



WIDER ATLANTIC POLICY PAPER SERIES

MASTERS OF THE ALGORITHMS

The Geopolitics of the New Digital Economy from Ford to Google

ALFREDO G. A. VALLADÃO

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of the United States

STRENGTHENING TRANSATLANTIC COOPERATION



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THE GEOPOLITICS OF THE NEW DIGITAL ECONOMY
FROM FORD TO GOOGLE

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By Alfredo G. A. Valladão¹

Introduction	1
The Rise and Fall of Fordism	2
The Digital Economy Revolution.	10
Conclusion	20

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1 INTRODUCTION

The financial and economic crisis that unfolded across the globe after the 2008 sub-prime meltdown was not just another cyclical bump in the conquering advance of modern capitalism. It was — and still is — a symptom of the exhausted 20th-century way of envisioning the best path to economic growth, consumer satisfaction, and efficient production of goods. Environmental limits to our race to prosperity are just part of the story. The other, and crucial, part is the ongoing technological revolution and its impact on manufacturing processes, the organization of production value chains, and on consumption itself. The analogic mechanical conveyor-belt, so prevalent during the last century, is rapidly being superseded by a new digital computational conveyor-belt. The consequences will be huge for the world's geographic distribution of economic activity as well as for the authority and perquisites of nation-states and governments.

Every historical social metamorphosis has its winners and losers. The new digital industrial economy will entail a new distribution of wealth and power around the world. Certainly, the old reality will not simply disappear. It will coexist with the new one but will be progressively subordinated to new logic and interests. It is amazing how in the course of a few years the likes of Google, Apple, Facebook, Amazon, and even the “old” telecom industry have overtaken the last century's giant corporations. Moreover, new players continue to pop up and threaten the recently established positions of these first giants of the Internet. Disruptions will indeed be pervasive. The new technological dynamics are already leading to profound changes regarding the beneficiaries of corporate, social, political, and geographical value-added. The million-dollar question is: who will pocket the bulk of the benefits of this new era?

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2 THE RISE AND FALL OF FORDISM

The Disruptive “American” Conveyor-Belt

One hundred years ago, in October 1913, Henry Ford launched the first moving assembly line, revolutionizing the whole production process as well as consumption patterns. By introducing a clear division of labor, dividing assembly procedures into different steps along a programmed workflow, and paying good salaries to its workforce so it could afford its automobiles, Ford inaugurated the era of cost-cutting, efficiency-seeking “mass production for mass consumption.” Progressively, “Fordism,” which echoes Frederick Taylor’s “scientific management” principles, became the world’s mainstream model for manufacturing and consumer markets. From Detroit in 1913 to Shanghai in 2013, the multiple avatars of this new way of producing and consuming things imposed itself — but not without occasional stiff resistance — as the economic cynosure for most of humanity.

Ford’s ideas didn’t come out of the blue. His industrial organization grew out of the first industrial revolution that swept through Britain at the beginning of the 19th century, reaching parts of continental Europe in the second half of the 1800s. The nearly feudal management of an array of single craftsmen before that period made way for the concentration of production into corporations that were hierarchically organized and used machine tools, coal and steam power, and mass-produced iron. It was a highly efficient model for that time, which coexisted with small-scale, labor-intensive, low-productivity firms. But most of this industrial production, big and small, was destined for niche consumer markets. Europe still had an aristocratic vision of economic growth where production was mostly geared toward public infrastructure, military projects, and the high-end consumption goods of the power elites (national and foreign), as well as a tiny new urban middle-class and skilled workers. Most people lived in the countryside and

only had access to basic, generally low-quality, locally produced goods.

The main feature of the “American” assembly line revolution was that it launched an unstoppable movement leading to the demise of craftsmen and farmers as central economic actors. This epochal social transformation was also made possible and magnified by innovative technological breakthroughs: electricity, the internal combustion engine, and oil as the main energy source. New technologies and ways of thinking led to the commoditization of labor. Unskilled workers were integrated into a system of standardized mass production that was highly automated and mechanized, and which was controlled by a “scientifically” organized management hierarchy. This new model of producing goods was nurtured by a parallel commoditization of consumption, thanks to emerging information technologies: radio broadcast, motion pictures, and later television. For the first time, it was possible to reach a whole nation with a single message and the same emotions at the same moment. Radio not only generated a deep transformation in how political leaders related to their constituents, it became the most potent instrument — along with movies — for mass advertisement and entertainment, giving birth to standardized national trends, fashions, and tastes. Everyone was made to feel the same — and to wish for the same “goodies” — at the same time.

Mass Production for Mass Consumption

In political and geo-economic terms, this new model was a potent agent of national integration. Domestic migrants fled the countryside — with its hard and monotonous social life — for the urban industrial clusters. Huge numbers of unskilled workers were concentrated and disciplined by the conveyor-belts, in a new cultural environment disconnected from local idiosyncrasies. Whether desired or imposed, such “displacements” were

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probably more important to the consolidation of national identities and dominant national institutions than the traditional “patriotic” wars. Big Government, Big Business, and Big Labor emerged as new instruments for promoting and organizing *national* production and consumer markets (even resorting to aggressive protectionism), and for managing the social costs of this immense metamorphosis. This socio-political engineering is still associated with the names of John Maynard Keynes and Franklin Delano Roosevelt. Local selfhood, power groups, and ways of life, as well as craftsmanship and “old” forms of organizing production did not disappear. But their *raison d'être* became subordinated to the new logic, economically as well as politically. This is akin to a profoundly disruptive social revolution: old elites and their economic power bases being displaced by a wave of Schumpeterian “creative destruction.”¹

The fact that this social upheaval started in the United States is not trivial. Disruption of vested interests was less problematic in a gigantic non-proprietary territorial space, still in the process of being occupied by flows of immigrants from different origins, where social mobility was very high and established ruling groups were not as strongly consolidated as in older societies. Moreover, the Civil War had already destroyed the powerful but archaic model of the agrarian slave-worked plantation and its entrenched elites. Additionally, the United States was less dependent on raw materials imports than other industrializing states. This unique situation — even compared to other important territorially extensive nations populated by immigrants like Brazil, Mexico, and Argentina — was the perfect combination for the success of Fordism as well as the “democratization”

¹ In *Capitalism, Socialism, and Democracy* (1942), Joseph Schumpeter coined the term “creative destruction” to denote “the process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one.”

of consumption and entrepreneurial freedom it entailed.

From the U.S. Great Lakes to the modern Yangtze River Delta, it took nearly a century for the “mass production/mass consumption” paradigm to conquer the hearts and minds of most people. The 20th century was marked by apocalyptic conflicts, ideological wars, the demise of empires, and the birth of more than 100 new national entities. However, after a strong — and painful — start in the United States, this new economic template was met with extreme skepticism by the ruling groups of the other independent powers of that time. Their preferences went to the “old” industrial model centered on heavy industry for public infrastructure and military consumption, combined with the production of high-end consumer goods for a limited class of customers. Access to raw materials was ensured by what boils down to colonial predation.

Lenin was a great admirer of Fordism, but only of its industrial production rationalization component. Freedom for entrepreneurs and an economy geared toward mass consumption and free choice was too much of a threat to the new Communist ruling class’ monopoly on power. The same can be said of the post-Meiji era power groups in Japan, who imported the first Western industrial revolution in order to guarantee their island’s independence by building well-equipped military forces, and to consolidate their own internal social position by raising a wall against dreaded competition from foreigners. Even continental Europe’s elites could not stomach broad domestic competition. During the first half of the 20th century, Continental Europe’s dominant economic model was mainly a state-sponsored industrial process.

