and empowered new social strata of the former underdogs. As we, pushed along by the growing inelasticity of oil, gradually move towards a homologous period of time, there is urgency to learn the lessons of the past, and, if possible, use them for devising ways for alleviating this disturbing sequence.

CREATING A NEW FORM OF OWNERSHIP

Repeating the typical pattern of a shift of growth to a new zone, today we witness the start of regionalization, also pronounced at the dawn of the 20th century. Germany, which acutely depended on strategic resources then controlled by Britain, turned into its era’s troublemaker, while the US greatly increased its productive capacity. Nowadays, trying to resolve growing trade imbalances, countries increasingly go their own way, search for safe suppliers, fashion-out regional and bilateral agreements, at times with recent enemies, such as India and Pakistan or “pariah-states”, such as Castro led Cuba, Lukashenko of Belorussia, Chaves and Morales. Regionalization and the rise of the so called “block politics”, which historically was blamed for WWI, isn’t an evil plot. It arises spontaneously and naturally. The economy and political institutions of

the older dominant are, at that point in its life, dependent on its inelastic energy resource. They are specialized and thus rigid and inflexible, as was evidenced, for example, by the continued churning of SUVs by the US auto-makers as the world embraced fuel-saving cars. Gradually, this model is being discontinued, under the pressure of the US government, just as fuel-sipping cars may already be passé. In fact, it is easy to foresee the future reversal, serving the needs of domesticating the territory of the developing world, in the need of workhorse cars, from minivans to small trucks, perhaps run on cheaper fuels, such as natural gas. In this climate, the regions less dependent on the US-style car-based infrastructure would naturally tend to develop their own local adaptations - an attempt to make a better use of their environment, while also compensating for its deficiencies.

As newer centers of growth gradually appear, it becomes evident that the US -style liberal economy can not be applied to a number of countries, and not only in the emerging world, but also in Europe and Scandinavia, whose strong public sector counterbalances the ongoing erosion of 20th century- style mass employment and even manages to soften the current crisis through the use of extensive programs of social security for the unemployed.

Privatization of public property in the US created a slate of its own problems - ranging from the crisis of excessive financialization to difficulties of modernizing its expensive infrastructure, including electric generation and distribution, permanently clogged roads etc, since this can not be justified from the profit-based standpoint. The ongoing erosion of fundamental research along with such organizations as NASA, while 45 million + Americans lack health insurance, potentially reduces the defense capacity of the country. It has ever fewer people able to design and build a complex system - as estimated the retirement of the baby-boom cohort may depopulate the leading centers of defense. The traditional liberal economy of free market also encounters its share of problems as manufacturing is being outsourced abroad. The government grows into the largest consumer of technology, the source of lucrative contracts, financial and legislative largesse, military and political protector of financial interests abroad... This reduces the competitiveness of industry, which becomes dependent on government largesse handouts.

This emerging model may be tentatively named "bastard"-capitalism, homologous to the well-known historic period of "bastard"-feudalism. Closer to the end of feudalism, as the cost of life grew and the size of an average manor shrank, its subsistence economy could not feed a knight anymore. Meanwhile, the rise of commoner foot soldiers, from Welsh bowmen to Swiss lancers to early cannons created a need in expensive plate armor. The knight had to rely on monetary remuneration coming from his suzerain and, at the end, from the king. The king paid for his army using taxes self-imposed by the towns on themselves. In its turn, this led to an increase in monetary exchange and market economy causing a rapid

growth of the said towns. Today, the ongoing expansion of state orders and contracts is paid for through the explosion of double deficits: of budget and current exchange. In the fashion of the medieval knight, many corporations, especially the larger ones, lost the ability to self support themselves on the free market and to a great degree grew dependent on taxpayers.

Historically, "bastard"-feudalism presented an intermediate form. As a rule, such endgame hybrids, neither here nor there, point at the major pathways of the evolution. For example, the national states of the Age of Exploration, next after the feudal era, were based on the growing commercialization of towns. Since this pattern held already 6 times in history, at the start of each coenosis, it can be safely assumed that it may hold in the future as well. This means that the public form of ownership, increasingly important for the modern US, as the basis for its other forms of property, including private, corporate and communal (municipal or not-for-profit) may grow into the basic form for the next coenosis, shaping a unique economy of its own geoclimatic zone rich in its special energy resource.

Even though there is usually a strong genetic relationship between the old and the new, the basic form of ownership within the new coenosis tends to differ from anything known before. For example, the guild-based form of ownership prevalent in medieval towns hardly resembles the charter company of the Age of Exploration even though they are directly related through the town and its economic and political institutions. The rising form of ownership rarely boils down to re-carving the older property, but, as it was said above, involves appropriation of something totally new, which, kind of, did not exist before. For example, the swampy loess soil of the first civilizations turned valuable only as greater population densities enabled canal building and maintenance.

