Beyond Capitalism

Beyond Capitalism:

New Social Architectures

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PREFACE

We are all in search of new paths. Wolfgang Streeck notes that it may not be the end of capitalism, but it certainly is the end of democratic capitalism. Joseph Stiglitz, on a more optimistic note, suggests we should head towards progressive capitalism; Thomas Piketty, participative socialism. Bernie Sanders recovered the legitimacy and potential of the concept of socialism. But this is not a labeling problem. Solutions are not in the past, despite the strong echo produced by Trump's *Make America Great Again* or Brexit's promise of bringing back sovereignty. Rather, we must understand and qualify the mechanisms behind this sudden hastening of history, the structural transformation of the world we know.

At the time we write, the world witnesses, in awe and fear, as a minute virus spreads its devastating impact, revealing to us all our frailty. After having convinced ourselves that we have been made in the likeness of gods, we realize we are made of the same cells as the rest of nature, smarter for sure, but equally vulnerable. We already consider colonizing Mars, but still need to learn to survive on Earth.

The pandemic striking us did not come alone. Rather, it joins, at a crucial time, a global-scale convergence of critical tendencies. We are a population closing in on 8 billion, rising at 80 million per year, and all wanting to consume more. We are wreaking havoc on the planet's natural environments faster than ever. The disastrous list includes climate change, loss of biodiversity, soil degradation, freshwater pollution, marine pollution from plastic and other residues, resistant bacteria created from antibiotic use on livestock. One needs only a glance at the children living in the dumping grounds surrounding the cities of the world, fighting rats and vultures for garbage, to realize the tragedy.

At another level, and converging with the environmental catastrophe, we have the tragedy of inequality. Cold-blooded statistics show us that 1% of humans hold more accumulated wealth than the other 99%. But these are people, individuals that, rich or poor, white or black, were born with the same potential to contribute to society, a world of possibilities to hope for. A poverty-producing machine criminally sterilizes this potential and reduces these possibilities. Any farmer cultivating the land in Nigeria has

more social intelligence and contributes more to humanity than the idiots of Wall Street, who happily shout out that *Greed is Good*.

We have 820 million people starving in the world, out of which 150 million are children, and this, with a daily world production of over 1.5 kilos of food per person. If we divide the world GDP, of about 85 trillion dollars, by the world population, we find that what we now produce could provide three thousand dollars per month per family of four. Our problem is not economic. It lies, rather, in the political and ideological machine that promotes and justifies the absurd partition of the results of human effort, with no connection be it to the most rudimentary merit criterion, or human decency for that matter.

Thus, together with environmental destruction, inequality is a second critical axis. The billions excluded from humanity's achievements, in terms of social progress and technological advances, do not accept this injustice anymore. They feel threatened, unsafe and, in any case, know they are being excluded. They vote, sure enough, on any demagogue preaching hatred against real or imaginary culprits. Hatred has a powerful cathartic effect on frustration. The idea of building a wall between rich and poor, United States and Mexico, – an idea that already failed in the past – shows in a certain way the stark contrast between our technological intelligence and our difficulty to organize a civilized life together. The gap between the political and social sphere is growing. No politics works above a certain level of inequality.

A third critical axis, which will be thoroughly discussed in the present work, is financial chaos. Formerly (that is, a few decades ago), governments issued currency. This was money in the form of paper and coin, which we carried in our pockets, and banks stored in their vaults. Now, 97% of what we modernly call "liquidity" is solely magnetic signals emitted by banks. With governments controlling national spaces and "liquidity" flowing throughout the planet at virtually the speed of light – High-Frequency Trading, as it is now called – there is a radical discrepancy between the financial world and the old regulatory bodies. Global financial chaos has settled in. Its fundamental impact is making financial investments, basically speculation, more profitable and attractive than productive investments.

Money is no longer going where it is needed, particularly to funding the reversion of environmental destruction and the reduction of inequality. Even productive companies are exploited. This has opened the way for fortunes the size of which the world has never seen, in the hands of people who

produce nothing. On the contrary, they divert money from the primary function of fostering productive investments and development. Instead, this money is directed to fueling rentism. Joseph Stiglitz, Michael Hudson, Thomas Piketty, Ann Pettifor, and many others have analyzed in detail the notion of rentism. Marjorie Kelly calls this "extractive capitalism".

The environmental destruction, rising inequality levels, financial chaos, and the present pandemic converge to outline a global systemic crisis. As rarely seen before, numerous researchers and analysts are signaling a structural transformation in terms of how we organize ourselves on this small celestial object called Earth. I have no doubt we are dealing with a crisis of civilization.

