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As Time Went By - Long Waves in the Light of Evolving Evolutionary Economics

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As Time Went By

- Long waves in the light of evolving evolutionary economics

Francisco Louçã¹

Abstract

Evoking Chris Freeman and following from the last book he co-authored, this WP asks why has the Phase B of the fourth long wave been so long, since the major turning point of the 1970s. As Chris's answer was the mismatch between the new techno-economic paradigm, available for decades, and the socio-institutional framework, which is being transformed by the neoliberal agenda, this paper investigates such contradiction. I study the new regime of accumulation, based on the boom and devaluation of fictitious capital, and the four radical conditions that are required to solve the mismatch: liberalization of financial flows, privatization of public goods, precarization of labor, and globalization of markets. The development of such agenda imposes time consuming changes in social relations, namely in the selection, education and networking of the political decision makers, imposition of aggravated inequality and changes in the international hierarchy of powers, which are discussed.

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1. Introduction

As Time Goes By was first published at the turn of the century, almost twenty years ago.² It was the last book (co-)authored by Christopher Freeman, who passed away in August 2010. A great scholar, an innovative researcher on innovation, a passionate academic with broad interests, a good friend, and an impressive teacher, Freeman's contribution to the book summarizes his lifelong achievement: the reconstitution of economics as a practical science of real life, focused on understanding major changes, dynamics, and institutions as well as people, ideas, and motivations. In this and other pieces, Freeman combined historical research on industrial and technological revolutions with a radically novel theory of mutations in the economic process.

Freeman synthesized three theoretical approaches: the Cambridge tradition that considered economies as organic totalities; the Marxist and classical vision of the economy as the expression of social relations; and the Schumpeterian view on capitalism as an adaptive system moved by profits and innovation. For him, evolutionary economics provided the synthesis and expressed his view on living dynamics, as the object of economics are social forces and organizations in complex institutional systems, understood as the articulation of conventions, laws, traditions, cultural traits, and modes of dealing with conflict and class relations. For that understanding, Freeman emphasized the role of endogenous change generated in techno-economic paradigms that organize the system of production and accumulation.

Modern economics should integrate Freeman's insight. Economic cycles and, in particular, an extended period of financial instability and mediocre recovery after a great crash and a long recession demonstrate that equilibrium macroeconomics and rational expectations cannot explain real life economies. *As Time Goes By* offered an alternative: understand history, model the dynamic forces of inertia and change, and elaborate the process of evolution through innovations, shocks and coordination. Resuming that agenda, I will consider here some of the major contributions to evolutionary economics since the book was published, focusing on long waves and economic fluctuations and applying our argument to interpret the current period of stagnation and global financialization.

Our framework posits long historical waves, each divided into a broadly expansionary Phase A followed, as contradictions and countercurrents build, by a broadly contractionary Phase B. My thesis here is that we are living the long Phase B of the fourth long wave (Phase A began in 1940-5 with the transition to Phase B occurring in 1973-5). In the current case, this Phase B has been shaped by structural changes imposed through three processes: the neoliberal reconfiguration of institutions, the financialization of surplus extraction, namely through rentism, and accumulation via intensified inequality. These very changes undermine the conditions of relative stability of the economic and social management prevailing during the previous expansion wave and lead to fragile regimes and to chaotic international relations dominated by the decay of the hegemony of the US. Both economically and socially, it is a dangerous transition.

² Freeman and Louçã, 2001. Since then it has been successively translated into different languages: Chinese, Portuguese, Ukrainian and Turkish.

In the past, the end of each Phase A, or expansion, was marked by a major recession as was the case in 1929-33 and in 1973-5. Historical experience indicates that Phase B ends with different and certainly unpredictable processes: world war or other form of radical devaluation of capital, for example by inflation. The current Phase B has been exceptionally long because it has been dominated by a distinct reorganization of capital through a far-reaching institutional realignment of domestic social relations and of the international hierarchy, while no abrupt, radical and global devaluation of capital has been successful, since the only limited process was that of the cyclical crises, such as that of 2007-8.

The peculiarity of this readjustment is the theme of this paper. I argue that a constellation of innovations forming a new techno-economic paradigm is already available, and has been there for long. Yet the institutional adaptation takes many years to complete as it is a contradictory and conflictive process. It is based on four demanding elements of the neoliberal program: liberalization of financial flows, privatization of public goods, precarization of the workforce, and globalization of markets. This process changes the pattern of accumulation, imposing a new regime, that of financialization, therefore altering the composition and distribution of surplus among the owners of capital. Furthermore, this leads to new forms of economic instability, given the tendency to boom and devaluation of fictitious capital, and given the consequent crises of national and democratic sovereignty. The implication is that new challenges of the international leadership emerge and, forty years after the end of Bretton Woods and the end of the Vietnam War, and thirty years after the collapse of the Soviet Union, an international order is still to be settled – and what exists is becoming more difficult to stabilize.

