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Terminal Growth: What Are The Long-term Implications Of Our Drive For Efficiency?

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During the last several years, the world has witnessed profound economic change. Industrial economies, including that of the United States, have metamorphasized from postwar conditions of unparalleled economic growth, economic opportunity and expansion, into a state where global economic deterioration and instability plague the world and where the postwar days of full employment seem but a distant memory. Many economists argue that this is a cyclical phenomenon, yet they are unable to guarantee that a rebound will occur.

This article will attempt to demonstrate that structural conditions exist which are antithetical to a sustainable rebound and that, unless these structural issues are soon addressed, a state of perpetual unemployment and increased anarchy are likely to become ubiquitous features of our future world order. This article will show that, unless these forces are soon dealt with, they will increase in strength until their damage becomes difficult to reverse. Leaders of societies and their citizens should be encouraged to debate these issues and take decisive action now, while the opportunity to do so still exists.

As global competition has intensified in recent years, businesses have increasingly sought to bolster declining profit margins by improving their operational efficiencies. This tendency has been fueled by recent advances in technology and automation. What this means is that human labor is increasingly being replaced with the labor of computers and robotic assemblies. Simultaneously, managers are becoming more and more cost-conscious in designing their organizational structures. More attention is being paid to simplifying process flows, and thereby decreasing bureaucratization.

On the surface, all of these changes may seem wonderful, resulting in greatly improved efficiency and a heightened ability for companies to respond to changing market conditions. Our liberal trade theorists regularly argue that all nations will benefit if trade barriers are eliminated and each nation specializes in what it does best. This would seem to create a condition of allocative efficiency internationally.

However, the belief that these conditions will create a socially desirable end is an illusion. The problems occur in three principal areas: (1) the effects of increased integration of computer and robotic technologies by business, (2) the skill level of labor forces, and (3) the structure of the value chain in the global market.

Increased use of technologies by businesses will increase their operating efficiencies and profits in the short to medium term. It is easier and more reliable to manage computers, which do not take vacations or sick days, need overtime, or require raises, than human employees. Additionally, managers and strategic consultants, alike, are becoming better able to redesign work flows and create jobs that make use of such technologies. By simplifying information flows in a fashion that is easily assimilated by a computer, human employees are increasingly facing obsolescence in many jobs.

Automated teller machines (ATM's) are one example of how a process flow has been redesigned to replace the need for many human tellers in the branches of banks. Citibank, America's largest bank, has teller machines that allow consumers to deposit and withdraw money, transfer balances between accounts, print a statement, and even receive traveler's

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checks. How they do it, is physically quite different from the procedures followed by human tellers; however, the end product is comparable.

Will the day arise when we fill up our cars at completely automated gas stations, or buy our clothing and gifts from television shopping malls? The technology to do so exists today. What remains to be seen is how it will be applied.

But do we want all of this efficiency? Are we prepared to deal with its consequences? Is there such a thing as too much efficiency?

The drive for efficiency is a drive to increase or sustain the profit margins in an industry. It benefits shareholders and performance-based managers. Yet those individuals who are in jobs that are highly repetitive, operational, or process-oriented, are those who will be first replaced by such automated technologies. They will become unemployed. In banks, one sees operations units and accounting functions rapidly becoming computerized and downsized. In heavy manufacturing, from autos to watches, one sees robots on assembly lines. In retail outlets, one sees efficiencies in cash registers, barcode scanners, and computer-assisted inventory controls. These free up cashiers, stocking clerks and cause society to need fewer of them. Credit cards bring efficiencies to businesses and stores who do not need to devote as much money to accounting or bill collection. This means fewer cashiers, accountants, bill collectors and check-out clerks. This means fewer jobs.

Farmers have already discovered their obsolescence as the family farm becomes an anachronism in a world increasingly dominated by giant agricorporations using enormous combines and tractors, some of which are already remote-controlled. Planting, harvesting, and processing are now done with extensive use of machines, not people.

Yet these changes are also affecting middle-management. Well-paid Wall Street bankers and researchers are being replaced as database technology simplifies research and as computers replace accounting and money transfer functions.

Efficiency is that factor which propels mammoth retail chains into duplicating their corporate and retail structures internationally. McDonald's, Citibank, Exxon, Tony Roma's and Wal-mart are obvious examples. Manufacturing and purchasing efficiencies exist in producing large volumes. Such efficiencies are found in the mass-manufacturing and standardization of uniforms, burger-boxes, signs, hamburgers, checkout counters, shelving, and other countless products. Service efficiencies exist in advertising, training employees, and in centralizing accounting, purchasing, and legal affairs departments.