The converging crises open up an immense space for new ideas. The extensive alterations in political culture create opportunities for change. But to establish and play by the new rules, we must delve into the current mechanisms and understand how the forces are structured, as well as the viable alternatives. The future is not written. The four crises interact chaotically. However, the last link, the minute virus that paralyzed the planet, has, precisely by forcing a halt in activities, opened space for change. We may, of course, overcome the virus and go back to slowly destroying the planet. But the chaos generated holds an immense opportunity for change. We can in fact think beyond capitalism.

INTRODUCTION

The technology has such potential that its impact on society is widely expected to be as profound as the industrial revolution.
—New Scientist, April 23, 2018

Prosperity for all cannot be delivered by austerity-minded politicians, rent-seeking corporations and speculative bankers. What is urgently needed now is a global new deal.
—Unctad. 2017, ii

World history is nothing but an endless, dreary account of the rape of the weak by the strong…The externals of civilization – technology, industry, commerce and so on – also require a common basis of intellectual honesty and morality.
—Hermann Hesse, The Glass Bead Game, 1943

A working hypothesis may prove very useful. We propose here to consider a set of transformations currently underway through the concept of change in the mode of production. Capitalism is changing. According to the analytical framework, we find developments on different notions, such as the informational factor in productivity and the network society (Manuel Castells), the advent of the "immaterial" (André Gorz), the zero marginal cost society (Jeremy Rifkin), the sharing economy (Arun Sundararajan), financial capitalism (François Chesnais, David Harvey), global capitalism (Joseph Stiglitz), the complexity era (Edgard Morin), parasitic capitalism (Zygmunt Bauman), and the world-systems (Immanuel Wallerstein). Alvin Toffler, in *The Third Wave*, already signaled the search for an integrated approach. We all strive to make sense of modernity as it advances. There is no global previous "scheme", but there will be, beyond any doubt, a systemic resultant arising from the convergence of present chaotic processes of transformation. A whole different animal is being born.

Capitalism is changing rapidly and deeply. Certain labels are used to characterize its changes or order its stages. We have imperialist, liberal, rentier, and also neoliberal or global, dependent or dominant, central or peripheral capitalism. We may yet refer to a set of rules, like those of the Washington Consensus, to present a more integrated view of what we mean to express, or refer to the 3rd and 4th industrial revolutions, or even to the Anthropocene. In general terms, we refer to "all of that" as neoliberalism.

The animal is still the same, but with different colors, a larger mane, a more or less aggressive behavior, with more or less cohesive parts. In epistemological terms, we end up saving ourselves by adding “neo” or “post” to different scientific schools of thought.

As changes become more pronounced, however, and the more traditional concepts no longer adequately describe the real world, we are naturally led to wonder whether we are still studying variations of the same animal, or characteristics of a new, yet to be born one. The butterfly is a transformation of the chrysalis, but it is radically different. This approach presents no impediments; scientific orthodoxy has already assimilated the view that the sum of quantitative changes leads to a qualitative mutation. In the present study, we will discuss a set of changes in capitalism that may characterize the evolution towards another mode of production, which can be described as informational, constituting another era different from the industrial one: the era of knowledge.

Although adding labels to the traditional image of capitalism may help, it may prove more instructive to adopt a hypothesis of transition into a new mode of production, in which the different vectors of change in society together form another systemic logic. This new logic characterizes another mode of production. This approach seems to me more useful than the idea of another matrix or paradigm. My question is whether it would be more productive, in scientific terms, to use the framework of industrial capitalism and note how the past is deforming or to look towards the future and consider what new system is emerging.

From the industrial revolution, we inherited machine-based production relations, the private property of the means of production, the relation between the bourgeoisie and proletariat, and profit and salary. What are the trends and new relations brought about by this new era, marked by a revolution in knowledge, rapid advances in communication and information technologies, and the rise of immaterial money? What are the new inner workings? Which are the novel exclusions? We will not attempt to answer such broad questions, but rather understand how changes may gain clarity and understandability when submitted to analysis as parts of a new dynamics and not alterations of an old one. The idea of a 4.0 Industrial Revolution frankly does not help. I am convinced that it is much more than that. The technological revolution we are currently witnessing is much more than a stage of the Industrial Revolution.

We will approach the matter as a broader social transformation, broad enough to generate a knowledge society, just as we have had agrarian and industrial societies. In this perspective, there are massive implications. The many agrarian societies of the past had political structures and production relations established around a key factor: the land. The industrial society had political structures and production relations based on the private property of the new means of production: machines. What political structure and production relations will organize the societies in which the key factor is knowledge?

In the land era, the feud, or fence, was the boundary. The property was based on family relations and connected to nobility. Production relations were based on slavery or serfdom. Minds were controlled through religion and by the corresponding ecclesiastical power. In the industrial era, walls and gateways were placed around factories, the property was based on control over the means of production, and production relations were based on workers' wages and the surplus-value. Minds were controlled through consumerism and advertising. Is there a similar systemic order for the era of knowledge and technological revolution?