The introduction summarizes the argument and places it in the framework of evolutionary economics. Section two discusses the long downturn of the post-Second World War long wave, structural changes in the global and national economies, and the evolution of the profit rate in major economies. Section three investigates the institutional and social conditions in order to explain why this long wave has been so long and, finally, some conclusions are presented.

1.1. The contribution of *As Time Goes By*

We opened the book with a review of the history of economic thought on business cycles. In the early days of classical economics, including Adam Smith's research on the wealth of nations, cycles were a main topic for economics. One and a half centuries later, Nikolai Kondratiev, best known thanks to Schumpeter's appreciation, originated an interpretation of "long cycles" (Louçã, 1999a). Yet this was only known at the international level from partial translations of Kondratiev's works.³

³ Most of the papers by Kondratiev were only translated into English shortly before the end of the last century. A French translation of the 1926 debate at the Conjunction Institute at Moscow and some other papers was available, under the supervision of Fontvieille (Kondratiev, 1992), but the Pickering and Chatto edition, under the editorial efforts of Natalia Makasheva, Warren Samuels and Vincent Barnett (Kondratiev, 1998), provided four volumes covering a much more extensive ground: the first two volumes included the contributions on cycles, the third and fourth published Kondratiev's research on agriculture, and the latter included speeches and letters. Although this includes some material written while in prison, he also prepared or at least sketched other writings that are lost. Vincent Barnett (1998) provided the reference biographical essay on Kondratiev, based on unpublished archive material.

Kondratiev fits into a literature offering long-term perspectives on structural change in the economic conditions of value creation and distribution. Previously, Stanley Jevons (1884), John Bates Clark (1899), and Buniatian in 1915; contemporarily and independently, Beveridge in 1921 and 1922 (Korotayev and Tsirel, 2010); and under some influence by Kondratiev, the young mathematical economists who shone in the years of high econometrics such as Ragnar Frisch (1927) and Jan Tinbergen (1929), then Joseph Schumpeter (1939), and then Ernest Mandel (1964), Richard Goodwin (1986), Kaname Akamatsu (Tausch, 2014), and many others, considered business cycles and long waves of capitalist development, or Kondratiev cycles, a term suggested by Schumpeter.⁴ They argued that these changes can be interpreted according to a general pattern of waves of expansion and contraction, deeply rooted in industrial revolutions (the diffusion of steam power, electricity, internal combustion engines, and microelectronics) that transform the way of producing and living and generate specific physical systems, each related to a concrete form of work, management and use of capital.

Nevertheless, research on industrial revolutions and even on the very notion of a business cycle faded as the developed economies entered the period of sustained growth after the Second World War as the neoclassical synthesis dominated economics. Indeed, Paul Samuelson believed that the thirty golden years after the War were the inaugural period of permanent growth, unalterable by perturbations, and the concept of economic cycle retreated into obscurity. Yet Samuelson's prediction proved wrong and the facts of life rejected the optimistic view of a frictionless economy. What was announced as the era of permanent growth proved to be merely Phase A of the fourth Kondratiev. The major recession of the 1970s marked both the beginning of the downturn, Phase B, of the Kondratiev wave and posed a substantial challenge to the Keynesian-neoclassical synthesis. The onset of Phase B proved that the cycles and crises are indeed the pulsation of modern capitalism and set the stage for the rise neoliberalism. With that turn, Kondratiev, Schumpeter and Marx were back, even if Friedman set the policy.

As the expansive long wave which dominated the post-WWII era came to a close, several authors revived classical views of economic cycles, a movement we joined with *As Times Goes By*. Ernest Mandel was the first to associate the dynamics of accumulation with long waves, namely with his 1964 article, his thesis on late capitalism and then with his Marshall Lectures (1964, 1972/1997, 1995). The French regulationists, some mathematically inclined economists working on complexity, such as Richard Goodwin (1986, 1991), and economic historians and statisticians including Angus Maddison (1981, 2008), Giovanni Arrighi (1989), and Jan Reijnders (1990) reconsidered the theme and provided new insights on the phases of development of the contemporary developed economies. Chris

⁴ Makasheva (1993) also presented evidence for some Russian predecessors of the program further developed by Kondratiev, and recently Besomi (2016) investigated some nineteenth century forerunners that were not considered in the previous literature on the subject. That is the case of William Langton and John Mills, Manchester bankers and colleagues of Jevons at the Manchester Statistical Society, of Henry Riverdale Grenfell, a director of the Bank of England and, finally, of Herbert Foxwell, the editor of the collection of Jevons's papers. They all considered in some detail the statistical evidence of price movements, with Grenfell studying the impact of changes in the price of gold, a useful argument for his defense of bimetallism, and Foxwell discussing the effects of prices on employment. This type of approach, based upon long series of prices, was pursued by many different researchers (e.g. Frisch, 1932, considering a long series of prices; or Fischer, 1996, studying price movements since medieval times).