However, in order for such global corporate structures to be manageable, jobs are being increasingly standardized from site to site and country to country. Standard operating procedures and guidelines are increasingly developed for all but senior managers. Large retailers, commercial banks, and other service providers, assure that services and procedures are standardized from coast-to-coast in order to preserve their brand reputations. They fear the possible consequences of allowing non-senior employees to have broad discretionary decisionmaking authority, for fear that a discretionary miscalculation might harm the entire firm's reputation. So they create policies and controls in order to predict and preempt possible mistakes. Yet these policies can confine as well as control. As it is impossible to predict all future moves that employees or customers might make, there will always be a tendency for situations to arise which do not easily fit the confines of established policies or controls. Yet forcing preprogrammed responses onto the employees not only causes them to lose potentially useful learning curves, it also causes the consumers' needs to be less well-addressed. Control policies tend to force larger firms to produce more of a generic than custom-tailored product. This not only reduces the ability of such employees to express creativity, it also causes skill lock-in, particularly as corporations increasingly tend to cluster around their existing technologies. One becomes an expert at functioning within one company's structure.

One may perfect a job in a particular corporate structure, but these skills may not be easily transferable to another environment. Should the environment change or the corporate

structure unfold, these structure-specialized workers may well have great difficulty in adapting to a new environment and in competing for these jobs. Furthermore, they will find that they are competing with recent college graduates, who although lacking skills for these jobs, may have a competitive advantage due to willingness to work longer hours and accept less pay (no families or lifestyles to support). On top of that, lifespans are increasing, hence people are staying in the labor force longer, both because they are able to and because they have to earn enough savings for a longer retirement. This only helps to add further competition.

Where does this put the hardworking familyman or familywoman? What effect will the increasing displacement of these individuals from the workforce have on the family structure of our communities? If these folks are unemployed, how will this effect crime in the community and the upbringing of the next generation of our society? What will be the effect on childraising if low salaries necessitate two-income families, a growing tendency in our own time? What will be the effect of an increasingly structured environment on our workforces' ability to imagine? To what extent will they be dehumanized by functioning in a structured environment over which they can exercise little individual control, a world of routine and procedure? In the era of mammoth mergers and corporate consolidations, more and more individuals are finding that they are entering such mass-production structures.

Does not similar structuring of working environments limit choices and variety in the pursuit of intellectual ideas by employees? Does this not reduce the collective diversity of our society? Is Marx's nightmare of the dehumanization of the workforce a closer reality? Are we turning ourselves into production machines?

Consumers, too, suffer a similar loss of diversity, as mass-market production decisions, being less individual-specific, limit the choices and diversity of goods and services available. Allocation and inventory decisions are usually made in a central location far from many of the end-of-pipe users.

Even small startup firms are reverting to a heightened emphasis on technological solutions for higher profit margins. In fact, many such small firms achieve their competitive advantage by being agile enough to beat larger corporations in the implementation of such technologies. Technology is not only cheap, it is plentiful.

Eli Whitney pioneered the concept of interchangeable parts in the Industrial Revolution. His idea allowed manufactured goods to be produced, with the help of machines, in greater quantities and at lower prices than had been available previously. Broken devices could be easily fixed and broken parts, easily replaced. Yet the corporatization of our industrial structure is doing exactly the same thing to its human parts. As jobs become more and more standardized, this means that they are becoming increasingly like Whitney's interchangeable parts. This means that they may well be simplified to such a degree, that if they are not replaced by machine or computer, they are likely to become subject to a commodity pool of labor. This would result in lower wages for these jobs, longer hours, and virtually no job security for these workers, who become easily replaced.

This is fueled by the tendency of corporations to cluster around their existing technologies. When a company invests in expensive computer or technological systems, it tends to routinize using these systems and tends to structure human jobs *around* the system's deficiencies: people do what the systems cannot. Employees thus become tied to a machine and the machine's abilities. The net effect is a decreasing value for the human's abilities and a race for redundancy as the systems' abilities improve. As man becomes reduced to mortar between the bricks (systems) of technology, the outlets for many of his creative impulses have vanished from the workplace. He no longer exercises much flexibility in structuring the environment around him: he must accept it highly prestructured. Much of his imagination is never allowed to leave the starting blocks.

Super-efficiency breeds competition; competition breeds competitiveness. Do we want to live in such an environment? What will this do to our "free marketplace" of ideas? Are we approaching a course where our world will be grouped into a large group of unemployed, a group of underemployed, a commodity pool of labor, and a small elite group of managers?