Marx's views, his approach to macro-social analysis, remain stubbornly relevant. It is essential, however, to reconstruct the concepts, rather than simply transpose them. While analyzing the industrial revolution, Marx did the work of showing the new technical relations of production (the division of labor, socialization of production, the birth of the factory environment); the resulting social relations (based on wages and the surplus-value in particular); and the new power relations (based on the private property of the means of production). This infrastructure corresponded to certain superstructures, characteristic of capitalism: the bourgeois democracy and the legal system, as well as the elements that form a corresponding value system: the liberal ideology, the *homo economicus*, and the money and consumption culture. Furthermore, the system's legitimacy was associated with the fair remuneration of capital (profit) and work (salary). Each system's narrative is also fundamental.

With this pair – infrastructure and superstructure – Marx characterized the capitalist mode of production. With the new technical and social relations, and new forms of power and surplus appropriation, can we still use the same frame of reference? Labor exploitation not only continues but worsens, as the data on inequality indicate. Exploitation is, however, common to all systems and may repeat itself within renewed dynamics and mechanisms. The question may be premature, given the novelty of the trends, but it is

legitimate. The answer will probably depend on the ability of the new global elites – new, since they essentially manipulate symbols and images and are now scarcely found in factory management – to absorb the emerging dynamics to their advantage.

The new society undeniably brings with it both a potential for liberation and the grim prospect of an oppressive future, to the likes of Orwell's *1984* or Huxley's *Brave New World*. Yet, if the outcome is grim, the new forms of domination will not necessarily characterize a capitalist mode of production. When social surplus appropriation ceases to happen primarily through salary exploitation, the changes are qualitative. The systemic logic behind the processes of social reproduction is thus rearranged and shifted. Bill Gates or Carlos Slim's billionaire appropriations are set upon immaterial systems and not factories. David Harvey, in *The Madness of Economic Reason*, rightly notes that Thomas Piketty's "capital", in *Capital of the 21st Century*, is not precisely capital, but wealth. It is in any case worthwhile listing, orderly, the great axes of change, the mega-trends that are generating a new world. New does not mean better: environmental, social, and economic issues are critically worsening. But, without a doubt, things are functioning differently.

I –

THE TRANSFORMATION IN THE PRODUCTIVE BASIS OF SOCIETY

Capitalism emerges as a revolution in the productive forces: by connecting machines to new energy sources, we began operating machines with an external energy supply. Now, we program machines. We generate primarily knowledge, technology, design, all of which are immaterial. This is not restricted to the field of robotics, which increasingly penetrates different industries. The local farmer now uses artificial insemination and soil analysis, and physicians have the support of laboratory networks and perform remote surgeries. The central axis of change is that technology is now the main factor of production. This modifies capitalism, since technological knowledge, different from machines and physical labor, is immaterial. Machines are still important, for sure, but incorporated knowledge is the structuring axis. Knowledge is an immaterial asset.

Technology as the main factor of production

Jeremy Rifkin's studies about the zero marginal-cost society help to size the ongoing transformation. Physical goods – watches, for example – are rivalrous, because if someone takes them, another person ceases to have them. This is why private property is central in the capitalist society. But if I share knowledge, I will not be deprived of it; knowledge is a non-rivalrous good. This means that in the modern economy, the supply of the main factor of production is not affected by use. On the contrary, it can be multiplied indefinitely. This opens new epistemological grounds for economics, a science that is based on optimizing the allocation of scarce resources. The main factor of production is not scarce. This also explains why so many corporations strive to produce artificial scarcity to charge access. The nature of a factor that can be multiplied indefinitely without additional cost is, precisely, open access. Restricting access to good ideas makes no sense; it is dramatic underuse of a potential tool for society's development. We have moved historically from the land to machines and from machines to

knowledge. The productive basis of society is shifting radically and quickly, with profound impacts on the entire system's logic.

The revolution in the system of knowledge expansion

There is no denying that the information era has transformed our mode of production. We have innovative scientific applications in almost every sector: energy, transportation, medicine, education, culture, new materials, and so on. However, the depth and rhythm of innovation highly depend on the capacity of expanding and managing knowledge. Alan Turing's conceptual developments and subsequent decoding machine changed the face of World War II and brought us a knowledge machine, marking the start of the digital age. The ability to express virtually all units of information, whether letters, numbers, colors or sounds, with only two signals, "0" and "1", made it possible to embed human knowledge in magnetic signals. This is a radical innovation in the innovative capacity itself: the machine's machine, the brain's extension. Knowledge, since then, progressively dismisses the physical mediums – books, paintings, discs – to which it was previously tied. The main factor of production, an intangible one, encounters its immaterial medium, the magnetic signal.