Freeman and Carlota Pérez proposed a theory for the interconnections between the socio-institutional framework and the techno-economic dynamics. The Social Structures of Accumulation (SSA) school proposed “stages of accumulation” combining social, political and institutional factors: in that framework, the decline of the profit rate in the late 1960s resulted from the erosion of geopolitical power, the squeeze on profits imposed by the rise of organized labor, other social and legal constraints on the power of capital, and inter-capitalistic competition.⁵

As Richard Nelson notes in his preface to *As Time Goes By*, long waves may be described as a succession of eras (Hobsbawm 1968), phases (Maddison 1981), or accumulation regimes (the Regulationists and the SSA school) or still as a succession of socio-institutional systems built on a cluster of technologies, an idea that goes back to Marx. The book vindicates these views and identifies common structural causes for the wavelike movement. Chris and I rejected both the view of evolution as a superimposition of random events, as if real history were but a single sample drawn from a large universe of possible realizations of the same process, and the notion of events as exogenous perturbations on a sea of regularities. Instead, following Nelson and Winter (1977) and Dosi (1982), we looked at technological trajectories and the paradigm they form in order to understand the processes of industrial revolution, and we added the dimension of social relations, conflict, and institutional power.⁶

Freeman always emphasized, as we pursued in the book, that industrial or technological revolutions are insufficient to explain long periods of structural change in modern societies. He distinguished between the emergence of the technical potentiality of the new key factor of an industrial revolution, for example, electricity itself, and its diffusion, including the radical and process innovations generating further social, organizational and technological change, for example, the consolidation of Thomas Edison’s great corporation or rural electrification during the New Deal. He focused on the landscape of the industrial and economic sectors concentrating or following the gradient of productivity and profitability, on the impact of the major changes in production and distribution, and on the social relations supporting both. Rejecting technological determinism, Freeman argued that the explanation for the long period of readjustment after a crisis of accumulation is the structural mismatch between the capabilities of the emerging techno-economic paradigm, established from the pool of available epoch-making innovations, and the socio-institutional framework required for a specific form of their deployment.

⁵ Bosserelle (1994) mapped the connections among the Social Structures of Accumulation School, the Freeman-Perez approach and the over-accumulation explanations, considering the evolution of the profit rate. Silverberg (2003), in a more technical tone, surveyed the interpretations but also how the long waves were modeled and measured through the different contemporary contributions. He recapitulated the evidence for the clustering of innovations, from the Schumpeterian hypothesis to the General-Purpose Technologies research program. A comparison between the analysis of cycles and other studies on disequilibria and perturbations was proposed earlier (Louçã, 1997), and applied to the history of the theories of long term fluctuations (Louçã, 2011).

⁶ This is comparable to the notion of a regime defined as a “Social Structure of Accumulation in the set of political and economic institutions that directly impinge on the capital accumulation process – the activity of generating and reinvesting surplus value in capitalist firms – by anchoring expected profitability” (Basu, 2016).

In this paper, my argument is that the current mismatch is an adequate explanation for the prolonged downturn since the crisis of 1973-5 and the social implications of that process.

1.2. Some building blocks of evolutionary theory

A brief survey of evolutionary economics establishes its ability but also its limits to contribute to current debate on the resolution of the long downturn. My argument is that, in spite of advances in econometrics and modeling, we still lack an evolutionary macroeconomics. Its construction is a fundamental task that can establish reasoned economics in the classical sense, or economics as a realistic and historical social science. For this project of evolutionary macroeconomics, the concept of the mismatch between the techno-economic paradigm and the socio-institutional framework is fundamental. Debates on political business cycles and, more recently, on stagnation and inequality, should be considered.

Although its genesis refers to an ensemble of disparate contributions through time, the revival of evolutionary economics is particularly due to the 1982 seminal book by Nelson and Winter, *An Evolutionary Theory of Economic Change*, which provided both the theory and a practical demonstration of a new approach to modeling.⁷ Other building blocks have been Chris Freeman's *The Economics of Industrial Innovation* (Freeman, 1974, new edition by Freeman and Soete, 1997), Bengt Ake Lundvall's *National Systems of Innovation* (Lundvall, 1992), and Stan Metcalfe's *Evolutionary Economics and Creative Destruction* (Metcalfe, 1998), all published before *As Time Goes By*. More recently Carlota Perez's *Technological Revolutions and Financial Capital* (Perez, 2002), Kurt Dopfer's *The Evolutionary Foundation of Economics* (Dopfer, 2005), and Alan Kirman's *Complex Economics* (Kirman, 2010) provide theories, research methods, empirical approaches, dynamic models and the historical view required by the evolutionary theory.⁸ They establish an agenda for industrial and innovation studies, for management and organizational surveys, for disequilibria and coordination theories, and for the discussion of economic and social conflict and change.