Obviously, at the start of a new era, such new property is rarely abundant, since it has to be first appropriated from nature. That is why a new era usually starts with a war, WWI style. As people fight to carve up the heritage of the previous era, they also test and refine the up and coming major technology - a fundamental invention (Killer App) of its era - for domesticating the next zone.

Our conjecture about public property as a possible basic form for the next coenosis is supported by the extreme character of the next geoclimatic zone. Its domestication may hinge on substantial investments into the basic infrastructure with uncertain perspectives for returns. It can not be excluded that communal holdings in the fashion of kibbutzes, municipal-sponsored ventures etc may become essential for growing more food on desert, mountain and other extreme lands which can support a few or none auto roads. Their future decentralized and affordable infrastructure may be based on electronic communication, air-based transport, micro-generation using small but various and numerous local sources of power (streams, windy hills, sunlight). Economically, all of the above seem well within the reach of local communities.

The growing shortages of arable land and fresh water may push forth technologies of creating artificial habitats, both borrowed from the past and based on futuristic technologies. For example, the manmade "black soil of Indians" (terra preta do indio) of Mesoamerican civilizations prior to the 16th century greatly improved the productivity of Amazonian Ferralsol soils known for their low productivity, while also providing long term sequestration of carbon. Similarly, modern practices of manmade atolls and new forms of ownership on wild fish in the sea greatly increase the time horizon for a fisherman motivating him/her to maintain sea productivity (Pressman, 2006). Israel pioneered the drip-irrigation and other promising desert farming technologies. Obviously, technological advance depends on appropriate social measures. J. Stiglitz, a Nobel Prize winner, proposed a number of intriguing approaches, such as taxing carbon emissions, institutionalizing bankruptcy proceedings for sovereign countries, liberating medical innovations from patent protection by using instead one-time bounties, creating stabilization funds for resource supplier countries, and, finally, re-introducing the Keynesian idea of universal currency to replace the globally subsidized US dollar (Stiglitz, 2006).

A rising panoply of communally supported forms of ownership would have little in common with its historic predecessors, such as the central planning, introduced within the grand programs of the 1930s in states with different ideologies: the US, Germany and the SU. The latter is usually considered representative of public ownership, which is then, by extension, held liable for all the excesses of that time. It is worth remembering though that this older form, mislabeled as public property, had nothing to do neither with communal holdings nor communal responsibility. Instead, they were rather aimed at funneling taxpayer-provided funds into the state-corporate form of ownership (Hogan, 1987). The public ownership of the next coenosis might significantly differ from that, the medieval guild differed from the charter companies of the Age of Exploration or, to that matter, from the modern stock market.

SOCIALIZATION OF OWNERSHIP – A LONG-TERM OUTLOOK

Socialization of various forms of ownership, from private to public, implies their active role in increasing the sum total of its community's wellbeing. Historically, drastic shifts towards a new form of ownership tended to start inconspicuously, on a small scale, pushed forth by fringe players. Today, for example, as the traditional tax base shrinks, such unlikely actors as municipalities slowly morph from tax collectors into full-fledged economic subjects by undertaking low-cost/high-return activities aimed at reenergizing the local economy.

Adam Smith discovered the promise of new forms of private ownership, which were based on appropriation of land "enclosed" from peasants. At their start, enclosures

brought massive suffering as peasants lost their source of livelihood, but ended up by significantly increasing the total amount of food grown in Britain. This was translated into the wild success of its coenosis. While French radiation slowed significantly - in France private land ownership has never been quite embraced - the British radiated all over the globe buoyed by coal based technologies.

Today, just as it was the case in the late 18th century with the state sponsored charters, the economy based on corporate ownership seems to be approaching its natural limits on many fronts. Titans of capitalism lament that the ability to outsource abroad and freely roam between countries pursuing any short-term gain, drastically shortened the corporate time horizon. Corporations that used to stake their future on their country's prosperity and led the society in unpopular altruistic acts such as the Marshall plan are forsaking their patriotism for the ability to grab a quick "buck" abroad (Peterson, 2004). When not checked by strong local groups, large corporations are known to be ecologically reckless. That this refers to the corporate form rather than capitalism per se is proved by similar problems of the state (corporate) socialism - in the Aral Sea's ecological disaster the interests of the local peoples were sacrificed under corporate pressure... Meanwhile, the western lifestyle faces a systemic limitation - according to the warning issued by an environmental group WWF (World Wildlife Fund) if the world's population shared the UK's (never mind the US's) lifestyle, three planets would be needed to support their needs.

As the older forms erode or reveal their limitations, new, much more complex hybrid forms of ownership are showing up. Among them, public-private partnerships may be combining the strong features of both partners: accountability and long-term horizon, respectively. The private part runs the enterprise in a businesslike manner, allowing it to retain and motivate professionals, while the public part is aimed at nurturing new groups of owners, who have both permanent interest in their locality and the ability to choose and fund pertinent long-term projects.