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**Fordism on the Move:
The “Thirty Glorious” Years**

An economy where the most dynamic feature is free competition between many proprietary assembly lines is a demanding mechanism. Just to survive, it needs a growing consumer outlet for its mass production lest it drown under piles of unsold stocks and diminishing returns. This can be achieved by expanding to new pools of clients, domestic and foreign, and/or by churning out ever-cheaper goods so that more people can purchase them. “Productivity” is the name of the game, and “consumer confidence” the sub-text: the conveyor-belt logic requires a permanent rationalization of the production processes in order to keep cutting costs, as well as a constant effort to maintain enough quality to remain competitive. This model is therefore extremely hungry for credit — both for consumers and producers — and for innovations (new technologies, new products, and new ways of organizing and managing production). Its Achilles heel is its vulnerability to any slow-down of one or more of its constituent elements. After becoming the beacon of a “national” (U.S.) economy during the 1920s, this model collapsed during the 1930s, the victim of the credit crisis, mass unemployment — with its consequent contraction of the consumer base — and the reactive beggar-thy-neighbor trade policies adopted by all the main international players.

World War II was a game changer. Paradoxically, the world conflict saved the U.S. mass production/mass consumption model, and created the conditions for its offshore expansion. First, the horrendous financial, as well as fixed and human capital devastation created a huge and dynamic “reconstruction” market, also boosted by the post-war baby boom. Second, a big chunk of continental Europe’s traditional political and economic elites was literally wiped out, physically and economically, opening the way to new,

upwardly mobile and less-cemented power groups — a disruption at the top levels of power that was less clear in Japan. Third, there was no possible economic resurgence without U.S. aid and capital. The precondition for benefiting from the Marshall Plan was the adoption of the new open-trade, competitive, consumer-led production model.

The decolonization processes (ambiguously supported by the Eisenhower administration) and the consequent loss of the monopolistic certainty of cheap access to raw materials accelerated this epochal change. For the first time in centuries, a strong dose of economic competition could be injected into most of the world’s basic commodities trade. For Europe and Japan, imperial rentism had to give way to a more “rational” and less distorted management of supply flows and prices of natural resources in order to stand up to the competition of the gluttonous U.S. post-conflict growth engine.

Post-war Western Europe, when it discovered affordable household appliances and automobiles — and with credit flowing to businesses — followed its transatlantic ally’s lead and happily joined the “consumer society.” Mass production assembly lines assured plentiful jobs and better wages in factories and services. Flows of people leaving the countryside for urban centers, as well as TV broadcasts and thriving film and music industries, had the same effect as in the United States three decades earlier: the emergence of “national” and sometimes international mass culture and tastes, steamrolling local or regional roots. The establishment of the European Economic Community, in 1957, provided for the requisite of a sizeable “domestic” consumer market for goods that single member states could not deliver alone. However, Old Europe’s farmers and its myriad statutory service providers could not — and still cannot — swallow such a level of economic openness. Despite their economic integration process, Europeans embraced this more competitive

way of life only half-heartily, building an array of political and regulatory roadblocks to slow down its expansion and to forestall their customary domestic social confrontations. This compromise goes by the name of “social market economy.”

On the Pacific Rim, Japan — and later, the first Asian “tigers” — benefited from analogous, if somewhat peculiar dynamics. The progress of Japanese post-war production from heavy industry to flourishing consumer goods mirrored that of Europe but with a 15-year gap. Extremely poor in raw materials, the Japanese could only prioritize boosting productivity and cutting costs. But intense rationalization of manufacturing was not enough without a huge outlet for the goods that were so efficiently produced — and Japan’s internal market was too small and too rigidly protected to play that part. However, as a political move during the Cold War, Japanese products were given better access to the biggest consumer market of all: the United States. Indeed, facing the challenge of Soviet and Chinese “real socialism,” Washington decided to support the success of its Asian allies’ market economies. Thanks to this fairly unilateral “political economy” blessing, the Japanese and some other Asian power elites could sustain economic growth while affording to postpone the acceptance of domestic competition.

The European and Japanese conversion to the mass production/mass consumption cycle — domestically centered or export-led — paved the way to a new historical, more integrated and urbanized, geo-economic environment. In a world paralyzed by the East-West nuclear standoff, the “trilateral” West was born — and thriving. After half a century of wars, the “Thirty Glorious” years — from 1945 to the first oil shock in 1973 — had a dreamlike glow for this privileged part of the planet: record economic growth rates, jobs aplenty, the onset of mass education, and enough resources to finance a generous welfare state. A growing “middle

class” became the symbol and the engine of these new more open, rich, and democratic societies, which were less socially polarized. Prosperity was so pervasive that the “baby boomers” could afford to rebel against “consumerism” and “materialism.” This whole process also benefited strongly from low prices for raw materials. Newly independent states in Africa and Asia in need of revenues, combined with new investments in mining, agriculture, and oil, bolstered competition and the availability of these commodities on the world market.

The Peak of “National” Fordism

This second wave of expansion of the assembly line logic — the first one being the integration of the U.S. domestic market — was translated in political terms with the formation of the G7 in 1975-76. This annual gathering — informal at first — of the heads of state of the seven most powerful industrial Western nations was supposed to acknowledge the new levels of interdependence and the need to together start managing the black clouds amassing over the world economy. Indeed, even before the 1973 oil shock, the Western consumer markets, awash with goods, were progressively reaching a peak. In order to stay in business, the big mass production companies had to look for new wells of consumer purchasing power, either by opening new markets and/or by making their products more affordable — or more desirable — for new clients in their “old” markets. The first main consequence was the birth of the modern “multinational” and of a new trend of cost-cutting and product innovation strategies: spread out or fade away. Western and Japanese corporations set about establishing their presence not only in each other’s national markets but also outside the G7, particularly in some promising Latin America countries and the few newly industrializing nations in Asia (Korea, Taiwan, Hong Kong, and Singapore).

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The never-ending drive to cut costs while maintaining quality reached its zenith with the implementation of the Toyota production model. The Japanese carmaker pushed the radical reduction of waste and the intense rationalization of the assembly line to new heights: “just in time” lean production, customer-driven fabrication, strong interactive relationships with outside suppliers, and teams of workers playing a central part in improvements and quality control. As many other big companies adopted more or less analogous schemes, this intensely sparing production organization quickly hit a double obstacle: dwindling elbow-room for further in-house assembly line waste-squeezing and the gradual stagnation of Western consumer markets. Ferocious competition for market share pushed multinational corporations to seek new ways for staying alive.

The race to outpace one's challengers involved three non-exclusive strategies. The first was to find new pools of very cheap labor and more lax regulatory constraints in developing countries. The second was to use the first generation of mass-produced information and communications technologies (ICT) to rationalize the universe of services, administrative tasks, and the management structure itself. The third was to quicken the pace of product and process innovation in order to climb the value-added ladder faster than the competition. The “multinational” firm of the 1970s and 1980s morphed into the “transnational” global corporation, a born-again venture made possible by an epochal information and transportation revolution led by the personal computer along with a fledging Internet network, and the proliferation of large container ships as the main feature of non-bulk maritime trade. But something was missing: the global producer was still in need of a global mass consumer.

With the end of the Cold War, several factors combined to liberate a humongous pool of new customers and new available workforce: the opening of the former Soviet bloc economies, the adoption of market economy principles by most of the developing world, and China's conversion to a peculiar form of aggressive command capitalism. The proliferation of global television and social networks connecting a big chunk of humanity to the same emotions, fads, and ads had a tremendous impact, as huge as the invention of the mass-audience radio in the first decades of the 20th century in the United States. But now, standardization of tastes and trends was happening at a planetary level. Henry Ford's vision enjoyed a new lease on life.