Giovanni Dosi was pivotal to this research and, in some cases, inaugurated new avenues, in particular as he extended the evolutionary dynamics to the articulation of an empirical approach and a generation of agent-based models embodying the intuitions of Smith, Marx, Keynes, and Schumpeter. A recent book (Dosi, 2012) recapitulated this work on economic organization and industrial dynamics. As he notes, neoclassical economics distinguishes between dynamics and coordination, following the combined assumptions of stable preferences, maximizing behavior, and equilibrium, with optimal decisions from well-defined choices. The emergence of coordination problems appears ontologically impossible in neoclassical economics: "Why would a representative agent able to solve sophisticated intertemporal optimization problems from here to infinity display frictions and distortions in the short run?" (ibid, xvi). As a consequence,

⁷ Nelson provided a dozen years after that seminal book a survey of the "recent evolutionary theorizing in the *Journal of Economic Literature* (Nelson, 1995), which completes the short notice presented in this essay.

⁸ See for instance Malerba (ed., 2004) and Drechsler et al (eds., 2009).

coordination, solvable by construction, is assumed, for instance, by DSGE models, and endogenous cycles tend to be excluded.

Instead, evolutionary economics looks at non-equilibrium processes. Bounded rationality prevails in its framework, being established both with psychologically realistic models of individual behavior, *a la* Kahneman or *a la* Thaler, and with socially adequate descriptions of collective interaction. In this case, heterogeneous agents learn and adapt both within and outside markets, which suggests a larger institutionally embedded evolutionary process not reducible to markets, as in Marx, Veblen or Coase. Endogenous preferences and endogenous innovations, knowledge-based and capability-based firms and national systems of innovation, and coordination as one possible outcome of a social process of decision making and conflict impart a structure far different from the optimization and rational expectations framework pushed by the mainstream in the 1970s. Complex evolving systems demonstrate co-evolutionary dynamics and emergent properties, such as fat tails, non-ergodicity, and path dependence or hysteresis (David, 2005). Evolutionary economics is therefore concerned with the drivers, patterns of change and mechanisms of coordination, and uses stylized facts from empirical observation, exploring regularities and structures, an approach that replaces axioms by factually based conjectures.

The approach has been successful, providing interesting contributions to empirical research on patterns of change at the firm, industry and national and international levels, suggesting alternatives for decision making, and building a corpus of insightful models. Yet, evolutionary economics still suffers from two limitations, preventing it to emerge as a coherent alternative to the neoclassical syntheses. First, Dosi observes that evolutionary economics requires but lacks a theory of value, interpreting the social classes and different relations and strategies, such as rent-seeking, exploitation and, broadly, power (ibid: xlvi). Second, an evolutionary macroeconomics proposing a realistic vision of the historical process, including economic cycles and long waves, phases of hegemony and other social, political and economic forms of determination, has yet to emerge. *As Time Goes By* contributed to the second and incidentally to the first.

1.3. A summary of the argument

That the 1973-5 crisis represented the turning point of the post-Second War long expansionary wave is widely accepted. After the profit rate in major economies peaked at its historical maximum at the end of the 1960s, the erosion of the conditions for sustained productivity gains and accumulation, and the monetary turmoil with the end of the Bretton Woods system led to a structural crisis. Furthermore, the US defeat in Vietnam, the impact of the youth insurgency from San Francisco to Mexico City, Paris, and Prague, and other forms of social activism, constrained the capacity of reorganization of the center of the international power system. In the following decades, the US model, based on technological dominance, domestic over-consumption, and military and political supremacy, eroded.

The second argument in this paper is that, like all previous downturns, the period since the recession of 1973-5 has been marked by the availability of a new constellation of technological and economic innovations, or a new paradigm:

computerization, automation, genomic science and new processes of flexible production have been developed for years. The key inputs (microelectronics and microbiology), the carrier branches (computers and software industries and pharmaceuticals), the new transport infrastructure (based on telecoms and internet) and organizational innovations and cultural changes (such as the flexible forms of work organization, the rise of individualism, and expansion of the prerogatives of intellectual property) and new favorable location for the production process with high surplus (Asia), were available since the 1980s and, if fully developed, could favor a new phase of accumulation on the basis of intense surplus gains. Yet this transition is the longest phase B on record. Decades have passed without full redefinition of the socio-institutional system, and the structural mismatch slowed down the diffusion of this techno-economic power, as expressed by social and cultural resistance, but also given the long delay of different factors to be developed.