As it was the case at the Smith's time, both the erosion of the older forms and the growth of the newer ones are fueled by technologies, first and foremost, the Internet. On its "Mr. Hyde" side it enabled the outsourcing eroding thus patriotism and time horizon of corporations. On the "Dr. Jekyll" side, it made it affordable for smaller/non-profit entities to step into the void left by the exit of the larger companies. Airlines can lower their costs by selling tickets on the Internet. Towns use the Internet to market their cultural activities on the cheap. Internet based interest groups and the blogosphere show their muscle through fund raising and candidate promotion.

In the lifespan of a rising coenosis, this is the time of the appearance of new producents - a biological term for the producing strata of a society as opposed to its no less vital control level of consumers. In its time, large agglomerations of people in the emerging towns of the first civilizations led to the rise of the irrigation agriculture-jointly they had the muscle power needed for digging ca-

nals. Similarly, today, we are witnessing the dawn of a homologous event, which, in the future, may be of no lesser magnitude. The Internet enables accumulation of large reserves of intellectual power, bringing in such phenomena as the “open source” software, wikis etc. An “open-source” community, still young, awkward and inexperienced, lumbers in as an 800 pound gorilla holding the potential to trounce any old-fashioned corporation. In the past, the high human density enabled the rise of the first civilizations. Today, the yet unknown future functionality of massive intellectual online power buildup is anyone’s guess. If history is any guide, its consequences may be no less drastic and its advance can be no better stopped by any old-fashioned interest group, including recording studios etc than a moving train can be stopped by a twig.

Meanwhile, the relentlessly growing “footprint” of humanity puts additional demand on the planet’s mineral riches, greatly increasing their potential value. A far-off locality’s mineral and other resources used to be carted away by outside groups with little oversight from its corrupt leaders. Currently, they are being reclaimed by increasingly vocal native groups, who are their motivated owners by the birthright and whose very survival depends on the careful long-term husbandry of their territory, with future forms still in the early formation stage.

As old-fashioned resources rapidly grow in value, giving a new start to the emerging world, where most of them are located, new kinds of property are created each and every day, including but not limited to popular sites, radio frequencies etc. At the same time, cheaper air transportation and affordable mobile communications change the very geometry of our living space, which is typical for the time of a shift between historic eras. What was far away becomes close by, easing domestication of a much larger emerging zone. For example, the mass car increased the range of a day travel for the motorized farmer to 100 miles from merely 10 of the earlier horse rider. Similarly, the Pax Romana encompassed a huge area made passable via excellent Roman roads. Such sudden expansions aren’t entirely benign. Even if the size of the British Empire grew with the reach of its gunboats, it then easily outgrew this middle sized country’s ability to hold under its rule the entire world made accessible by the steam... Today, we witness a similar high-tech driven challenge to the current dominant, the US. Among the more benign developments, rural Kenyans use their cell phones to check market prices then take their product to the high est bidder. This already led to a rise in the GNP (Eagle, 2003). According to some estimates, no dictator -ship is possible as soon as 20% of the population own mobile telephones. This was underscored by the recent events in Iran. Africa is fast approaching this threshold, as does also India and other emerging countries.

Technology both determines the geometry of the rising region and helps in forming its social institutes. The bureaucratic state of the first civilizations was called to life by the huge expense and complexity of building and maintaining canals and dams, beyond the reach of any

individual. The 20th century’s mass occupations serviced the centralized infrastructure of the time: roads, electric transmission and generation..., based on the corporate form of ownership dominant in all major states of the era. Today, the rising technologies enable decentralized affordable infrastructures on many levels. This includes cheap air transportation; even cheaper medium -distance bus travel and train freight. Local manufacturing and agriculture, with staples farmed in the close vicinity, may potentially reduce both the volume of freight and the shelf-life of products, in contrast to the current, US-style long distance transportation of standard products with long shelf lives. Meanwhile, micro electro stations would be utilizing local sources of power; enabling affordable mobile communications in the most remote regions of Africa devoid of traditional infrastructure. Along with all of this would come new types of entertainment, distance or “tele”-medicine, distance education. In the base of this development would be democratization of scientific research, carried out by smaller groups out of the traditional narrow framework of universities etc. If history is any guide, after becoming technologically feasible, these new forms will break through any resistance, inasmuch fierce, from the older entrenched interests, calling to life brand new feeding chains able to domesticate the complex environment of the emerging world, from Asia to Africa. The erosion of the older centralized structures is already more visible, while the smaller groups committed to the long-term wellbeing both of their localities and the entire planet are getting more vocal, supported and connected through the Internet and such evolving global bodies as the UN. It is not entirely benign though - terrorist groups are also small and are challenging the much larger states, an ability gained through emerging technologies, with flexible organization enabled by the Internet. This also contributes to the rise of small private armies, a trend, further reinforced by the shrinking tax base of the modern state, unable to pay for a mass army. This was underscored by the heavy use of military contractors by Pentagon. It is impossible to foretell the exact shape of the future basic form of ownership and social institutes supporting it. However, the cited trends give an early taste of their unstoppable power