Today, we appear to have an enormous pool of labor that is dangerously approaching obsolescence. This includes a large group of younger citizens, particularly in urban areas, who may be one of the most uneducated and unskilled in generations. They lack basic skills in math, science, reading, and writing, and have some of the lowest test-scores in recent decades. They are obsolete even before they have begun working. Today, they float in and out of low-paying fast-food, restaurant, and retail jobs. Tomorrow, if these jobs do not exist, what will happen to them? We already see a pronounced increase in crime by these demographic groups. Even if the present generation were to stop reproducing now, society still has the burden of dealing with the existing millions through their lifespans. Will a fascist state have to rise to cope with the problems of increased crime and violence by a group that sees no opportunities? Will a socialist compromise be the best answer? We need to discuss these questions now. We cannot expect an increased service economy to save us as the largest service industries of banking and insurance are not only being attacked by foreign competition, their transactional nature also makes them one of the easiest to integrate with computers.

What about educating our workforce? What about job-retraining, so much in vogue with today's politicians? The problem is that with better automation, computerization, and industrial design, we just may not need that many people working. The ones that will be consistently needed are the ones who have the abilities to create these structures, yet even these needs have limits. Not everyone can be a scientist, a strategic planner, or a production engineer. We are rapidly approaching the situation where the world will have many more people than jobs. Even with great schools (creating them is only a small part of the battle), the need for humans is decreasing rapidly.

There is another education-related concern that we should have and that is whether we even want our schools and universities to focus more on producing graduates for the work force, a direction being called for by many governments. This would essentially allow market forces to dictate much of the curriculum of academia. This may well create an academic environment where producing graduates with specific market-related skills becomes paramount. Yet a bias would be created for meeting *present* market demands, not for creating skills that may prove to be useful to society in coping with unforeseen *future* problems. Will liberal-arts classes in philosophy, theoretical physics, and poetry become increasingly replaced with classes that serve business? It used to be that individuals went to college to explore different facets of the universe and human history and only once they began working, did they begin to study the pragmatic needs of business. Now, they can no longer rely on their companies or their work to provide this training. But do we have to sacrifice the quality of our liberal arts colleges in order to provide what companies no longer do? If our schools become task-oriented instead of philosophically-oriented, this will only decrease the diversity of our society and make humans more closely resemble interchangeable parts. This may also reduce our collective imagination and ability to react to change. Corporate research grants already direct much university research in the sciences. What happens if we allow corporate dollars to expand their influence on our campuses?

Might academia already be in jeopardy of intellectual stagnation by virtue of its own rules and standard operating procedures? In recent decades, universities have increasingly begun to resemble the guild structure of feudal times in its selection of faculty. It is a virtual, sometimes official, requirement at many universities that a professor attain the degree of Ph.D. before garnering a post. Most academics have never had any full-time working experience outside of academia. The culture frowns with skepticism on individuals who have taken a

different path to knowledge than that conventionally followed. This decrease in adaptability may well be turning our institutions of higher learning into rigid structures, intolerant to new approaches, at a time when they are most needed.

The increasing departmentalization of universities may also be antithetical to novelty, which often evolves from efforts that cross departmental boundaries. Tradition has resulted in the carving up of the study of the world into different departments (categories). However, none of these categories by definition is an optimal mode of approach. Political concerns, as well as the practical concerns of getting research grants, often discourages faculty from studying too far from the mainstream of their departmental field. Additionally, faculty, chosen from similar backgrounds and experiences, and isolated from the non-academic world, are likely to have diminished environmental feedback that might create more adaptable and descriptive approaches. Departmentalization, a guild structure, and isolation from outside forces, all combine to give a quality of interchangeability and inflexibility to these scholars who directly influence our future generations.

Last year, IBM developed a technology able to create microchips at the molecular level. This means that future computers may well be developed that are more powerful than what currently exists and so small that they cannot be seen without a microscope. This will likely allow development of microscopic computers or programmed robots that can be injected into the blood to fix cell damage, or into computers to affect repairs. It will also allow computers to do far more than they do currently. Even if current technology were to stop its exponential growth, our devices are already sophisticated enough to pose a threat to most human jobs. Over the next few years, we should expect an influx of systems thinking and computer literate managers to find ways to in which to increase the integration of these technologies, hence affect an increased displacement of human jobs.