The third argument is that this mismatch has been the battleground between adaptive and counter-adaptive forces. With a colleague, I recently discussed how monetarism and neoliberalism have been imposed in this period using deep institutional transformations: the withdrawal of the central banks from public oversight, deregulation of capital flows, austerity budgets, and removal of labor-market protections. Using case studies from the US, Europe, Latin America and Asia, we investigated the conformation of social forces and intellectual movements that shaped policy and politics, selected the personnel, trained the bureaucrats, and reproduced the ideas (Louçã and Ash, 2018). I draw on those findings here.

A key constituent of the reconfiguration has been financialization. After the turn of the century, low interest rates favored an expansion of credit that sustained demand, maintaining the consumption of working people (albeit with higher debt substituting for the rising wages of the previous generation). The intensive financialization of the world, including expropriation through debt, revealed the tensions of this mode of development. Indeed, globalization, a recurrent phenomenon, is not the specific characteristic of this epoch; the expansion of international trade, migrations of people, and flows of foreign capital were present in previous periods of economic change. Instead, it is the dominance of financial deregulation and free circulation of capital that define the era.

The consequence of this specificity is that, if liberalization already in the 1980s stimulated a partial recovery of the rate of profit, and in the 1990s the entrance of China and the ex-USSR in the world market and low interest rates provided an additional boost, even these large scale events were insufficient and transient. Then came the 2007-8 subprime crash, igniting the first recession since World War II to reduce global output, and the sovereign debt crisis in Europe followed in 2011.

Finance has played a crucial role for the reproduction of the neoliberal model for the last three decades. Indeed, the role of finance is to facilitate and to widen the transfer of value and capital and to impose coherence on the model. But the rapid expansion of “fictitious capital”, a term used by Marx and others to indicate those financial titles that establish rights of access to uncertain future distribution of surplus, creates large vulnerabilities. A financial crisis occurs when the claims of fictitious capital are abruptly devalued, a likely occurrence because the size of the claims is largely decoupled from the surplus actually generated in the

economy. As a consequence, each crash and its fallout reveal systemic crises of the neoliberal order.

The fourth argument is that this long transition, including the degradation of international leadership and the emergence of a challenger, plus the internal modification of the processes of accumulation as set by financialization, create a peculiar selection of forms of power, in some cases rapidly replacing the political parties and regimes that were established in the aftermath of the Second War. The dominance of global economic powers, aggravating the disconnection between sovereignty and democracy, favors populist and authoritarian regimes.

Unlike the three previous long wave downturns, formal democracy survived in the dominant economies in the 1970s. Wars were promoted, but abroad, fought by proxies and limited to confined spaces. Democracy in Europe even expanded at the time of the turn of the fourth long wave, with the fall of the dictatorships in Portugal, Spain and Greece. This process extended to Latin America with the process of demilitarization of Brazil, Argentina, Chile, Paraguay and Nicaragua, and to Africa with the final wave of independence of the Portuguese colonies and the end of apartheid in South Africa. As a consequence, popular claims for the rights of workers and common people, for some degree of formal democracy, and for the extension of welfare were amplified through the initial years of the new period. But the elites simultaneously embarked on a long-term counter-offensive through debt and exchange crises, strict monetary policies, and austerity. The socio-institutional system has been shaped by these conflicts. This tension led to uncertainty and, as accumulation drives capitalism, to further political and social crises.

I contend that the framework of Kondratiev waves provides an apt explanation for the current epoch-making downturn and for the ferocious attempt to rearrange the social structures. As a consequence, a new mode of social organization is being drawn, aiming at the expansion of profitability and accumulation, on the basis of complex tasks being delivered by cheap labor. The role of the IMF, the ECB and other central banks, the European Commission and Council and other participants in imposing austerity across Europe and beyond highlights the drama of the current situation. After a brief flirtation with liberalization and traditional forms of democracy, the cracked-up remnants of the Eastern European state-authoritarian model settled rapidly into a capitalistic oligarchy. East Asia, beginning with Japan and then including Taiwan, South Korea, and now China and Vietnam, has continued rapid yet unequal growth – growth that was initiated and cultivated by strongly *dirigiste* policies but which are now being supplanted or complemented by extraordinary concentration of wealth.