It is hard to picture research on DNA, for instance, without computers. It is especially hard to imagine innovation in computing power without computing itself. In 1776, while considering the mechanization of pin production, Adam Smith foresaw a massive transformation, which led him to outline the characteristics of the industrial revolution. His work is to date relevant. Rather than the quantitative aspect of manufacturing (insignificant at the time), he focuses on its potential to transform society as a whole. Just as the evolution of looms led to improved weaving techniques, the economy of knowledge now improves the tool for managing knowledge: computing. In this way, transformations undergo a cumulative and interactive process. Our evolution into a society of knowledge and the fact that we have the corresponding tools indicate a transformation as profound as that of the industrial revolution. The machine of today is, in a way, the knowledge machine. Knowledge, as the new basis of the economy, has produced its own corresponding "machine". It is radically different for being, essentially, immaterial. We are facing the digital revolution.

Knowledge and connectivity: the internet era

In terms of a historical process of transformation, we are still at the beginning. Two billion people still cook with firewood, and more than one billion still have no access to electricity. But widespread digital inclusion is only a matter of years now, as it is not just in the interest of the excluded, but also of various agents in the process. The era of knowledge is rapidly spreading computers across the households of the world where there is reasonable income. It is on its way to reaching every company and government department, every airplane, car, and pocket. It is not just one more technology. It is what enables receiving, storing, handling, and interconnecting nearly unlimited amounts of knowledge. This technology is triggering a cumulative process of expansion.

The industrial capitalist economy set up production and distribution infrastructures, covering the planet with power grids, railroads, highways, and telecommunication networks, as well as other systems that organize productive processes. The era of knowledge has surpassed telegraphy and good old telephony to generate global connectivity. Since we are experiencing transformations from the inside, so to speak, we may sometimes fail to realize the earthshaking impact of the fact that we can now instantly connect to any person or company, and even a document, movie or information unit, in any part of the world, at practically no cost. This is the agea of total and global connectivity, an immaterial universe that works at practically the speed of light. Contrary to the audacious assumption of the *end of history*, we are witnessing faster and deeper transformations than ever before. We have a dominant factor of production that is immaterial (knowledge), the means for storing and handling it (computing), and the global connectivity necessary to make this factor of production instantly available at any given place, to any given person. This, in terms of economic, social, and political organization, is much more than a stage in industrial capitalism.

Redefining space and territory

In the era of "Space is Dead" and "The World is Flat", of everything-here-and-now, the very concepts of territory, belonging, and identity are changing. People create social bonds according to a variety of interests; productive processes are internationally coordinated; financial flows cross the planet instantly; new forms of economic, social and cultural organizations are starting to form and with them, of course, new forms of

political organization, in which the roles of national spaces are being redefined, and significantly weakened.

The idea of imperialism as a superior stage of capitalism is familiar. We are moving beyond this view. The so-called Third World, distant and unknown until a few centuries ago, was first enslaved, then colonized (when the peoples had the privilege of being enslaved in their own land) and, more recently, in the context of industrial imperialism, exploited by the industrialized countries. The Third World countries now strive to find space within the narrow range of possibilities opened to them by the dominant economies. They have achieved independence and supposedly sovereignty. But they are tied to a planetary machine of economic and financial power that increasingly articulates political and cultural power as well. How will the space of the 20th-century Nation-states be redefined in the globalized world of the 21st century?

Corporations, which are central political and economic agents of the new globalization, are organized in networks across the planet. Each one of them covers dozens or even up to a hundred countries, influencing or controlling politics, justice, the media, and culture. This is not new. The same tendency is described in Marx and Engels' 1848 Manifesto. Once more, however, accumulated quantitative changes have led to a qualitative systemic change. The nationalist clamors, present in Trump's *Make America Great Again* or the UK's Brexit, seem like the dying cry of the past century's glories. For better or worse, a new world is forming. When will we acknowledge that virtually all large corporations use tax havens, a type of financial extraterritoriality ("off-shore" is a meaningful notion), to manage their financial assets beyond the reach, as well as the knowledge, of governments?

We must, as a set of national economies with foreign trade, move beyond capitalism to analyze its process of worldwide osmosis. There is a systemic discrepancy between the global dimension of the economy and the fragmented regulatory power of the nations. The scores of companies that constituted the entrepreneurial world of the past needed a regulatory State to guarantee order and respect to contracts. With the reorganized world of corporations, politics is being rescaled and played by corporations themselves. A whole new animal is being born. In terms of the mode of production, the changes in infrastructure are generating new superstructures, as we will later see.

The intangible economy

We are rapidly becoming a global society, demographically established in cities, and with a knowledge-based economy – what André Gorz calls the *immaterial* and others call the *intangible*. In *Capitalism without Capital*, Haskel and Estaque note that, at the turn of the millennium, there was an inversion in the proportion of investments in physical equipment in comparison to the investments in technology, design, image, and the like – the intangibles. The main investment flows do not result in machines or chimneys anymore, but in a broader capacity to control organized knowledge. In the last century, the capitalist was, and will surely continue to be during a large part of this century, the factory and harvest owner. However, the present-day capitalist is increasingly becoming the controller of immaterial assets, such as virtual platforms, apps, patents, and copyrights. They also control financial flows: magnetic signals that define other equally immaterial – and drastically more powerful – forms of appropriation and control.