A SHORT-TERM OUTLOOK: OIL AND FINANCES

In the 20th century, after 1913, the accelerating crises of the “gold” pound sterling dramatically weakened the British global trade system based on this universal currency. If history is any guide, a similar malaise can also be expected for the American dollar-based global trade system within the next 10 - 25 years. Today, despite the growing competition from other currencies, including the euro, the global trade is run on the petrodollar. Ironically, as long as it is paid in dollars, the higher the price on oil, within the bearable limits for world economy, the better for the US, an oil importer and debtor. Up to a limit, the dollar re-

serves of other countries both stored in their state banks and bought from the US for the needs of the global triangular trade mentioned above help to support the country's high life standards despite its shrinking real production and disappearing manufacturing sector. Within the economy of double deficits, the country lives on credit, as dollars flow out of its mints for servicing the global trade.

Thus, the modern financial system continues to be supported by the dominant inelastic energy source of our times, which is, still oil. This means that the future substitution of oil as countries reduce their oil consumption may, in an unexpected side effect, harm the current dominant and the system of the global trade maintained by it. The same happened at the start of the 20th Century. The 1913 inflationary crisis related to coal coincided with the apex of the British power before the collapse caused by WWI. Britain owned and maintained the global network of coaling stations, irreparably damaged during WWI, after which there was a pronounced switch to oil economy. A similar switch from the current oil economy carries the same danger of creating vacuum of power. The US is already overstretched in its role of the sole superpower, the guarantor of global trade and finance. Its financial weakening may lead to considerable escalation of existing global tensions.

A future shift in a dominant resource is not a far-fetched possibility. Among countries, rich in alternative resources, Brazil and Iceland are already switching to local energy sources, sugarcane for ethanol production and geothermal energy used for producing hydrogen, respectively. Worldwide, there is a notable surge in natural gas uses, which may be a step towards utilization of methane, a by-product of immense waste accumulation within the Industrialized world.

Repeating the path already taken by the coal economy in the first quarter of the 20th century, within the next 15 - 25 years we can expect an inflationary peak followed by a drop in oil prices as the world gradually switches to more economical and abundant energy sources, first and foremost, based on natural gas, methane and then, possibly, hydrogen. This happened a century earlier with coal, with the peak of its volume and price around 1913, and a gradual shift from it after the 1920s. Ironically, even as energy use grew, the price and volume of coal were falling (Roberts, 1989). The shift from coal to other energy sources, most notably oil, was not related to its scarcity - coal is plentiful up to this date. However, as its mining and global infrastructure of coal retrieval and delivery grew more expensive, countries had to reduce their coal consumption substituting it with their local energy sources as the rising technologies made it feasible.

It is hard to pick out the next dominant inelastic energy source out of a bevy of promising alternative sources. Even though the internal combustion engine was refined during WWI, up to the 1950s, it was rather hydropower that stood out among potential coal substitutes. Oil was used mostly for transportation. The US was the first and essentially the only country of the 20th century that fully based

its economy on the mass car of its Detroit-Texas backbone. Similarly, during the Industrial revolution, Britain grew into the global dominant based on coal economy and started to lose its positions after WWI. This process was finalized by WWII.

In its turn, the US grew on its own unique resource, oil, and may lose its dominant position with its growing substitution. In no way does this mean that the Oil Age is already passé. Before the fall in oil's price and volume there may be about 10 - 25 years of growth, while it may preserve a vestige of its former strategic importance for a quarter of a century thereafter. Further development of oil production for the exporting countries seems rational, as long as they invest their profits into advancing alternative energy technologies, while also nurturing long term partnerships with their consumers. Ecologically sound technologies seem especially promising. Besides furthering preservation, they may also have a greater export potential.

A new paradigm to help domestication of the emerging world must be developed, more appropriate for its innate geometry and fragile ecology, whose mountains and deserts do not seem too inviting for a dense network of auto roads, US style. The example of the New Deal shows that the basic infrastructure for a new zone, which, by definition, must be unlike to anything that existed before, tends to be built in one huge effort. Contradicting the currently ruling creed of the relentless pursuit of profits, the rural electrification of the US was underwritten with tax-generated income within the programs of the New Deal, which were less concerned with earning returns than with creating more jobs. Cheap rural electricity allowed to irrigate the Corn Belt with water pumped out of the Ogallala aquifer. This curtailed the ecological disaster of the Dust Bowl, while significantly increasing food production in the US. The construction of the highway system was carried out as a federal program during the post WWII Eisenhower administration. Just as the 1930s German autobahn system, which it copied, it was done mostly for improving the country's defense. Such projects, including also the Marshall Plan, which proved to be essential for unifying the western world while also creating ample markets for American products, demanded significant foresight, sacrifice of short-term goals and longer time horizon from business and political US leaders (Peterson, 20-04). This survival-minded scenario seems to be fairly typical at the start of a new coenosis, which, by definition, brings in an increase in imbalances, mutual grudges and arms race thus consolidating and motivating the population.