This is an instance of a global case: across the world, increased inequality is the rule of modern economies. As we pointed out in the book, the reconfiguration of political regimes marks the adjustment to each structural crisis. But a new level of contradictions inside social regimes based on increased inequality is expressed by the election of Trump, diverse government crises as in South Africa, Mozambique, Angola and Congo, the ascendance of reactionary rulers in Italy, Hungary, Poland, Slovakia, Czech Republic and Austria, militarist governments in Egypt, Philippines, and Syria, coups in Paraguay and Brazil, internal collapse and international pressure in Venezuela, electoral fraud in Honduras, repression in Turkey and ethnic cleansing in Myanmar, Israel, and Iraq. Instability and the democratic void lead to further dangers of social repression and degradation of democratic rights.

The emerging social structure will confront the additional challenge of an environmental and energy crisis centered on fossil-fuel dependence in the economy and the prospect, in the shorter or longer run, of decarbonization. Furthermore, the global demographic structure continues to age, with declining and delayed childbearing resulting in older and smaller populations. The demographic transition is accompanied by significant reduction in the willingness of women to continue to provide free and thankless care imposed by gender inequality, among other forms of discrimination.

In the next pages, I discuss why this transition has been so slow and speculate on what may follow. Following Freeman, I will argue that the explanation for the prolonged downturn phase can be found in its social and institutional evolution, and begin by summarizing our description of the involved processes, to consider what is happening nowadays.

1.4. A typology of the techno-economic paradigm and the socio-institutional system

Each of the long waves can be described according to four main dimensions: technological paradigm, accumulation regime, socio-institutional regulation and international hierarchy.

1) The *technological or techno-economic paradigm* describes the relations between the mode of production and available techniques. In each period, a constellation of innovations is available to be diffused in the economy, following a key factor and a dominant branch, such as the automobile in the past or information and communications nowadays. But technical innovation alone does not create a new society. The process of accumulation may be blocked by the mismatch between the techno-economic paradigm and the social regulation framework.

2) The *accumulation regime* describes how production and realization are combined. From the point of view of production, accumulation depends on productivity and surplus. From the point of view of realization, unequal distribution of wealth may inhibit demand. The accumulation regime also refers to the rules of the game, the “productive order” (as put by Dockès and Rosier) and concerns the structure of the ruling class itself, including relations among industrial and banking capital, firms, shareholders, and managers.

3) *Socio-institutional regulation* involves the laws and practices that organize work and social reproduction and determine wages, broadened to include social security, public services, and other forms of indirect or social wage. The structure of work is a major component of the social order and source of legitimacy, but during periods of contraction social regulation tends to be out of phase with the requirements of capital accumulation, which asks for major transformations in the production and distribution of surplus.

4) Finally, the *international hierarchy* corresponds to the organization of the world economy and defines the insertion of each social formation in the global market. One dimension is the global division of labor, namely who extracts raw materials,

who produces industrial goods and more sophisticated services, who dominates the channels of trade, including the communication and the information technologies. But the international hierarchy also involves the definition of global reserve currencies, the control of investment and international financial flows, and of essential goods, such as water. Financial, military and political relationships define the hierarchy of power.

Changes in the regulatory regime at the national or international level can generate political and ideological conflicts within and between nations. In Britain, conflict over the Corn Laws in the 1830s and 1840s and over Tariff Reform in Britain in the late nineteenth and early twentieth centuries had profound effects on the catch-up countries, United States, Germany and Japan. Conflict over trade issues can implicate fundamentals of national interest and yield broader friction in international relations, as illustrated in the Anglo-German naval armaments race before 1914, later in the emergence of German neo-mercantilist policy within the European Union, and eventually in Trump’s crusade to redefine the US trade balance.

Table 1 summarizes this view of the contemporary transformations according to these four criteria, as applied to the dominant economies in two epochs.

**Table 1:
The Fourth Long Wave: Fordism and neoliberalism**

	Fordist Capitalism Upswing of the long wave (Phase A) c.1945-1975	Neoliberal Capitalism Downswing of the long wave (Phase B) 1975-present
Techno-economic paradigm	Fordism	Computerization
Accumulation regime	Corporate and managerial capitalism	Financialization
Socio-institutional regulation	Social contract	Flexibility
Organization of the international hierarchy	Internationalization	Globalization

In the following, each of these dimensions will be discussed. In the second and next section, the evolution of the techno-economic paradigm and the accumulation regime will be sketched. In the third section, I concentrate on the explanation for the length of Phase B, or the mismatch between the techno-economic potentialities and the social and institutional obstacles to a new dominant accumulation regime.