It is worthwhile to examine the great fortunes of the new economic world: among them, there are no factories or machines, but instead technology, software, virtual intermediation platforms, organization systems, algorithms, and artificial intelligence. We notice that a fundamental theoretical shift is necessary to understand these new processes: we are not dealing with the ownership of the means of production but of the control systems. Will the concept of the socialization of the means of production remain the same? It is also equally important to remember that the first in-depth analysis of the world corporate system, conducted in 2011 by the Swiss Federal Institute of Technology (ETH Zurich), is called *The Network of Global Corporate Control*. The idea of such a network goes much further than the concept of property. The authors even estimated that the concentration of power through control was ten times larger than what the companies' valuation showed at first glance. The concept of the private property of the means of production has changed. Bloomberg's list of the largest fortunes is highly informative:

Bloomberg ▼ | Bloomberg Billionaires Index

Rank	Name	Total net worth ▼	$ Last change	$ YTD change	Country	Industry
1	Jeff Bezos	**$100B**	+$328M	+$35.0B	United States	Technology
2	Bill Gates	**$91.7B**	+$154M	+$9.33B	United States	Technology
3	Warren Buffett	**$85.8B**	+$311M	+$12.6B	United States	Diversified
4	Amancio Ortega	**$75.2B**	-$491M	+$3.10B	Spain	Retail
5	Mark Zuckerberg	**$73.4B**	+$119M	+$23.4B	United States	Technology
6	Bernard Arnault	**$63.3B**	-$334M	+$24.1B	France	Consumer
7	Carlos Slim	**$62.7B**	+$402M	+$12.9B	Mexico	Diversified
8	Larry Ellison	**$53.3B**	+$152M	+$11.7B	United States	Technology
9	Larry Page	**$52.5B**	-$84.6M	+$12.6B	United States	Technology
10	Ingvar Kamprad	**$52.4B**	-$3.92M	+$8.41B	Sweden	Retail

Source: https://www.bloomberg.com/billionaires/

If a traditional 20th-century company went bankrupt, creditors could sell the machines and equipment and recover a large part of the money. In the case of the fortunes above, if the corresponding companies went bankrupt, they would yield only wishful thinking and a bad reputation. The concept of the value of the means of production has changed, and so has the way social surplus is extracted and transformed into wealth.

Haskel and Westlake dedicate a good part of their book, *Capitalism without Capital*, to capturing the profound differences that characterize the intangible capital. It is different from

> a physical asset like a factory or a shop or a telephone line: once these assets reach their capacity, you need to invest in new ones. But intangibles do not have to obey the same set of physical laws: they can generally be used again and again. Let's call this characteristic of intangibles scalability... It should come as no surprise that things that one can't touch, like ideas, commercial relationships, and know-how, are fundamentally different from physical things like machines and buildings. (60-61)

This is an earthshaking transformation. Intangible assets, being indefinitely reproducible, open the way for a global, widespread increase in productivity without additional costs. These are not studies on the possible outcomes: while comparing the dynamics of the added value in the manufacturing and services sectors in the United States and France, the authors noticed an inversion in the relative importance of tangible and intangible assets.