The Post-Cold War Global Assembly Line

This third wave of Fordism could no longer be contained by the straitjackets of national borders. The West's financial system had to follow the credit and investment needs of its big corporate customers. Moreover, most governments of industrialized powers started to raise funds on sovereign debt markets in order to pay for stimulus packages intended to prop up their flagging domestic economic growth and consumer appetite. Necessity — economic *and* political — led to financial creativity and deregulation, creating a seamless world financial industry, less and less controllable by national authorities. Concurrently, the fragmentation and trans-nationalization of assembly lines gave birth to the present global supply chains, a sort of “exogenous” conveyor-belt that encompasses a plethora of independent intermediate producers and service providers. The stand-alone global corporation became more and more a driver and a coordination platform for its subcontracted and internationally scattered operations, such as physical production, services, management, financing, marketing, etc. It actually relinquished its original geographic roots,

distributing its investments and plants according to the different advantages that each market or country could dispense. National spaces are now viewed only as a way to enhance the efficiency of the firm's chain of value.

In the last 20 years, this worldwide integration of financing, production processes, and consumer tastes materialized into a new geo-economy. The fragmentation of supply chains favored territorial specialization and created “niche” opportunities, captured by emerging economies such as Brazil, Russia, India, and China (the BRIC countries). China, with its enormous pool of cheap labor, became the world's biggest hub for end-product manufacturing. The Chinese assembly process benefited from its deep integration into global value chains, importing raw materials from Latin America, Africa, Australia, and the Middle East, as well as parts, components, and technologies from Southeast Asia, South Korea, Japan, Germany, and the United States. Western, Japanese, and Taiwanese firms based in China, as well as some mainland companies, assemble these elements into very competitive finished products that are mostly exported to the old Western industrialized markets. Brazil fared well during the first decade of the new century, mostly because of high demand and high prices for its commodities exports, a large part of which (iron ore and soya) was shipped to feed China's economic engine. The surpluses engendered by this raw materials bonanza allowed the successful redistributive social policies of the Fernando Henrique Cardoso and Luiz Inácio Lula da Silva governments, which boosted Brazil's domestic market growth. India profited from the outsourcing to low-wage environments of many industrialized countries' ICT services sectors, which are indispensable for the workings of the global economic machine. As for Russia, its growth rate is entirely linked to the price of its

hydrocarbons exports and the world's capacity to absorb them.

These various “niche” strategies inside the global value chains were successful enough to nurture the emergence of bulging BRIC middle classes craving those universal goods so pervasively advertised by the global and local audiovisual industries. Many high-end producers in the old industrialized economies, particularly those specialized in luxury or sophisticated capital goods, could also benefit from the buying spree of the better-off amongst the new developing countries' consumers. The engine of mass production for mass consumption could roar again, but at a globally interdependent scale. Now, these piles of final products churned out by the transnational production belt have to keep being bought somewhere. In current dollar prices, the U.S. and European markets represent around one-third each of the world's final private consumption. Add Japan and other industrialized economies and we are close to 75 percent of humanity's private consumption. China, in spite of its economic prowess, represents less than 5 percent — a level that by itself would be totally inadequate to sustain the country's internal growth rate or the “niche” strategies of its BRIC partners. Indeed, the ongoing prosperity of the “emerging powers” is intimately linked to the good health of Western economies.

The Great Political and Environmental Walls

In the first decade of the 21st century, the original U.S. Fordism and its national embodiments in Europe, Japan, and some Asian “tigers” morphed into “global Fordism,” subsuming the whole planet in one way or another. The transmutation was rapid and sweeping, but it soon hit a formidable wall. The 2008 sub-prime financial meltdown and the ensuing global economic crisis were the temporary material expressions of this brutal crash. The race to deregulate the financial markets, traders'

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“creativity,” securitization of mortgages in order to expand the real-estate market, adventurous business practices, or governments accumulating debts and budget deficits were only desperate ways of seeking to push the structural limits of the Fordist model, boosting growth by artificial means. But the real big stumbling block had two dimensions: environmental and deeply ingrained socio-political limits. Human contribution to climate change has become a central issue for the international community. The “airpocalypse” in some polluted Chinese cities or the increase in devastating natural disasters have clearly demonstrated what humanity’s future may look like if another 2 billion people were to join the ranks of compulsive consumerism. But who can deny a better life for the growing number of poverty-stricken individuals that have an actual chance to leave misery behind, and on what moral grounds?

Just as intractable as the environmental issues is the strong resistance by established power elites in big emerging countries — and also in many parts of Europe — to heighten economic and political competition in their internal markets. Transnational finance, production, information, and communication have seriously reduced the capacities of governments and national institutions to exert control over their national constituents. Political and economic ruling groups are turning into local managers of a global logic, which is increasingly out of control. Even local businesses have become directly or indirectly dependent on faraway decision-makers not always clearly identifiable. All these national vested interests dread this slippery slope toward irrelevance and are resisting. They are ready to fight back in order to prevent being submerged by a new dynamic breed of domestic *scalawags* and “foreign” or stateless *carpetbaggers*.

Yet, without substantially opening the domestic market and welcoming overt political competition,

new technologies that would enhance the country’s competitiveness will not emerge. Credit availability, for businesses and consumers alike, will continue to be distorted by cronyism and corporatism, seriously hampering innovative investment and consumption growth. Ambitious start-up ventures will not be able to challenge the established players. Any attempt to reform or simply update national institutional regulatory frameworks that protect vested interests will become ever more costly and intractable. In sum, “creative destruction” — so critical for the survival of the Fordist mass production/mass consumption model — is being tamed to the point that it may stop altogether.

Japan, since the beginning of the 1990s, has lived through this scenario of economic and political stagnation, and the recent “Abenomics” is still just a drop in an ocean of political, social, and economic conservatism. The BRIC countries are stuck in the same dilemma. As Chinese Communist authorities watch their country’s most important export markets (the United States and Europe) shrink and their GDP numbers drop, they have publicly acknowledged that they must reorient their growth model based on foreign sales and a splurge of infrastructure investment toward internal production processes geared to domestic consumption. But this epochal transformation for a country of 1.3 billion people entails dramatic economic and financial liberalization, juridical predictability, a smaller state presence in economic activities, and large social security transfers, all of which directly challenge the Chinese Communist Party’s power and its control over economic actors and society in general. The reform plan that prioritizes “market forces,” announced in November 2013 by Chinese leadership, looks bold on paper. Yet, it is still a very long-term endeavor, presumably held hostage by the Communist Party’s desire to preserve its monopoly on power.

In India, the regional sub-national elites are so entrenched that most attempts by the central government to promote more openness and liberalization have hit the impregnable bulwarks of the state bureaucratic apparatus and local provincial vested interests. Russia's authoritarian and close-knit crony power structure hinging on hydrocarbons and arms exports has no incentives to encourage domestic competition. Even Brazil, which benefits from a thriving democracy and a relatively open market economy, is struggling to leave behind its growth model based on natural resources exports and an explosive and unsustainable domestic consumption driven by state credit and revenue redistribution schemes. The stagnating Brazilian economy needs a "competitiveness shock": huge infrastructure and education investments, regulatory and fiscal overhaul, and less heavy-handed state intervention in the economy, a reform program that threatens the cozy relationship between a few established business groups and public sector officials linked to political party clienteles.

In Europe as well, not many national power groups have had the stomach for launching the long overdue "structural reforms." Most European countries — particularly Southern ones — embraced debt-dependent stimulus policies when faced with overall loss of competitiveness vis-à-vis their global economic partners, a surging unemployment rate, and dwindling consumer purchasing power. This choice had the advantage of boosting short-term growth while avoiding the politically explosive issues of tackling head-on the financial limits of the welfare state, the dismantling of a myriad vested corporatist benefits, or the serious remodeling of stifling labor and business regulations. The 2008 economic crisis exposed the unsustainability of this procrastination. Since the sub-prime meltdown, Europe has been practically at a standstill or worse, with the exceptions of Germany, Poland, and Britain. Without the pull from the Old Continent consumers, and with the U.S. market only slowly recovering, many global assembly lines deprived of final outlets are gradually petering out.