And the last but not the least - the rise of new models of production: low-impact, resource-saving and labor-intensive, in the manner of traditional eastern-style; but also technologically sophisticated and able to resolve the most important bottleneck of the modern manufacturing. While the modern machinery makes it easy to produce basically anything, the current model of production leads to huge expenses at the design stage - hundreds and thousands of standardized parts must be minutely designed, up to the tiniest detail, thus producing volumes

of technical documentation and specifications. Meanwhile, the new style of production, based on the revival of the traditional institution of communal cooperation, may be already forming a nucleus of a new technological style for our future. It might lead to immense simplification at the design stage, since only basic modules must be specified, with minute details left to the discretion of suppliers.

We tentatively name this emerging style the Object-Oriented Design (OOD). Its roots can be traced both to West and East, as it merges their best and latest trends. Using OOD it became possible to greatly reduce costs of production by sidestepping the super expensive stage of a new product's design. This is hardly an academic concept, as this method is already hard at work. Its possibilities are showcased by the success of Chongqing and its production of super-cheap motorcycles. A similar model of production was also attempted by Boeing as it tried to speed up the manufacturing of its revolutionary Dreamliner. This new organizational model feeds on the communal traditions of the densely populated East. Also, it requires substantial technological sophistication, which became possible with the help of the Internet and the ongoing miniaturization of technologies through the use of the chip, developed on the West. Thus, it marries the best trends of West and East into a new line of development, which carries the latent potential reminding one of the Model T of Ford. Just like the latter, it may become essential for unlocking the hitherto underdeveloped territories by providing cheap means of access to them. The affordable mass motorcycle comes along with the internet, cell phone, alternative sources of energy etc, which, in turn, are reminiscent of the telegraph, the radio and the light bulb a century ago.

This important new business model was initially developed in Chongqing and is now being spread to other regions in China. In Chongqing, the current world capital of cheap motorcycles, cost savings were achieved by a significant simplification. There are no detailed specifications for a part other than inputs and outputs that allow it to be compatible with other parts of the end-product. In fact, any wheel will do, as long as it has appropriate coupling, and acceptable weight and quality. The same applies to any other part of a given motorcycle. This unorthodox approach appeared as a product of tight initial financing, which was resolved by the mutual cooperation of artisans, who lived close together and trusted each other. Chongqing grew into an important business and finance center.

Meanwhile, this practice also eerily resembles the most advanced techniques in computer code writing, the Object-Oriented Programming (OOP). The entire code is a collection of largely independent modules, which may be reused at one's will. Only inputs and outputs of these independent modules may be controlled, everything else is "hidden" inside the module. This approach enhances both the flexibility and reliability of the code and shortens the time of its development. By extension, the Chongqing business model, which lowered costs dramatically and ena-

bled the mass production of cheap motorcycles, may be rightfully called the Object-Oriented Product Design (OOD). In China, it is being actively deployed also in other industries, including such as the production of advanced solar-cells. The main principle is a town devoted to a single product, with all suppliers housed close-by, within each other's reach. It closely resembles medieval artisan guilds while being embraced by other industries and other towns.

THE RISE OF SOCIALLY-ORIENTED FORMS OF CAPITAL ACCUMULATION

Just like it happened in the past, today, there is already an alternative financial system, seemingly little affected by the ongoing crisis. The awakened periphery responded to the pressure of the dominant by creating local forms of capital accumulation. This process started quite awhile ago. For example, after nationalizing the Aramco during the Oil Shock the Saudi government had to run it, having neither trained personnel nor appropriate financial structures. From the 1950s, Aramco found itself in the role of a quasi-governmental body, increasingly owned by the government. Among first expenses, a large group of Saudis, including al-Naimi, the current oil minister, was sent to Western universities. Both the source of funds and goals radically differed from comparable western oil majors, concerned with generating profits. Instead, the Saudi government strived to take over and run its oil industry, creating, in the process, a source of wealth for the kingdom – a public good for its citizens.

It is hard to pigeonhole the new entrants, quite a mixed bag: including the faded Japanese keiretsu and the Korean chaebol, along with all kinds of national monopolies: Aramco, Gaz de France, Electricite de France, Gazprom etc. Add to this the rise of socially responsible mutual funds, specialized charity organizations (Bill and Melinda Gates Foundation etc) and a veritable smorgasbord of community groups: hippies, Afghan Mujahidin, internet-based groups etc. The novel social-bonding and funding schemes tend to function as public-private partnerships in the West or sovereign wealth funds etc outside of it.