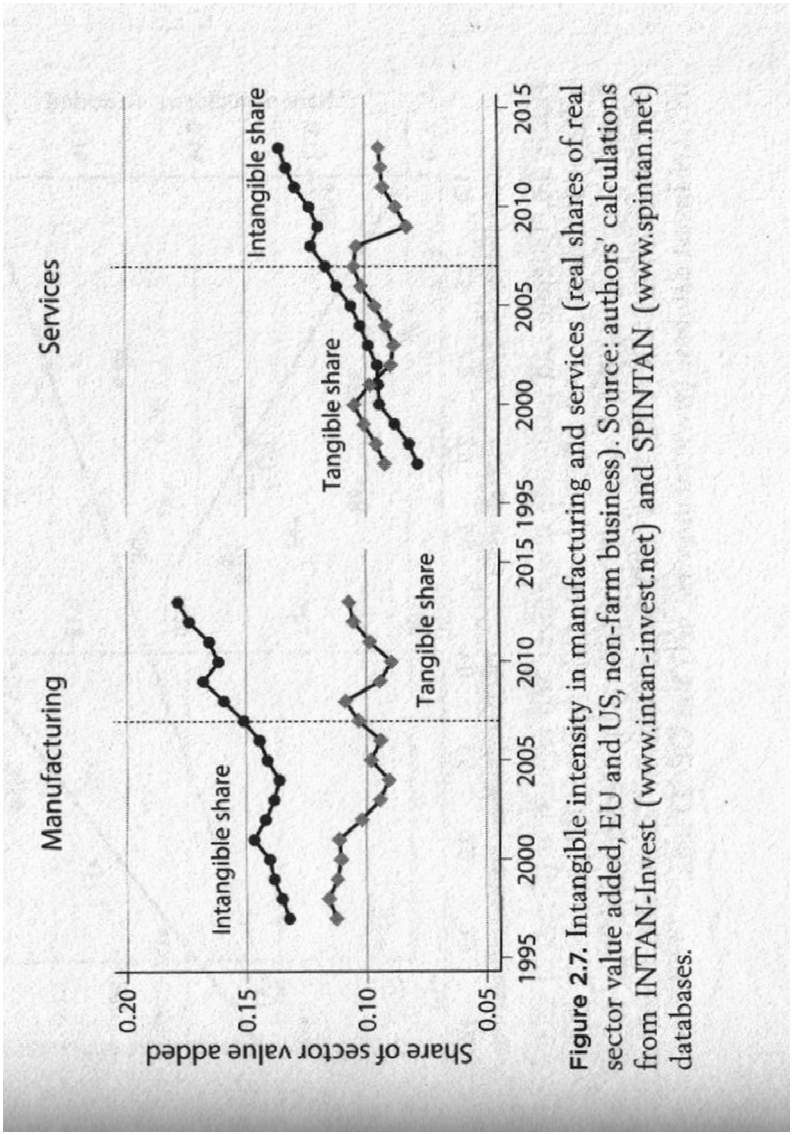

Figure 2.7. Intangible intensity in manufacturing and services (real shares of real sector value added, EU and US, non-farm business). Source: authors' calculations from INTAN-Invest (www.intan-invest.net) and SPINTAN (www.spintan.net) databases.

Source: Haskel and Westlake, *Capitalism without Capital,* 31

Naturally, intangible goods do not simply substitute tangible ones. We still need food, housing, transportation, and such, but in essence, the actual physical costs, like those of raw materials and traditional labor – the stevedore's back, so to speak – become, in due proportion, increasingly secondary in the productive processes. Furthermore, those who control the intangible assets also progressively control the traditional productive systems. In the knowledge era, in which new technological processes and new forms of taking over the surplus and the political systems are gaining prominence, agriculture and manufacturing will not be substituted but subjected to a new logic that must be clarified.

The guideline of Haskel and Westlake's research:

> Our central argument in this book is that there is something fundamentally different about intangible investment, and that understanding the steady move to intangible investment helps us understand some of the key issues facing us today: innovation and growth, inequality, the role of management, and financial and policy reform. We shall argue there are two big differences with intangible assets. First, most measurement conventions ignore them. There are some good reasons for this, but as intangibles have become more important, it means we are now trying to measure capitalism without counting all the capital. Second, the basic economic properties of intangibles make an intangible-rich economy behave differently from a tangible-rich one. (7)

In the present study, this is precisely what we focus on: to what extent do the changes in "basic economic properties" change not only the economy but the mode of production, in the broader sense?

An indefinitely multipliable wealth

Let us return to Jeremy Rifkin. The concept that names his book, the *zero marginal-cost society*, may seem foreign to non-economists, but the principle is very simple: as we penetrate the society of knowledge and the creative economy, the axis for economic analysis changes. We enter the immaterial economy, as André Gorz calls it. In it, the main factor of production, knowledge, may be spread across the world once it is produced, with free, unlimited access, and zero additional cost. If I pass on a physical good to someone, I cease to have it. It is said to be a "rival good", and having its ownership is essential. But if I pass on an idea, I will still have it; it is a "non-rival good". The rational allocation of scarce supplies is the traditional object of economics. In this new context, the entire framework for economic analysis based on scarcity has shifted. Instead of increasing production to

increase profit, capitalism starts searching for ways to create artificial scarcity and to combat decentralized, collaborative processes of wealth multiplication.

The system thus produces a value inversion. Denying free access to the books and movies you could find online becomes central to the dominant system. To the consumer, however, easy access is what matters. After the initial costs of production are covered, and a reasonable profit is made, is there any excuse for charging each additional access that generates no cost? After all, do the rules that apply to an economy of goods, in which new investments are required for every new unit produced, apply to goods and services that may be infinitely reproduced at zero cost?