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3 THE DIGITAL ECONOMY REVOLUTION

The Birth of the Virtual Conveyor-Belt

Global Fordism is stuck in the dead-end of climate change and the conservatism of most power elites. Paradoxically, those national ruling groups, so keen on defending their prerogatives, cannot but seek further integration into the transnational chains of value. It is indeed the only way to sustain strong economic activity in one's national territory, which is the basic *sine qua non* condition for acquiring at least some measure of independent decision-making capability. A return to the "good old days" of sovereign control over the economy is a nostalgic dream — if it ever was a reality. Autarchy, today, is not an option. Paradoxically, in order to consolidate their social power, national elites are obligated to become more and more dependent on a global financial and economic machine they cannot control. That means they have to accept a much more competitive domestic social compound, with serious risks of being displaced by the modern version of the *homines novi*: the upwardly mobile, non-establishment economic actors and their political representatives. For now, their answer is: "no way"! To relinquish command is the equivalent of political — and social — *hara-kiri*, and no current power establishment has a taste for *seppuku*. The snake bites its own tail, and the world economy barely manages to stay afloat.

The G20 process, re-launched in 2008 and touted as a new symbol of "global governance," was actually an attempt to showcase the capacity of the national leaders of the most important economies to face up to the challenge by working together. In fact, half a decade later, its relevance has been steadily dwindling. Its contribution in tackling the global crisis and reorganizing the world order is modest, at best. Its main practicality today is to transmute the ruling groups of new emerging economies into willing stakeholders of the sputtering economic world order, integrating

them progressively into its canons and basic rules, and preventing disruptive go-it-alone initiatives. Indeed, since the first meeting of the "new G20," all participants have dutifully subscribed, in every preamble of the summits' final declarations, to the whole catechism summarizing the fundamentals of the present global liberal order. This "plurilateral" scheme has at least prevented a deadly escalation of beggar-thy-neighbor policies and has partially succeeded in holding together the post-World War II international order.

However, the stalling of the global conveyor-belt is not the end of history. The last hurrah of mass production for mass consumption was made possible by the incorporation of first- and second-generation ICT. But these new technologies have acquired a life of their own. The unprecedented intertwining and growing convergence of Big Data, cloud computing, the Internet of Things, 3-D printing, advanced robotics, and global social media are at the heart of a new "industrial" revolution, as disruptive and overwhelming as the one at the beginning of the 20th century. As a matter of fact, the world is undergoing an epochal transition toward a global "digital economy" predicated on what some are already calling the "Internet of Everything."²

Silently, but faster than the main economic players realize, the classic assembly line — even in its present geographically fragmented version — is being superseded by a new "virtual conveyor-belt." The Internet has been connecting people for nearly three decades, but now the rush is to interconnect things. Every object — from end products and components to batches of raw materials — will become uniquely tagged in order to be manageable

² See, for example, Tim Bajarin, "The Next Big Thing for Tech: The Internet of Everything," *Time Magazine*, January 13, 2014. Cisco, "The Internet of Everything: How More Relevant and Valuable Connections Will Change the World," <http://www.cisco.com/web/about/ac79/docs/innov/loE.pdf>

Silently, but faster than the main economic players realize, the classic assembly line — even in its present geographically fragmented version — is being superseded by a new "virtual conveyor-belt." The Internet has been connecting people for nearly three decades, but now the rush is to interconnect things.

by computers. The Connections Counter of the California high-tech firm Cisco Systems is predicting 50 billion devices and people will be connected by 2020, and continuing at a swiftly growing rate, taking advantage of a 25 percent annual decline in connectivity costs. This massive interconnectivity parallels an equally impressive development of virtual representations and simulations of production processes, often in real-time. “Cyberobjects” and their “real life” robotic counter-parts can be programmed to organize and supervise physical manufacturing. Each actual “thing” will eventually be able to dialogue with another, and it is likely that “real” people and organizations will be operating at a distance (via remote control) and interacting anonymously (via cyber avatars). Meanwhile, it seems that each and every transaction (whether by things or people) will be registered and “edited” inside a cloud of massive software environments capable of processing huge amount of data (“Big Data”). This will introduce enormous flexibility to a production model where connected objects could deal autonomously with real world events and engage with their virtual representation, generating new actions and even new services.

A production process linking real-time online monitoring of its customers, Big Data treatment, and interactive information flows from manufacturing components would be able to spot new usages of its products. This data stream, linked to the manufacturing algorithms, would then automatically design a new cyber prototype incorporating new features as well as a new fabrication procedure. The recent Tesla/Telefónica partnership or the Mercedes-Benz S-Class are good examples of how the automobile industry is already programming an all-connected car that would be able to drive innovation in goods and services.

Commoditization of Manufacturing Processes

The novelty is that this large automated and interconnected “*City of Bits*,” so colorfully anticipated by William Mitchell in 1996, is not meant to run a single production line churning out a limited sort of end products. It is radically different from a Fordist assembly line. This “meta-software,” run on a distributed dynamic virtual platform (the “Cloud”), will become the soul of a virtual conveyor-belt that generates countless product designs that can be fabricated on a range of scattered flexible manufacturing plants where every part and component can be programmed and reprogrammed to adapt to each procedure. The whole process, from the raw material inputs to the end consumer, will be computer-led, and the end product could be either customized or mass-produced for distinct markets of final consumers. This production versatility is possible thanks to the striking breakthroughs in digital/physical fabrication. 3-D printing is emerging as a seriously competitive machine tool for prototypes and low-volume series production. Taking advantage of a spectacular fall in prices, it is also on track to become a generic household appliance. This is leading to a “democratization” of manufacturing implements that opens the path to significantly cheaper individually customized goods.

This flexible environment is being boosted as well by breathtaking progress in robotics. Computer-controlled machines are currently able to quickly shift from one pre-set configuration to another, drastically reducing setup times for manufacturing new items. High-volume, single-model producers will have to cope with strong competition from leaner operators using advanced robotics and the interconnection of “things” to offer permanent rotations of product variety, shorter production cycles, small inventories, and automated quality controls. The fact is that new manufacturing technologies, and their cost-cutting

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consequences, are rapidly diluting the advantages of size, economies of scale, low labor costs, and a committed plant workforce. The “global Fordism” practice of closely integrating and organizing suppliers around one’s own value chain is likely to be displaced by the possibility of these same suppliers to sell directly to the new production “cloud,” thereby optimizing the way information and materials are shared. Industrial design — the “look” of an object, but also “immaterial” inputs and even manufacturing or marketing procedures — is fast becoming the center of a company’s value-added.

The whole manufacturing process is progressively being transformed into another “commodity” that can be bought at global market prices by anyone, small or big firms, established ones or new entrants. The economic effects of this leveled playing field are enhanced by the development of “digital financing.” “Crowdfunding” is still in its infancy, but its use for financing business, humanitarian, artistic, or even personal projects is growing fast. This “democratization” of credit could potentially bypass the traditional and regulated financial system players.

“Customized” Mass Consumption

“Customized production” is on its way to overtake “mass production” in the next ten to fifteen years, but it still needs strong consumer markets. However, the “digital economy” might be finding a way around this dilemma. The growing manufacturing productivity means more affordable goods for a global “middle class” with stagnating revenues. With today’s social media, fashion and tastes can quickly become massive, but will have much shorter life spans. Good offers can go viral and rapidly become global hits.