Among them are such strange animals as economically active municipalities, sponsoring local airports along with low-cost Wi-Max communication systems. Such uncommon activism is predictably resisted by private companies who accuse the towns of unfair competition and fight them in courts, often successfully. Communities meanwhile have their economic raison d'être - it is so much cheaper to sponsor a business infrastructure to boost the local economy and the employment, than pay unemployment benefits.

Despite differences, deep-running mutual suspicions and, occasionally, ideological warfare, all these new models exhibit a clear unifying thread. They are socially-oriented and community-based, as opposed to multinational investors, in the pursuit of profits not especially interested in

a particular locality/its needs.

In contrast, these emerging forms of accumulation with a social twist collect their funds for a specified purpose, to be invested here and now, in a chosen project. This presents an obvious heresy to the neoliberal orthodoxy, as these newfangled investors engage in the production of public goods - and pick their projects outside of classical market criteria. This raises hackles of the representatives of the neoliberal structures in the West, to whom such organizations as SWF look suspiciously politicized. These suspicions are not without merits, as they, at least in the potential, do in fact pursue clear social and, perhaps, even political goals, which fall well outside of the zone of traditional search for profits. Oftentimes, they may seem unsavory, but we should not forget that the robber barons of the early joint-stock company hardly were a better bunch. They certainly had little in common with the "responsible-corporate-citizen"-companies of the 1950s - 70s that took pride in their communities, but were replaced since with multinationals. Surprisingly, the current credit crisis brings similar patterns of unprecedented financial activism from the unlikely source, the republican-led US government.

THE RISE OF NEW COMMONS ON THE BASE OF ADVANCED TECHNOLOGIES

The best examples of this rising form marry public interest with private motivation. During his keynote speech at the 15th World Congress of the IEA (International Economic Association) Dani Rodrik of the Harvard University reported that, in the absence of Western-style law and business regulation, small Eastern businesses, for example, in Vietnam, rely on their traditional communal institutes. Instead of using official channels, unreliable and expensive, business owners develop permanent ties with their suppliers, financiers and marketers. They widely publicize the outcomes, both negative and positive. Rodrik assessed this as highly efficient. As pointed to him by one of the authors, this also resembles a very modern development, Internet-based self-policing developed by eBay etc for the Western marketplaces.

Today, an immense battle is brewing regarding the access to the knowledge industry. Will it be protected by the patent system and function as yet another property right? Or will there be a brand new economy able to resolve current shortages through harnessing a totally new kind of property-rights on intangible goods? Many noticed the difference of the rising internet culture from any other type of goods, and its role in creating virtual commons. Benkler (2006, 3) shows that an online culture with information shared freely could prove more economically efficient than one where innovation is encumbered by patent/copyright law, since the marginal cost of reproducing most information is effectively nothing. The commons-based peer production already enables collaborative efforts, such as free and open-source software and Wikipe-

dia, products of information-sharing. The immense productive power of such commons can not be matched by any company even as large as Microsoft. This is acknowledged by a growing number of companies, the IBM/Intel/Google..., joining the open-source community. Recently, the joint force of grassroots and online community groups contributed to the electoral success of Barack Obama.

Separately, the modern means of communication contribute to the productivity of traditional small businesses, with internet-based virtual commons rising in parallel with physical commons. In Kenya, small-scale fishermen or farmers find their customers by using mobile telephony, thus maximizing their returns, reducing marketing costs and also getting access to virtual ATMs and banks. In this way, virtual commons help in producing tangible goods and increasing the sum total of local public goods. In India, many villages organize around an Internet-cafe, a single computer in a rural store, to perform everyday activities: buying/selling, dissemination of best practices etc. The growth in efficiency of the most mundane business ventures in the far periphery of the developing world comes from the chip. Potentially, this ascending technology may compensate for shortcomings of a poverty-stricken, remote area, contributing to the rise of a rich range of novel business and funding schemes.

Those are just the early prototypes. Much is being said about the power of the Internet. Meanwhile, one should be amazed perhaps by the contrast between its relatively puny results and the mind-boggling potential. In a way, this resembles the early days of steel, with main uses still confined to the railroad industry. Similarly, Google, the company that single-handedly created search on the internet and may be on the verge of revolutionizing the world by starting a new, thoroughly democratized knowledge industry outside of the shrine of colleges, derives its significant income by servicing old-time advertisers. An average customer still mostly cares for a few services: a restaurant review, a download and an easy link to her friends. The immense databases created due to incredible affordability of storage/computing power are, as yet, mostly devoted to gathering data on ordinary citizens with the doggedness, not dreamed of by the past totalitarian states.

Meanwhile, the corporation is already losing its footing and depends on government's handouts. Lacking local roots, it may be replaced as the dominant form by much smaller and nimbler start-ups eager and able to earn pro-fits, while pursuing community-shaped goals. This would repeat a persistent historic scenario. At the end of feudalism, the knight army came to depend on king's handouts, funded by the rising early-industrial towns. Then, it was altogether replaced by the much cheaper infantry.