In the last century, we have seen the world broken into a realm of industrialized countries, those that are less industrialized, and those that are not. The non-industrialized countries tend to produce raw materials, which are not high profit goods, as many nations can produce them. The industrialized countries tend to produce high technology goods and services, which have high profit margins as they require highly educated labor, a commodity not available in many countries. The less-industrialized countries tend to have economies between the latter two. Many trade theorists argue that trade barriers between nations should be eliminated or restructured so that each nation can produce what it is best at, so that the entire world will benefit. However, the presumption that some nations are inherently better at some things than others is far from proven. Structural conditions and the improved infrastructures of the industrialized nations could, conceivably give them a competitive advantage on most goods. Yet this effect of increasing returns for the first world may not be comforting to those nations which are less developed.

The United States, Canada, Western Europe, and more recently, Japan, have developed their economies into economic superpowers largely because of two forces (1) access to raw materials (Japan excluded until the modern market) and (2) A relatively educated labor force that was able to direct itself to goods which had higher profit margins. The greatest economic growth sectors have been in the high technology goods, an area where access to knowledge and information has eluded many countries. In other words, these economies have flourished because less-developed countries have been excluded from playing in the high-technology game. Were these countries able to compete, we would expect to see a rapid fall in these profit margins, as competitive forces set in. This would likely cause a recessional effect in the countries of the first world, to the benefit of the second and third worlds, whose economies, overall, would be moderately improved. (Although unskilled labor in these nations would see the same displacement by technology as would the industrialized world).

What should be of concern to us today, in the industrialized world, is an issue that has received little attention: that of technology transfer. Most of our politicians seem to believe

that more exports are good and are pleased to see the highest profit margin goods sold abroad, as this brings more money into the domestic economies. *However, this view of the world is short-sighted and is likely to result in a long-term recessionary effect for industrialized nations that blindly pursue these strategies.*

The market dynamic today encourages high-technology firms to export as many of their goods as they can. This is fueled by financial markets that tend to reward short-term actions that increase share price of a stock over the long-term interests of a company, much less an economy. So, where's the problem?

The problem is that our export policies do not ask what our exports are being used for. Consequently, the industrialized nations are selling off their competitive edge by liberalizing export markets. A less-developed country can buy its raw materials in a liberalized market--no need to have them. Japan is an example of a nation that took this path to growth. Similarly, by purchasing robots and computer technologies from the first world, the non-industrialized nations are now able to compete in the production of the high-value goods, to which they had previously been excluded. We do not actively restrict what we sell. What this means is that tomorrow, Argentina need merely raise $200 million dollars to buy a robotized assemblyline and hire Western minds to run it and innovate new products. Instantly, they will be competing with our economy in what we do best. Our margins will fall. More may be sold between nations in a liberalized market, however margins will go down. The key to economic success is to keep money changing hands within an economy. The global economy may or may not see a net increase in the velocity of money: third world economies will develop, yet profits on goods will decrease. The domestic economy of any industrialized nation is not sure to be improved, particularly with new competition, unless they take immediate action to prevent some of these technology transfers. Yet this is only a medium-term solution. To some extent, our success depends upon the failure of others.

The current global economy may be a sign of what is to come, domestically. We find the skilled nations with relative wealth. The less-skilled nations who are less-able to adapt, are cast aside by the global economy. Efficiency rules. Those who are too slow are trampled, or as in Ethiopia, starve.

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What is to come of our world if we continue to allow efficiency and the drive for growth to rule? The market demands that we constantly retrain ourselves for new skills, yet its technological forces are constantly racing to make us redundant. Once we have mastered a skill, we will run the risk of becoming obsolete. Obsolescence can lead to unemployment and unemployment to fear, anarchy, crime, starvation, and death. The rate of obsolescence seems to be increasing at a rate faster than the decrease in population growth. Hence, the problem that we face is real and imminent.

Efficiency begs our schools to train us better for the market. Yet will skill-based education usurp that of philosophical intellect?

Will our citizens have to live stress-filled lives spending the bulk of their time fighting not to allow themselves to become redundant? What of the millions or billions that do? What kind of a lifestyle is that? Do we control our machines or will our machines control us? Have we created a system that is running out of control? Are we on the edge of catastrophe but too blind to see it?

We need to force our system to adapt, lest it make our lives unlivable. Will the answer be a resort to fascism, war, or can we find a way to slow this growth before it literally runs the risk of killing us or making our lives unbearable? Our natural environment already shows the havoc wreaked by the free-market.