How do we organize an economy, Rifkin asks,

> where the marginal costs of generating, storing, and sharing communications, energy, and a growing number of products and services are heading to nearly zero? A new communication/energy matrix is emerging, and with it a new "smart" public infrastructure. The Internet of Things (IoT) will connect everyone and everything in a new economic paradigm that is far more complex than the First and Second Industrial Revolutions, but one whose architecture is distributed rather than centralized. Even more important, the new economy will optimize the general welfare by way of laterally integrated networks on the Collaborative Commons, rather than vertically integrated businesses in the capitalist market. (56)

Rifkin coherently provides open access to his book, which is in itself an example of the transformation. Through the book, he is disseminating knowledge about economic mechanisms, contributing to society's educational level and, on a small scale, also to productivity and general well-being. Prosperity is a social construction. Is the author forgoing profit? It turns out he is actually amplifying his reach. The invitations he will consequently receive to expose his ideas will earn him more money and, probably, he will sell yet more books in the traditional format. In this knowledge-dense, immaterial economic cycle, we must balance paid and collaborative tasks, aware that as knowledge becomes the main factor of production, the indirect profit dimension broadens. These are the new forms of balance being established.

This is not restricted to sharing music with friends or uploading videos on YouTube. Rifkin provides several examples in finance, where numerous peer-to-peer (P2P) networks enable financial flows between those who have stagnant resources and those who need them, dodging the abusive interest

rates and tariffs charged by financial intermediaries. With the rapidly decreasing costs of photovoltaic cells, independent energy production rapidly grows in households, as well as networks for transferring the surplus energy. In the logistics sector, trucks traditionally perform a significant amount of empty travels. The creation of an information network on current truck loads and destinations allows companies to transport each other's loads, optimizing routing plans and reducing fuel costs. Individual truck owners will also belong to an information network in which knowledge of the flows can improve logistics as a whole, letting them make decisions without having to wait for orders. These are the so-called organizational benefits; they are highly productive, even if immaterial. Loss reduction and process improvement may even result in a GDP reduction. They do, however, certainly improve our economies' performances. My online communication improves my productivity, but the fact that I do not use the traditional mail services reduces employment and transportation costs that would be accounted for as economic activity, GDP growth.

Advertisement is also changing. Instead of buying because the ad says the product is wonderful, customers now read the barcode with their phones and a list of previous buyers' opinions appear on the screen – filtered to cut out the false personal opinions that companies try to include. As the audiences migrated from the television to the internet, especially the younger generations, so did advertisements. This was not easy, however. People were used to commercial breaks on television, but advertisement interruption on the internet makes people annoyed and produces negative brand perception. Times are changing. The common ground is that the new global connectivity and the dominant immaterial dimension of the main factor of production are demanding new rules to the game.

To Rifkin, the rapid expansion of this new economy opens the possibility to escape the giants of intermediation and shows a way out of an economic dog-eat-dog mentality. The way is progressively opening for direct collaboration between economic agents, who are now at the same time producers and consumers, the well-known "prosumers". Is this excessive optimism? Perhaps. But instead of knowledge on how favorable the future will be, we take from the book a good understanding of the rising opportunities for a more humane economy.

Haskel and Westlake summarize the essential aspect of the intangible economy, of being indefinitely expandable with little or no additional costs, through the concept of scalability:

> From an economic point of view, scalability derives from a key feature of ideas: what economists call 'non-rivalry.' If I drink a glass of water, you cannot drink the same glass: it is a 'rival' good. But if I use an idea, you too can use the same idea: the idea is non-rival. (...) This scalability applies to many sorts of intangible assets. Once a business has created or acquired an intangible asset, it can usually make use of it again and again at relatively little cost, compared to most physical assets. (66/65)

When saline solution was found to provide oral rehydration, its use spread across the world, saving millions of children, and no one thought of issuing a patent and restricting access to its benefits. The widespread use of this technology did not harm its creator. But could money be made from a patent in this case? We are at the heart of a set of new dilemmas related to economic organization. Is a person or company's possible profit more important than the potential social benefit? The contradiction between the social process of production and the private appropriation of the results becomes particularly evident. Gar Alperovitz and Lew Daly studied this subject in their book *Unjust Deserts*, as we will later see.

Haskel and Westlake, with no Marxism, summarize the tendency clearly: "The social rate of return exceeds the private rate" (112). The obstacles presented by bureaucracy, patents, and copyrights lead to less profit at the individual level in comparison to the potential social benefits of open access. In terms of systemic productivity, private appropriation may become increasingly unproductive. The balance between individual benefits and social interests is changing. Let us not forget that today, a new segment of intermediaries has specialized in buying patents to later charge fees from companies who wish to produce further research or develop products. Between the innovator's stimulus to earn profit and society's diffuse interests, we must consider the general concept of remuneration for intangible goods. The authors quote Thomas Jefferson: "He who receives an idea from me receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me" (72).

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The huge transformation of the dominant productive processes is undeniable. We are witnessing a technology boom. We are gaining progressive control over the very process of knowledge expansion. And the supply of this factor of production is not affected by use. Furthermore, with global connectivity, intelligent connections between information, documents, people, and institutions can be made with virtually no additional costs. The traditional spaces that circumscribed the realm of specific economic activities are being

dismantled. The traditional farming or manufacturing units are now controlled by financial or informational systems with platforms, networks, and algorithms. The newly established technical relations of production transform the productive processes, which in turn deeply transform the social relations of production. During feudalism, the main factor of production was the land; during industrial capitalism, it was the machine. Now it is knowledge, which, as a factor of production, requires different institutions. From the feudal lord and serf to the industrial capitalist and factory worker, the social relations of production change. What will come along with the new horizons?