We close *As Time Goes By* with the case for non-determinism. No fate imposes each peculiar form of this process of change. Although clear-eyed about the menaces our societies face, Chris Freeman was an optimist and struggled ceaselessly for the socialization of the benefits of new technologies, in order to democratize information and to enable broad access to common goods. He thought, rightly, that the contemporary information revolution presents an opportunity for full employment and a better life, and he opposed anti-democratic regression. Neoliberalism and the populist authoritarian turn manifest the current structural crisis but represent only one strand among many. In any case, the dice

are not all cast. Forty years of mismatch and of drastic changes in the international hierarchy were not enough to completely redefine social relations. The question remains: where will this transition based on slow recovery and recurrent financial crises lead? Will it aggravate inequality, conflict, and international disorder? Or can it be challenged and changed?

2. Accumulation and profit in the long downturn

This section investigates the evolution of the accumulation process during the Phase B of the fourth long wave. There is broad consensus that the general crisis of 1973-5 marked the turning point from Phase A to Phase B of the long wave but less so about the progression of Phase B. First I present facts and data and then analyze the evolution of profit and accumulation.

2.1 The turning point: the general recession of the 1970s

The 1973-4 recession was ignited by successive failures, from the collapse of the monetary system established in 1946 at Bretton Woods and inflationary pressure from the OPEC price hikes, to the political turmoil created by the resignation of Nixon and the US defeat in Vietnam. Different, if not mutually exclusive, interpretations on the nature of the tensions leading to the crisis include: monopoly dynamics leading to overcapacity and under-consumption (Sweezy and the *Monthly Review* approach); finance and debt creating bubbles (the Bellamy Foster and Magdoff variant of Sweezy); rising wages and working-class resistance squeezing profits (Glyn and Sutcliffe; Boddy and Crotty); over-investment and declining labor productivity, reinforced by competition and asset-price bubbles inducing overcapacity (Bowles; Kotz); intensification of competition with persistent overcapacity (Brenner); increasing capital intensity and labor-saving technical change, increasing the “materialized composition of capital” and inducing a crisis of profitability (Shaikh); the exhaustion of the post-WWII technical innovations (Duménil and Lévy); a crisis of financial hegemony and growth of the ratio of unproductive to productive labor (Moseley); the secular decline of the rate of profit (Kliman); and a declining capital-output ratio and overcapacity in global manufacturing pushing down the profit rate and return on capital, with stagnating wages creating a deficit of aggregate demand (Basu).

Ernest Mandel hypothesized that long-term expansion was propelled by radical innovations enabled by rising profitability, which reduced the organic composition and price of fixed capital, while elevating the surplus rate. The expansion was systemically enabled by accelerated circulation of capital under a stable monetary and financial system and expanding markets (Mandel, 1972). In the long downturn declining productivity growth after the end of the 1960s reduced the rate of profit and led to the recession of the mid-1970s. The devaluation of capital during the stagflation of the 1970s constituted an adjustment of sorts. This dynamic corresponds broadly, even if the formalism differs, to the Freeman-Perez approach.

Duménil and Lévy (2002) explain the evolution of the profit rate by the decline of measured productivity of capital, with a decrease in the price of output relative

to fixed capital. Profit share declined slightly and, until 1980, labor productivity decelerated relative to real wages.

2.2. From the 1980s to the turn of the century: was there a recovery?

Tracking the profit rate in UK, Italy, France and Germany, Angelo Reati (1990) confirms the standard dating of the fourth long wave: expansion from the mid 1940s to the end of the 1960s, a major recession in the mid-1970s but then, from 1982 on, “a durable recovery” (Reati, 1990: 6-8; also Scandella, 1998). Other authors concur: in spite of slow accumulation, from 1980 to 1989 there was a “modest restoration” in the evolution of the profit rate, and capital-intensive technologies were generalized (Shaikh and Tonak, 1994: 214; Duménil and Lévy, 1993: 250). Others identify a longer recovery (Basu and Vasudevan, 2013), peaking in 1997 (Roberts, 2011: 4-5) or in 2009 (Carchedi, 2011; Alcalde, 2017). In any case, the decline of the profit rate for 1965-1982 was only weakly offset by an upward trend in the period 1982-2000. In the early 1980s, the profit rate in the US was about half of the average of 1956-1965 (Duménil and Lévy, 1999).

A combination of factors restored the profit rate, including lower wages, or an increase of the rate of exploitation, with high unemployment and the globalization of production weakening labor’s bargaining position plus easy credit and cheaper imports softening the social impact of lower wages on consumption. Shaikh refers to 1982-2007 as a new boom: low interest rates raised the net return on capital and allowed consumer debt to maintain workers’ standard of living despite decreasing wages. Low interest rates also launched significant financial and real estate bubbles (Shaikh, 2011: 45). Yet the modest recovery of the profit rate did not achieved that of the 1970s, nor was the profit recovery uniform, with a decline the 1990s followed by an increase from 2001 to 2006 (Norfield, 2012: 115).