Therefore, one of the defining features of the new economy could be an incessant ebb and flow of

monopolistic positions, supported by recurring and ephemeral “customized” mass consumption bursts. The capacity to analyze customers’ changing tastes and expectations is fast becoming an essential element for producing goods and services. The troves of personal data transmitted and collected through our array of connected devices are being monitored and processed by data aggregator outfits, building cyber profiles of each customer that can be exploited by networks of firms, institutions, and personal exchanges through focused and interactive advertisements, creating what some are already calling “digital ecosystems.”³

Of course, customized consumption will not put an end to mass consumption. Instead, it will likely conquer a big chunk of the old Fordist markets — particularly in the more demanding, better equipped, and richer societies of established industrial powers as well as in more affluent segments of the emerging urban middle-classes in the South. Traditional measurements of economic growth and prosperity will tilt toward household consumption of more services and fewer “goods.” In a “digital economy,” services — and immaterial components like design and innovation — will become crucial drivers even for basic manufacturing processes. The 2013 WTO-OECD research in trade in value-added (TIVA) has already showed how the importance of services in the end-value of goods in global value chains is grossly underestimated. Hence, the new model of “distributed digital production/ customized consumption” can be expected to capture progressively larger portions global value-added, seriously weakening the profitability of the “mass production/mass consumption” paradigm. The latter will continue to serve the remaining requirements by the mature markets for

³ World Economic Forum, “Digital Ecosystem — Convergence between IT, Telecoms Media, and Entertainment — Scenarios to 2015,” Geneva 2007.

standardized mass products at low prices. But its further lease on life is predicated on the uncertain expansion of a less demanding consumer base in developing countries.

The digital conveyor-belt may be able to bypass the present cresting of demand in the old industrial economies and to relaunch the growth machine. However, the environmental challenges are still there — the main issue being the planet’s energy matrix and the threat posed by climate change. The U.S. shale gas “revolution,” thanks to current hydraulic fracturing (“fracking”) techniques, could be one technological solution, in addition to solar panels, electric cars, biofuels, etc. However, aside from an unpredictable scientific breakthrough — like controlled nuclear fusion — reducing greenhouse gases will likely be made by energy savings. Today, these savings typically come with a label: “smart.” Smart grids, smart cities, smart homes, smart industries, and smart trade have the potential to significantly increase energy efficiency, but they require interconnectedness and huge computing capacity. The digital economy alone will probably not stop global warming, but for now it is still the only serious framework available for trying to do so.

Privacy: An Anomaly?

However, there is no reason to look upon digital conveyor-belts with Pollyannish awe. There is no free lunch, and every economic pattern has drawbacks. Today’s digital, interconnected economy is drifting inevitably toward the automation of decision-making. Technology has already reached a point where a military drone could be fitted with software that can sort out potential targets and shoot at them without any human involvement. These kinds of automatic judgments are slowly sneaking into everyday life. The “Internet of Everything” could soon deliver fridges that can monitor and analyze one’s eating habits, as well

as order new groceries paid for by automatically debiting personal bank accounts. This capability will surely be connected to public health standards and one’s own health records, with personal monitoring devices (some already popular) that could define what kinds of foods you are allowed to eat or are prohibited from eating, and how many steps a day should be walked so as to stay healthy. The ability to impose customized bans is not far off, nor is compulsory intake of medicines. A smart home that is able to anticipate energy and water consumption needs — and cut utility bills — could be linked to the algorithms of smart grids or smart cities programs in order to “optimize” individual behavior.

Google’s Vinton Cerf, one of the Internet’s fathers, summed up what the new era is all about: “privacy may actually be an anomaly.”⁴ The brave new world of digital economy is founded upon a paradox: customization of private consumption and creeping standardization of private conduct. In order to enjoy infinite choices of goodies, one “has” to accept being submitted to pervasive automated control. What form of political organization would be congruent with this production model? Will freedom and democracy be driven by algorithms?

The Age of Inequalities

Before maturing — in perhaps 15 to 20 years’ time — the new “digital production/customized consumption” paradigm will aggravate the present trend toward greater social inequality. Historically, every epochal economic disruption has eventually led to new types of jobs, services, and consumer habits, and to new ways of accessing and enjoying “happiness” and prosperity.

⁴ Vinton Cerf, Keynote speech at the U.S. Federal Trade Commission “Internet of Things” Workshop, November 19, 2013, Washington, DC.

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A global interconnected society requires core technical foundations: operational standards and the continuous generation of central algorithms. Without these elements, all present and future players of the digital economy, both firms and individuals, will be unable to function. But standards and algorithms are increasingly the prerequisite of very few firms, like Apple, Microsoft, Cisco, and Google. The entry cost — capital investment and accumulated knowledge and know-how — of building such broad and encompassing platforms is so steep that competition in this narrow playing field will likely remain muffled. In an economic model where even the physical fabrication process turns into a non-proprietary commodity dependent on a meta-software, those who think and design the architecture of this “Internet of Everything” will pocket the biggest chunk of the global value-added. These “Masters of the Algorithms” and their ambitious retinue of designers, innovators, process developers, apps framers, and systems mathematicians are likely to accrue greater economic and political power in the coming years.

ICT did not invent inequality, but it is becoming the main scapegoat for the angry cohorts of erstwhile well-paid and well-employed middle-income workers in the Western industrial powers. However, this new digital world will inevitably create many losers and a few big winners. The present transition from one era to another cannot avoid serious social and political strains. The current geo-economic and geopolitical paradigm is shifting, and the most adventurous of the digital natives generation will likely capture a disproportionate share of the gains. Those left behind — the “old” middle-classes and “old” business interests as well as the educated unemployable youths — will likely resist. It comes as no surprise that some new giants of the Internet economy are already being viewed by many as contemporary “robber barons.”

The digital economy upheaval will also have far-reaching geographical implications. A world marketplace with seamless interconnectedness is slowly eroding the benefits of having a huge — and more or less protected — “national” market. Business production and marketing can increasingly skip consolidating a local clientele and “go global” directly. Online retailers and services, as well as 3-D printers, are already freeing consumers from overreliance on national providers, including in some previously non-tradable categories — like “printable” spare parts or medical appliances and diagnosis. International trade is also undergoing a revolution of sorts. Digital production can drastically reduce the need for transporting spare parts and even a growing number of components, which represent the biggest share of today’s international trade. Services, increasingly incorporated into goods or sold directly through the Internet, are on their way to supplant the exchange of tangible products. With the commoditization of the manufacturing process, the advantages of exploiting far away pools of cheap labor are dwindling. Transport and insurance costs, as well as the difficulty of quality control at distance or time lags between ordering and deliveries, have become main variables of end-product market competitiveness.

TTIP versus WTO

Obviously, the global fragmented production chains will not simply disappear, but they will have to cope with increasing competition from “relocated” manufacturing. Thanks to technological progress — and a costlier labor force in China — production end-costs for a growing number of industries are now lower in the United States than in Shanghai or Guangzhou, at least if the end-market is North America. Briskly passing fads and short product life spans are compelling the big transnational companies to geographically distribute their end-operations in order to achieve close interaction

with each sort of consumer base and culture, at the expense of their much slower, standardized transnational value chains. This relocation trend is not renationalization, but an adaptation to the fact that global — and transnational — virtual conveyor-belts will increasingly move information rather than physical goods. Interconnected closeness to each specific buyer-market is emerging as the best recipe for simultaneously tapping volatile customized local demand and bursts of customized global demand.