These are not simple issues. This doomsday prophesy will not necessarily result. It may well occur in parts; it may not occur at all. An economy is a very complex and constantly

adapting system. Small structural changes may yield dramatically different results. However, systems often disintegrate when they are unable to adapt to sudden change. In nature, when a species is unable to adapt to sudden shock, it becomes extinct. Its system of life and organization unravels. Is our system headed toward extinction?

Human societies have never seen such a period of remarkable, sudden and unpredictable change as modern technology has created today. Yet many people have faith, based on prior experience, that our system will adapt before crisis results, as it often has done in the past. However, our time is unlike any other time in history. Hence, such confident faith may well be unfounded. Never before has change occurred at such a rapid rate. Telephones, aircraft, automobiles, trucks, and trains have exponentially accelerated the rate of systemic change and decreased the timeframe in which men have to make decisions. In less-efficient eras, man had more time in which to ponder his decisions. His technological limitations minimized the likelihood of global consequences of any such decision. Technological efficiency has eliminated this luxury. Major decisions that used to take weeks to complete are often made in a matter of hours. Global shocks can now be wrought with the flick of a pen or the bump of an oil tanker. We are racing toward the future at such a rate that the potential for miscalculation and potentially disastrous consequences in our planning decisions may well be enormous. We must not forget that our organized society, by restricting degrees of freedom of many of its actors, has given us some predictability in a universe that is still highly complex and chaotic. Control over our destinies is therefore much of an illusion.

So where does this leave us? This question does not have an easy answer. The problem is that we are actors within a system trying to peer into its future paths. Much as our planet's position within the Milky Way Galaxy restricts the ability of astronomers to understand the shape and organization of the Galaxy, such is the situation with man attempting to predict the destiny of a system in which he is an actor.

So we are left with a suboptimal solution: we must infer from the trends that we can observe and try to plan our actions accordingly. This is how we guide our lives and our relationships with others. This is what we must do in planning our future world order. This is the skill, as faulted as it may be, that has placed and keeps man in his position at the top of the animal kingdom.

This article has attempted to identify such trends that currently appear to exist. It has attempted to show that there is ample evidence suggesting cause for alarm and that should these trends persist and continue in their present directions, they may well affect the described scenarios. Yet if we, as internal actors in the system, are conscious of these risks and bring them to the forefront of discussions and decisions regarding our collective future, might we not increase the probability of averting such catastrophic eventualities? Might our system's actors be able to affect their own destinies? Might we not find some way of having an efficiency of inefficiency, a world order in which we reach an equilibrium where the majority of the world's citizens (or our country's own citizens) can concentrate more heavily on the activities of pleasure, not the activities of competition?

The physicist, Enrico Fermi posed the question, "Where are they?," slightly before his death. He was referring to alien life that mathematically should exist on several of millions of similar planets several times the age of Earth, that one would expect to have reached a higher state of evolution and technological sophistication. Why haven't we heard from them? Perhaps they destroyed themselves. Let us not do the same. Let us address these issues now, as best we are able.

AFTERWORD:

Our capital markets, by their intrinsic legal design, have created an incentive structure that is directed toward the owners of corporate capital <u>and in whose interests, managers and employees are supposed to serve</u>. It is primarily these capital owners, these shareholders, who receive the spoils of

increased efficiency. It is through the serving of this structure of our own creation that we propel ourselves into this strange drive for efficiency. Why would capital owners want to advance a structure that may lead to long-term unliveability and malaise? The answer is another example of "the tragedy of the commons." They do not consciously desire this end. However, it is analogous to voting behavior. If one person does not vote in an election, he is unlikely to feel that it will make much of a difference. If several individuals act in this way, it may well throw the election. Shareholders, in our modern capital markets, are in for short to medium term gains. *The aforementioned efficiency practices yield such gains, satisfying both manager and capital owner with short to medium-run profits.* Companies engage in efficiency practices for the benefit of their shareholders. Managers are hired and fired depending upon how well they perform this task. Technology, an inevitability, is merely a tool in this process. In an enormous global market, each individual capital owner (shareholder) is unlikely to feel that his actions are having a global effect. He likely views himself as just a stockholder, not as one of the causal forces behind the changes which are affecting his life and his environment and potentially decreasing his long-run opportunities.

Yet, collectively, such a global result does occur and the strange peculiarities of the drive for efficiency and its market signals are pushed forward. Short-term gains propel long-term losses. Is the answer to our problem in correcting these market signals? Can we create a structuring of our economies that reduces the incessant market signals toward growth and more growth? Will progress become regress?

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