II –

THE CHANGES IN THE SOCIAL RELATIONS OF PRODUCTION

We saw above the massive changes in the content of productive processes. Naturally, we will continue producing wheat and rice, steel and automobiles. But the basic element of value formation, the main factor of production, is a set of intangible activities that may be generalized without significant additional costs. When manufacturing first appeared, agriculture did not vanish. On the contrary, it had to be intensified to provide food for the cities and raw materials for the factories. But the dominant axis of the social structure became manufacturing, which in turn transformed agriculture itself. With the emergence of knowledge and intangibles in general, manufacturing and agriculture gained productive capacity. This is due precisely to the advances in the intangible activities that now dominate transformations. But those who have control are not necessarily the same as those who control machines anymore.

Just as the logic of industrial accumulation dominated social relations of production during the late 19th century and the 20th century, today, the dynamics that structure society are access to information and control over knowledge, in a broad sense. André Gorz summarizes, in the very first pages of his study *The Immaterial*, the extent of the transformations:

> The wide acceptance of knowledge as the main productive force caused a change that compromises the validity of the key economic categories and indicates the need to establish another economy. The knowledge economy that is currently spreading is a form of capitalism that aims to redefine its main categories – labor, value, and capital – and in this way embraces new domains. (9)

Controlling knowledge is controlling society's main factor of production. Ignacy Sachs synthesized this idea very well: over the last century, power was in the hands of factory controllers. In this century, power will be in the hands of those who control information. Just as the logic of social organization changed with the transition from the agrarian to the industrial

era, so will we face a profound systemic change with the information era. This framework seems to us more informative of the fast-paced changes we are living through than the idea of a fourth industrial revolution. The technical bases of the productive processes have changed. We will see the impacts of this on the social relations of production as a whole.

From market competition to intercompany organization

In the manufacturing world, the tendency to grow to monumental proportions has always been strong. The possibility of spreading the fixed costs of machines and equipment over more products generally guaranteed the so-called economies of scale. General Motors is an emblematic case, among many others. This is the logic of large production companies with specific products: when we speak of GM cars, we know who and what we are talking about. The business giants below own assets larger than the GDP of most countries. They have also created networks in which they have shareholding control over various activities. Warren Buffett's Berkshire Hathaway, ranking seventh in the list below, was initially in the textile sector but is now essentially a financial holding company. It controls and extracts dividends from different businesses, in rail transportation, encyclopedias, media, vacuum cleaners, jewelry, electricity, natural gas, and in particular insurance. It shares interests with Goldman Sachs and Bill Gates is its second-largest shareholder. It all stays in the family. Alphabet controls Google, and Tencent is a Chinese tech and video game giant.

Market value, in million dollars – 2018

(Current Market Cap)	Short Name	Market Cap
1	APPLE INC	860.88B
2	ALPHABET INC-A	729.29B
3	MICROSOFT CORP	659.91B
4	AMAZON.COM INC	563.54B
5	FACEBOOK INC-A	514.99B
6	TENCENT	493.56B
7	BERKSHIRE HATH-A	489.25B
8	ALIBABA GRP-ADR	441.62B
9	JOHNSON&JOHNSON	375.36B
10	JPMORGAN CHASE	371.05B

Source: https://www.theguardian.com/business/2018/jan/03/apple-leads-race-to-become-world-first-1tn-dollar-company

The economic weight of these groups is highlighted by The Guardian:

> The world's top five companies are collectively worth $3.35tn – more than the gross domestic product of the UK and every other country on Earth bar the US, China, Japan and Germany. The huge increase in valuations came after global stock markets ended 2017 at record highs, as share prices benefitted from President Donald Trump's tax cuts and continued quantitative easing from central banks.

They are giants, but giants whose massive bodies are essentially the control networks that allow them to extract dividends. If their machines and facilities were to be sold, they would not yield much. Their value is fundamentally immaterial and lies in their systemic ability to extract dividends. The occasional factory is merely an outsourced provider under their control. Interests are arranged in an entirely different way in comparison to the traditional entrepreneurial system. These corporations' valuations are based on their stock price, which in turn depends on the dividends paid to shareholders. At the top of the pyramid, we find the assets of the new economy, which are essentially immaterial. What material support would be sold with Facebook?

The transformation was followed by a curious shift in the concept of the market. As defined in classical economic theory, the concept referred to the free exchange of goods and services, leading to a natural balance between prices and quantities. Since there are numerous companies, none can dominate and distort the process. This type of market still exists, for