At the close of the Fordist era, 80 percent of world international trade is the preserve of multinational companies, and stocks of foreign direct investment — particularly in transnational chains of production and their supporting services — represents nearly one-quarter of the planet's GDP.⁵ Most of this global crisscrossing of goods (finished and semi-finished, parts and components, and commodities) is ruled by bilateral and regional trade agreements, and the multilateral framework of the WTO. The Doha Round negotiations were supposed to complete and guarantee the governance of global Fordism exchanges. But today, these multilateral talks are stalled because they are in fact negotiating the past. The ongoing digital revolution is starting to disrupt the entire fabric of world commerce.

The trend toward geographically distributed relocalization of productive units, fed by virtual prototypes and services, will progressively transform trade flows. Long-haul shipping of finished products will slowly dwindle, at least with regards to the better quality or “customized” products destined for the more “digitally savvy” markets that can take advantage of the new technological breakthroughs in manufacturing

— such as North America, Europe, Japan, and Australia. Together, these regions host the biggest percentage by far of the planet's consumers. That will unsettle the whole transportation network of parts, components, and spare parts. Even basic raw materials exchanges will likely have to adapt to this new situation, which would mean accepting more targeted orders and a greater reliance on spot prices. Short-haul transportation with flexible schedules will probably become paramount in order to serve the constantly adjustable patterns of virtual conveyor-belts. Ultra-large and efficient container or bulk ships will not disappear, but smaller, faster and less specialized ones will become crucial, fostering a new port geography favoring proximity to the most important consumer-bases — Western nations and upper middle-classes in the richest regions and cities of developing countries. Still, these digital economy trade flows and manufacturing will coexist with more traditional mass-production transnational value chains. As many poor regions of the world start climbing up the “middle-class” consumer ladder, the global Fordism assembly line will still play an important role in providing these “middle-markets” — and also pockets of poor consumers in rich countries — with cheap, “good-enough” products.

Surely, this new economic model will need new rules. The usual combination of preferential agreements based on tariffs and quotas is inadequate for Internet-driven trade, where moving bytes are slowly supplanting moving physical goods. Services and “behind-the-border” regulations such as standards, intellectual property rights, and investment regimes are the main issues facing the digital economy. It is therefore unsurprising that the United States — the most advanced “digital player” — is the one pushing for new “deep integration” trade pacts covering these regulatory questions, especially the Transatlantic Trade and Investment Partnership (TTIP), the

The ongoing digital revolution is starting to disrupt the entire fabric of world commerce.

⁵ UNCTAD, *World Investment Report 2013 — Global Value Chains: Investment and Trade for Development*, United Nations, New York and Geneva, 2013, p. 135; OECD, *FDI in Figures*, Paris, April 2013, p. 7.

Plurilateral global agreements on regulations and standards will likely become the global benchmark for the new digital industrial revolution, with the risk of favoring countries who are parties to the agreements over those who are not.

Transpacific Partnership (TPP), and the Trade in Services (TiSA) talks. Deep cooperation between the United States and the European Union, the two biggest economies in the world, will be a game changer even if only some TTIP negotiating goals are achieved. The parallel TPP discussions could further alter global trade if they can bring on board the most dynamic economies of North America, Pacific Latin America, and East Asia (minus China for the time being). If successful, such plurilateral global agreements on regulations and standards will likely become the global benchmark for the new digital industrial revolution, with the risk of favoring countries who are parties to the agreements over those who are not, confining WTO rules and dispute settlement procedures to those that will be left out and to traditional assembly line trade.

Winners and Losers

If the United States, with Europe and Japan close behind, are at the heart of the new times, it does not mean that most of their own populations and regions will be winners. There are demanding conditions in order to be successful in the digital economy: a highly educated workforce, top academic institutions and advanced research centers, dynamic research and development clusters, pools of venture capital, stable rules and juridical predictability, the best ICT infrastructure and freedom to communicate with anyone on the planet, a reasonably policed and disciplined population, and, most importantly, support for risk-taking entrepreneurs and acceptance of unsettling competition. Such combinations can only develop to their full potential in sophisticated urban centers located in relatively stable, secure, and open societies. The big winners will be a few high-performing metropolises, extremely well connected and interconnected at the global level. Second in line will be lesser urban centers with good connection infrastructure and specialized

digital activities and niches. They will thrive as part of the big cities network, like dynamic satellites. Ambitious individual innovators with access to the global net, and not necessarily residing in the two former urban spaces, will also be part of the digital economy's pith.

The rest will have to survive with a slowly dwindling share of global value-added. Performances of countries reliant on world prices of raw materials will keep with the traditional "chicken-flight" pattern: an alternation of optimistic gold rushes and somber economic depressions. Regions in the developing South — and in less affluent parts of the North — will have to stick with old-style fragmented assembly lines churning "good-enough" mass products — a modern version of sweatshop societies, but delivering diminishing returns. A few lightly connected communities or societies might live more or less comfortably on local resources. And finally, a significant portion of humanity is still doomed to a life of indigence. As a matter of fact, this new distribution of global wealth is already working as a catalyst for another urban boom: poor rural inhabitants migrating to big cities, particularly in Asia and Africa. In 20 years' time, most of humanity will try to make a living in mega-cities, most of which are still unequipped to serve these swelling populations.

A new and more radical form of coexistence of clusters of prosperity with poor, stagnating social spaces inside the same nation-state — in the South *and* in the North — could have deep political consequences. In the transition period to the digital economy, governments will struggle to guarantee an acceptable wealth distribution across their national territory. The central bureaucracies' instruments to influence and even to monitor the economy have been eroding fast, while their taxing power and ability to raise long-term debt have been waning. It is extremely difficult to plan government actions and to maintain sovereign

control over a fragmented polity already connected to the whole world, and with an economic system where information flows are taking the upper hand. Global finance and production processes are slipping out of national states' hands. The trend is unmistakable: the state's function of compensating for domestic regional disparities and providing a social safety net is grinding to a halt. Social security is progressively being replaced by non-governmental charity and new forms of collective self-help made possible by the use of the Internet and social media.

New times are generating a new distribution of political power. National governments are slowly retreating to their core function: law and order, and external security. Everyday administrative power, social policies, economic incentives, and local security are progressively devolving to or being taken up by city and/or sub-national regional authorities, some are even undergoing full privatization. Increasingly, city halls or provincial and state governments are defining their constituencies' social and political frames of reference; some are even developing a "foreign policy" of their own. The cooperation agreements signed by the state of São Paulo with the U.S. and U.K. governments are the most recent and significant example of this trend. Secessionist dreams, present not only in crisis-torn developing countries, but also in Europe and North America, testify to this ongoing new organization of political power in the age of global interconnectedness. More urban and local "participative" democracy, managed by local political representatives answering to their local networked constituencies, are increasingly following their own laws, not always necessarily in harmony with "national" law.

The Atlantic Century and the Pacific Slowdown

In geographic terms, this epochal economic transition represents a challenge to those countries that prospered by adopting Fordism more recently — particularly the so-called "emerging markets." Their success is hampered by the fall of Western markets' mass consumption. The new "distributed digital production/customized consumption" model will further reduce their customer base. China is trying to pivot its economic growth toward the domestic market, but the Fordist model can only keep running if consumers are both free and have the means to consume massively, and if free competition between innovative entrepreneurs exists. This last point is even more important if the Chinese want to be part of the digital revolution. For the time being however, the Communist Party and its extensive network of vested interests can only follow a slow reform path. In fact, China is threatened by the growing obsolescence of its production model and by the curse of getting old before getting rich. India, Turkey, South Africa, and Indonesia are facing the same conundrum: to either open up to domestic and foreign disruptive innovation and competition, or to maintain the advantages of the power elites within a decreasingly productive and prosperous economy. In addition, India and China have a still more intractable problem: freeing economic actors can seriously weaken political control, which is an essential condition for maintaining national territorial unity.