In no way do we suggest the disappearance of the classical "for-profit" enterprise. The opposite is rather true, as public sector is notorious for its inefficiency. In its best, new funding schemes presume public-private partnerships, where each partner does what it does best. In Me-

linda and Bill Gates foundation, the public (the foundation) takes on itself the immense task of forming goals, funding R and D and distributing the end products. The private enterprises, mostly small start-ups, work for profit in their area of expertise, thus reducing the waste, usually associated with government. In the same fashion, the open-source community entrusts the commercialization of its products to for-profit companies: Red Hat etc. Even the Aramco employs private oil-service companies, such as Schlumberger, and pays for their expertise, while preserving sovereign ownership rights. Likewise, the Iraqi government prefers fee-for-service agreements to PSA contracts, as they don't infringe on Iraqi ownership rights.

Today, the Internet seems an industry on the verge, searching for truly productive applications, just as it was the case with electricity at the start of the 20th century, when people only cared for a light bulb and a radio. However, to get these nice amenities, they had to invest into everything else related, including spacious houses and daily showers, along with unpleasant side-effects, such as better tools for the two world wars.

UNLEASHING THE POTENTIAL OF FORMER BADLANDS

There is a reason for dramatic changes at the end of an era, described above: the dominant economy gets over-extended, along with the exhaustion of the arable due to over-farming, soil-degradation. Overpopulation, exacerbated by globalization, led to shortages. Their eventual resolution meant the introduction of new institutions geared at domestication of former badlands through a shift to a new economy, with its innovative and unique style of land-use. In a give-and-take, new mechanisms of fund-raising (further Accumulation Engine or AE, a concept introduced in (Badalian and Krivorotov, 2009a) solve the problem of creating new demand, while a better land-use provides novel supplies.

For example, in the early 14th century, huge overpopulation caused ploughing of marginal soils, with hardly any returns. After the 1348 Black Death, most of these lands were left fallow. As forests did not return, instead, there were meadows, for a new industry of animal husbandry. The early-modern period rose with the charter AE company and economy of the Atlantic bulk-trade - textiles and food-stocks with super -long shelf -lives: grain, salted fish, hams-sausages... The seafaring led to the conquest of the Americas.

Soil exhaustion/erosion was recorded at the start of other periods and is experienced today. For example, large tracts of the Shenandoah Valley were reforested during the New Deal, following fertility loss due to severe over-farming. The ongoing loss of both the arable and its productive ability is well recorded.

During the technological shift between periods the exhausted areas were usually left fallow. The lost capacity was more than compensated for by cultivating a new geo-

climatic zone, previously considered unproductive. With pressure taken off, the earlier agricultural territories gained a chance to recuperate. Today, the arable is still relatively small, about 11% of the landmass, leaving ample space for domestication.

Meanwhile, the exogenous limits of the expensive economy of petrochemicals are becoming clear, perhaps, preventing its further spread. The chronic diseases (asthma, diabetes...) of the industrialized world along with deadly blooms in oceans from agricultural runoff show its perils. Obviously, new technologies of raising the soil productivity are needed, including perhaps resurrection of ages-old techniques.

The challenge of living off marginal-lands was repeatedly surmounted in the past. Historically, there were at least 6 distinct geoclimatic zones, gradually more difficult for cultivation. Their potential was unlocked a step at a time, within a new type of land-use. After hard adjustment, the rising technological style, funded by its own form of ownership and the related Accumulation Engine (further AE), led to a surge of productivity of the former badlands, domesticated to feed many more people. Borrowing a biological concept, we define the new economy rising in former wastelands as a coenosis, a community of mutually dependent life-forms, organized in production hierarchies or "feeding- chains" (Badalian and Krivorotov, 2006), with bottom tier of "producers"/laborers, and the controlling upper tier of "consumers"/entrepreneurs, connected through infrastructure enabling production and distribution within hierarchical "feeding chains".

Historically, those financing-infrastructure schemes were surprisingly synchronized, with compatible styles of land-use for similar geoclimatic zones worldwide, despite dramatic social/geographic differences. That is, Hogan (1989, p.4) noted that both the US and the USSR, despite disparities, evolved into corporate states, perhaps reflecting the immensity of their size, and the scale of investments into infrastructure/production of the era. Similarly, the periods of Chinese history were notably synchronous to those of European history, despite dissimilarity of the related social institutions/economies (Fairbank, 2006, 47).

Perhaps, as soon as, under immense demographic pressures, there was a new, more suitable technology for domesticating some previously marginal territory, it radiated to others ASAP, to be realized under local funding schemes. Fragmentation at the end of globalization created both a window of opportunity and a need for new solutions, which evolved as regional versions of a worldwide scenario.