The same threat of stagnation hovers over the geographical production clusters specialized in providing parts and components to the global value chains (particularly those that have bet the house on supplying Chinese assembly lines). However, South Korea, Taiwan, and other South or Southeast Asian countries are smaller than India and China, and they benefit from somewhat less rigid power structures. They have a better chance

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to adapt their particular production chains to the remaining developed markets’ “classical” lines and to new Fordist manufacturing in emerging Africa. They are also flexible enough to find niche opportunities in the new digital economy. As for countries dependent on commodities exports, their trump card is that any economic model needs raw materials. Brazil and many Latin American states, as well as Russia and most African countries, can always modify their commodity trade patterns in order to serve a new economic order. But that also means a lack of incentives for promoting an innovative economic framework and for taking on local vested interests. In periods of bonanza, they will be able to develop some domestic hubs linked to the global digital economy. Absent competitive readjustments, their prosperity will hinge on the ebb and flow of world commodities prices.

Barring unforeseen developments, the biggest winners of the “Internet of Everything” will probably be the more connected citizens of North America and Europe, and to a lesser degree Japan, which is still reluctant to adopt an open and competitive society. The cradle of the whole digital revolution and its most competitive players are located in a few extremely dynamic territorial clusters in the United States (the most famous one being Silicon Valley). The critical global connections infrastructure (hardware and software) are U.S.-centric, from algorithms and Internet Protocol to server “farms,” space communications, and monitoring satellites. The use of 3-D printers and advanced robotics in production processes are also coming from the United States, as are most of the digital economy’s innovations. The U.S. economy and society are the most open to unsettling, innovative, and ferocious competition, rewarding success handsomely. Moreover, the United States’ global cultural influence and military power guarantee its worldwide influence for decades to come, as well as the security

and openness of the global Internet. The new economic rules of the game will arise from the hubs of connected innovators situated on U.S. soil that can also take advantage of the many specific contributions of smaller research centers or of individual innovations in other parts of the world.

Besides the United States, Europe still has all the right skills to play a decisive role. Powerful digital innovation hubs are already burgeoning in many parts of the Old Continent — such as London, Paris, Munich, Silicon Saxony, Berlin, and Dublin — and European industries are not the last in adopting new production technologies. True, old world firms and governments do not have a presence in the control rooms of digital infrastructures, but their contribution to applications, usages, and Internet innovations are second only to the U.S. clusters, on par with very dynamic Tel Aviv.

The much-hyped “Pacific Century” may turn out to be an illusion. It is more likely that we will see the rise of an “Atlantic Century,” benefiting from a new and powerful way of production and consumption, sourced in the most innovative parts of North America and networked with the most dynamic European and Israeli clusters. The energy of economic integration in the North Atlantic will also be boosted by Africa’s increasing economic growth, and by access to new South Atlantic oil and gas discoveries, as well as the huge reserves of strategic minerals and agriculture commodities in West Africa and South America. In the near future, shortening transport distances will become a crucial asset for the smooth functioning of the great digital conveyor-belt. Despite a tradition of clientelism and entrenched power elites, many South American countries are already quite open and competitive societies, and some innovative interconnected hubs are already developing around the region’s most important industrial centers.

African states, for their part, are still young sovereign nations, most of them plagued by bad governance and with ruling elites that are not well entrenched. Paradoxically, this is good news for the new, young, and growing urban middle-classes of the continent, as it opens more opportunities for newcomers and digital entrepreneurs. Specifically, more stable African and Latin American countries — those geographically closer to the European and North American digital locomotives, like Morocco and Mexico — will greatly benefit from deep interconnection by building their capacity to supply the needs of permanently changing customized productions and consumer markets cheaply and quickly. Both Moroccans and Mexicans have embraced open economies and have already guaranteed their access to the two giant Northern Atlantic consumer markets through comprehensive bilateral trade and cooperation agreements. They are methodically pursuing sound energy policies in order to take advantage of the coming boom of renewable power generation and/or the new

hydrocarbons-producing technologies, and are also trying to adapt as fast as they can to the new manufacturing paradigm. The Moroccan economy, in particular, is already geared to providing information-enhanced services in such sectors as aerospace, finance, new textile-production lines geared to the customized “Fast Fashion” trend, pharmaceuticals, and electronics and information technologies. With its modern Tangier-Med port ideally situated between the Atlantic and the Mediterranean, its growing economic presence in sub-Saharan dynamic markets, its favorable time zone, and its fairly large pool of engineers and technicians, Morocco can rightly aspire to become an important hub between the Mediterranean, South and North Atlantic, and the global economy. Notwithstanding all the obstacles and unforeseen pitfalls, an interconnected, cooperative Atlantic space seems to be taking shape, and it would constitute a powerful magnet for incorporating the most innovative and open East Asian hubs with the Western world.

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4 CONCLUSION

The price paid for keeping this consensual way of organizing economic life alive was the erosion and disintegration of national markets and polities.

Throughout the 20th century, Fordism associated with communication technologies together constituted a powerful force for generating wealth and consumer well-being for a growing number of middle-class citizens. The term “citizens” is used here because the standardization of goods and tastes brought about by the “mass production for mass consumption” paradigm was also one of the main forces driving the consolidation of contemporary sovereign nation-states. However, social constructs inevitably change. This unusually effective, long-running economic model had an inner logic: to keep reproducing itself. To do so, it required constant “aggregate demand” growth to absorb its goods. This could only be achieved either by creating and/or finding new consumers, or by producing more affordable goods for existing consumers.

At some point, though, national markets became saturated and the productivity gains of national assembly lines fell sharply. The only way out was internationalization. From the United States to Europe, then to Japan, the East Asian “tigers,” Latin “pumas,” post-Soviet Eastern Europe, “shining India,” and Chinese “command capitalism,” Fordism morphed into “global Fordism”: global fragmented value chains aiming their mass productions at a growing number of global middle-class buyers, whose desires and fads were and are shaped by global media networks. The assembly line logic became almost universally accepted.

The price paid for keeping this consensual way of organizing economic life alive was the erosion and disintegration of national markets and polities. Unusually wealthy middle-classes — by local standards — began to prosper in “emerging countries,” while their counterparts in the old industrial powers began to unravel, largely due to the globalization of the Fordist assembly line and the fact that it was rapidly reaching its growth limits. The new developing-

world middle-classes remained islands of affluence — sometimes comprising hundreds of millions of *nouveau riche* — in local oceans of poverty. Paradoxically, inequality is on the rise in most countries while global inequality is diminishing, and governments are fast losing control over their national economies, including their capacity to implement social policies. This epochal upheaval made use of new information and communications technologies. In his 2013 book *Who owns the Future?*, Jaron Lanier makes a very convincing case about the devastating effects of the network economy, responsible, in his view, for “destroying the middle-class.” But the reality is that the Internet itself did not accomplish such social deconstruction. The U.S. and European middle-classes are being hollowed out by the same organization that made them prosper in the first place: the mass production for mass consumption assembly line model. Modern information and communications technologies were just the available tools used in an attempt to overstep the failings of Fordism and to invent a new (global) way to keep it alive and running. Where Lanier has a point is that, in the future, power will flow toward those who own and master these new technologies.

Many U.S. and European commentators, economists, and sociologists are still bound by their national lenses. They focus mainly on the consequences for their national societies. However, over the last 30 years, the world economy has been moving ahead at a spectacular pace, even if the old industrialized Western economies have experienced a slowdown. The “end” of the Fordist middle-class does not mean the end of economic growth, or the end of the world. But the bias is understandable. If you are living in Washington, Boston, Paris, or Milan, and life is getting worse, it may be hard to appreciate that people in Shanghai, Mumbai, or São Paulo are doing better.

Moreover, all the hand-wringing about the “Great Stagnation” misses a crucial point: U.S. high-tech clusters, connected to their peers and competitors in Europe and a few other centers around the planet, are reinventing the dynamics of growth and restoring the Western “space” as the engine designing the world economy of the future. This trend is returning to the Atlantic (North and South) its role as the powerhouse of globalization. Commoditization of manufacturing will not need explosive aggregate demand for some decades to come. Consumption and “trade” of bytes and services do not have any foreseeable limits — yet. The future is not bleak, but this might be hard to believe because domestic regional and social inequality are here to stay (along with the tensions they bring), at least during the transition period between the “old” and the “new.”

A rise of confrontational politics and security problems is unavoidable. Anguish about making ends meet, as well as a general distrust of political parties and central governments, will be shared by masses of people. National administrations are being reduced to the category of local managers of a global upheaval. A universe of interconnected ICT devices that no one controls is evolving into an automatic regulator of more and more aspects of human activity. “Governance,” the technocratic administration of constraints, is replacing “government,” which is increasingly focused on simply keeping law and order. National representative democracy is struggling to provide solutions for its populations and no one knows what will come next, as global democracy is still inconceivable, even with high-tech computational power and connectivity.

Now, the demise of the national democratic state does not mean ingress into a chaotic “Middle-Ages” where cruel absolute powers police a violent sea of radical interest groups in permanent war with each other. A number of great metropolises

and their hinterlands, particularly those that can build the combination of assets necessary to become players in the new digital adventure, will thrive under democratic, participative decision-making processes. “Smart” social and economic organization can deliver sustainable and environmentally friendly growth. Exceptional individual freedoms (in places that are vibrant and livable) and an infinite choice of free life styles (made possible by the virtual conveyor-belt) can flourish side by side.

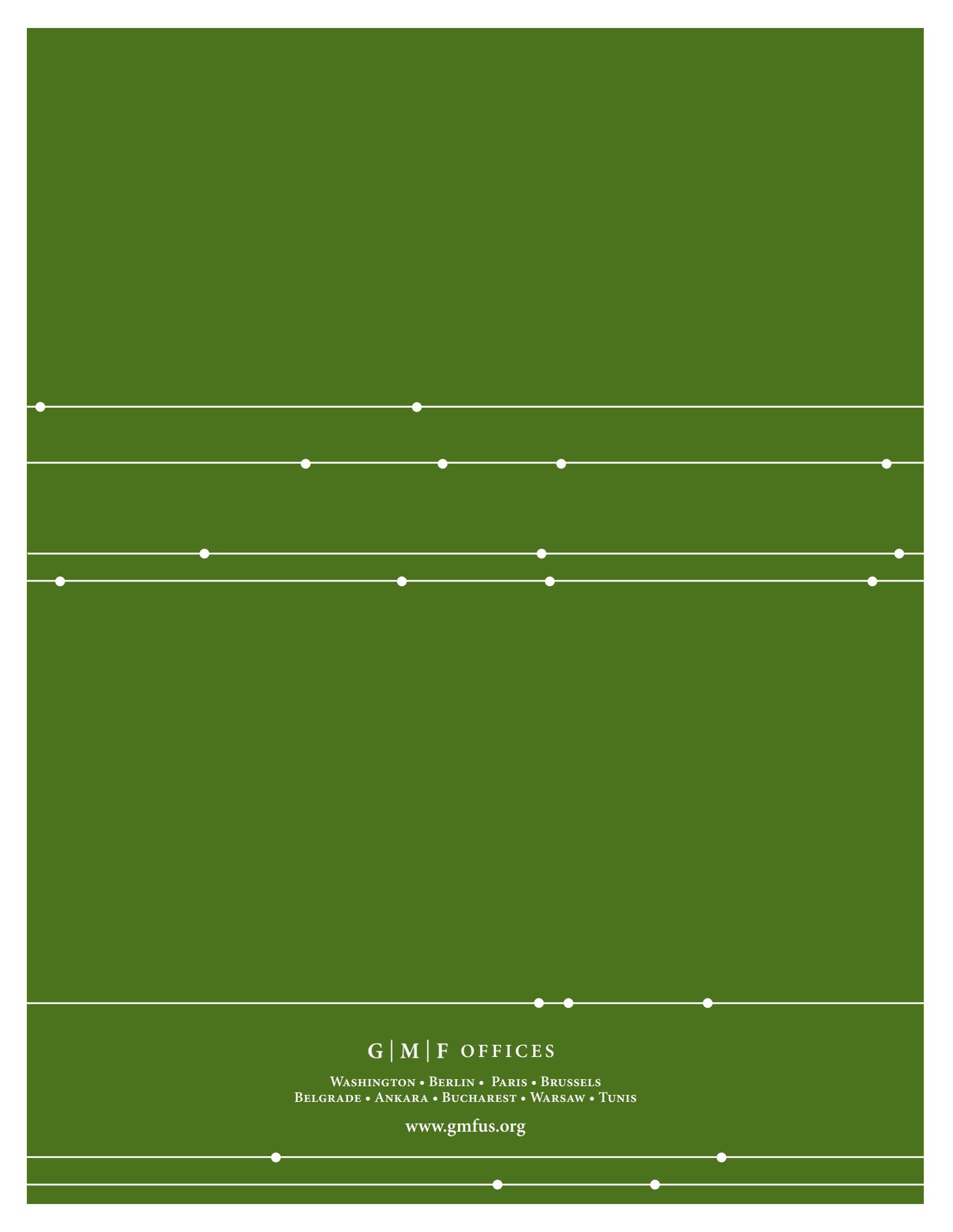
More importantly, these dynamic hubs, where a new economic model is tested by trial-and-error, will themselves be interconnected across national borders, creating a formidable transnational dynamic for ushering in the new digital era. Obviously, in such turbulent times, nothing is easy. As usual, even the well-intentioned will need protection and a guarantor of last resort against risks to their survival. Accommodation with “old” national authorities will still be needed. The whole process is likely to remain tumultuous, as the opposing pulls of powerful centralized control and local, decentralized legitimacy clash.

The digital economy, however, is a post-sovereign economic system sprouting from the ruins of the national polity and of the slowly fading “classic” assembly line. There is no way back, neither to a contemporary Middle Ages nor to the good old days of Henry Ford. This transition period is particularly cruel and will demand bold attitudes and decisions. The “middle” is being drained. Single individuals as well as political institutions are confronted with the same conundrum: either risk disruptive change or settle for stalled and violence-prone mediocrity. A race is on between building a successful new socio-economic paradigm and drifting toward chaotic, dangerously polarized societies.

The future is not bleak, but this might be hard to believe because domestic regional and social inequality are here to stay.

Until the new economy matures into a more inclusive model, the global value-added will likely be captured by a small segment of society. First and foremost, the “Masters of the Algorithms” can be expected to prosper: established mega-firms and people providing the hardware and software infrastructure of the global “Internet of Everything.” In the second position, the “Digital Winners,” those who have the skills and resources to take advantage of the opportunities opened by the virtual conveyor-belt, will also be successful.

Third, the “Also-Ran” big raw materials producers and old assembly-line hubs will enjoy intermittent economic well-being, along with late Fordist spurts in Africa. This last category can shift from contentment to resentment, depending on levels of dependence vis-à-vis the ups and downs of the world economy. Finally, at the bottom of this profit-taking scale lies “Misery,” the destitute masses of the world poor — in both developing and developed countries.

The image features a solid green background with several horizontal white lines. Small white dots are placed at various intervals along these lines, creating a minimalist, grid-like pattern. The lines and dots are distributed across the page, with a higher density in the upper and lower sections.

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