Badalian and Krivorotov (2008) showed that, historically, there were two preferred paths of land-utilization. In the West, each successor- economy was more powerful energy-wise. Meanwhile, in the East, best personified by China, up to the 1850s, output grew by increasing the level of precision of power-applications (Fairbank and Goldman, 2006, p. 16). Thus, either a more powerful or a

more precise version of similar technologies was used to domesticate a marginally-productive territory. In both cases, the scope and outputs grew manifold, supporting many more people.

Types of land-use evolved as follows:

1.) The system of land-use based on water-management: During the Bronze Age, irrigation-agriculture of the first civilizations evolved in suitable spots from the Euphrates to the Yellow River. Their egalitarian societies lived for a single goal - construction/maintenance of immense waterworks;

2.) Deep cultivation of the soil: The land-use system for rain-fed areas. The Iron Age enabled deep cultivation of rain-fed areas with light soils, using the hoe/plough and a variety of plants/tools. The olive/wine-based economy of the classical antiquity of Greece-Rome had its counterpart on the loess soils of the Yellow River. The deep-plough grain production was supplemented by gardening. Both systems were supported by compatible social/financing structures.

3.) Massive forest clearings: Due to a surge in iron-smelting, European forests could be cleared-off during the high Medieval Era with a similar development in the forested/swampy valley of the Yangtze River.

4.) Land reclamation of swampy/coastal areas: The early-industrial land-use system. The coastal areas, unsuitable for cereal farming, became productive within timber, wind/hydropower economy of the early- modern era. Its main technologies: early-manufacturing, bulk-trade and long-distance seafaring, including to the Americas.

The accompanying efficiencies of scale and specialization led to a demographic surge – the Chinese population trebled in two centuries (1650 - 1850). People were funneled to towns, now able to absorb and employ them.

5.) Industrial land-use: Coal in the industrializing Britain. The classic private company, A. Smith and laissez faire-style became the main tool for capital accumulation of the industrial period. The government promoted and protected trade interests, including fighting wars for markets (Opium Wars etc). Funded by the Smithian AE, the empire grew powered by coal and the so called agrarian colonialism. After exhausting cheap domestic resources, it reached OUT by building and maintaining a system of global trade and colonies funded by issuance of bonds/-bills-of -exchange. The rising demand awakened the periphery: the US, Canada, Argentina, Russia...

6.) Mass- production style of land-use: Currently, oil. The oil-based economy boosted the productivity of the US territory. This was funded by the joint-stock company, opening a much larger fundraising base than before. The oil-based economy radiated OUT during the ongoing globalization, sending funds and know-how to previously marginal territories, now important suppliers of resources/labor: from the Middle/Far-East to Russia.

Conclusion

History provides a valuable blueprint. Today, all components of potential future institutions seem present and waiting to merge into a viable whole. Those are:

1.) New socially-oriented forms of capital accumulation with a visibly activist agenda: from a sovereign wealth fund to a communal self-help group doling out micro-loans.

2.) New forms of private- public partnerships, with the public shaping/funding the goals, realized by motivating private enterprises working for profit.

3.) New technologies of the Internet and flexible production, enabling off-grid remote settlements and new styles of land-use on the far periphery. A brand new economy of small series may be needed to boost the productivity of current badlands - the Negev desert in Israel is already used for aquaculture and fruit-vegetable farming for export.

If well executed, the ascendant socially-oriented forms of accumulation may succeed in their main task - greatly increasing the wellbeing of local communities, regardless of short-term profits. This social goal arises from the need to live off poorer lands, often considered wastelands within the current mass-production economy. Similarly, the US rose to dominance by learning to thrive off the Great Prairies etc, unsuitable for the traditional farmer. However, even that immense task seems simple in comparison with the current challenge - the land productivity could then be increased by developing more powerful machinery. In contrast, the current badlands are extremely diverse, requiring customized approaches. They can hardly be expected to respond to the "one-size-fits-all" recipe of mass production, US-style. Thus, flexible solutions have to be found specifically for each unique location, contributing to the feeling of creating things "here-and-now" as a socially-oriented public good for a particular community rather than the entire humankind.

A Smith once famously said: "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages". Today, this reasoning may be extended to cover a locality, as its residents, pursuing their collective self- interest, create value out of things that were taken for free or misused/discarded before (Polanyi, 2001). Among them: ecology, access to knowledge, jobs and other intangibles forming the local wellbeing.

The remaining question still is: would these, currently disjointed components ever successfully merge to produce a highly productive socially-oriented AE for the developing countries, currently plagued with insufficient productivity. The answer may hinge on the future accountability of the major funding schemes on the rise, including the SWF, to their citizenry as opposed to the rule of auto-

cracy. It remains to be seen whether the future evolution of the current forms would lead to a novel AE; whether the latter would present a viable financial instrument to support the future technology-heavy development under conditions of global warming and other exogenous constraints of the current system, whether we would be able to avoid a major war. As we write it, nothing can be guaranteed yet. Only time will tell.

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