Brenner (2002: 3, 7, 265) proposed a different chronology, detecting a “long downturn” and “persistent stagnation” between the turning point of 1973 and 1993 in the US economy. He identifies a “period of prosperity” beginning in 1993, at least for the manufacturing sector, and observes that the US performance during the second half of the 1990s was better than in any period since 1970s (ibid: 2, 49). The engines of growth were mainly two: manufacturing and stock market wealth. But the uptick did not extend to all developed economies, with some lagging significantly (ibid.: 278, 266).

Kliman (2010: 10) points to another factor for the change of profits: “Before-tax rates of profit of US corporations did not trend upward since the early 1980s because of an increase in the rate of exploitation, but because of a long-term decline in interest rates, and a thus a long-term decline in the interest expenses of these corporations as a share of the property income they generated.” He shows that the before-tax profit of US corporations increased as a percentage of the cost of fixed assets, in the 2000s – until the crash.

Roberts (2016: 247, 153, 221) cites an increase in the rate of surplus and little change in organic composition to demonstrate a rise in the profit rate from 1975 to 2008 for the world and from the 1980s to 2007 for the US economy. Li et al. (2007: 39) notes a rise in the US and UK profit rate since 1983, but not in the Eurozone. Li and his co-authors interpret the rise as the opening of a new, fifth long wave, following those of competitive capitalism, corporate capitalism,

regulated capitalism, and transnational capitalism (ibid: 41, 44), as does Ayres (2006). Indeed, each period of tenuous recovery after the generalized recession of the mid 1970s, raised the question of whether Phase B were coming to an end. Duménil and Lévy (2002: 1) seemed to share that view at some point: “The fall of the profit rate was a crucial factor of the structural crisis of the 1970s, and its recent recovery (in the last years of the century) may signal the emergence of a new phase in the history of capitalism in the 20th century.”

As Time Goes By dissented: the emerging Techno-Economic Paradigm – computerization, information, and communication – had expanded and diffused to dominance, but Freeman, unlike other neo-Schumpeterians, argued that, more than a cluster of innovations, a new mode of development is required to precipitate a new wave of economic growth. The new paradigm is a necessary but not sufficient condition to reverse the trend in profit and accumulation. The crucial factor for success is always constructing the match between the techno-economic paradigm and the socio-institutional system guaranteeing its operation. The conditions for a new process of accumulation, leading to a new long wave, have not yet been met.

2.3. The subprime crash

If some controversy remains on the dating and measurement of the short recovery in the 1980s and 1990s, the fact is that the subprime crash in 2008 provoked a major recession marked by financial havoc. The severity of the impact of this crisis on the financial system is certainly a consequence of its fragilities and interlinkages, but it also reveals the systemic tensions amplified by the long transition.

In five months, from March to September 2008, eight of the largest financial institutions in the US collapsed: venerable trading houses, Bear Stearns and Lehman Brothers, the newly diversified entrant AIG, scrappy upstarts, IndyMac, Washington Mutual, and Wachovia, and quasi-public entities Fannie Mae, and Freddie Mac. Six of the crashes came in September. In the collapse, Bear Stearns was rescued and sold to JP Morgan Chase, Lehman Brothers went bankrupt, and Merrill Lynch was delivered to the Bank of America. Washington Mutual's bankruptcy became the largest ever. It was resolved by the Federal Deposit Insurance Corporation, the US agency responsible for guaranteeing the protection of deposits, and most of WaMu's assets were sold to Morgan Chase. Wachovia, the fourth largest bank in the US, was acquired by Wells Fargo, the sixth largest. Investment banks Goldman Sachs and Morgan Stanley were redefined as “bank holding companies” to qualify for public money. Citigroup and Bank of America were bailed out by the public authorities, as did General Motors and Chrysler. Some \$16 trillion were destroyed in the process.

The 2008 bankruptcy of Lehman Brothers, with its debts of US \$613 billion, was until then the largest in US history. Leverage was central in this and in the collapse of Bear Stearns: in both cases, immense leverage (30:1 and 33:1) became a virtual guarantee of the end. Under such conditions, a mere 3% drop in market value would wipe out all of the capital of each firm and force them to realize their losses.

In 2007 the US experienced a bank run to the doors of Countrywide, one of the largest home mortgage lenders; Great Britain witnessed its first bank run in a century and a half, at Northern Rock, and UK taxpayers spent two billion pounds to cushion the banks. Spain had its run on Bankia, overextended both in real estate and in complex financial products, in 2012; Portugal a run on Banif, a small bank, at the end of 2015; and Russia had a run on the Otkritie Bank, the fourth in the country, in 2017, leading to the largest rescue in the history of the country.

In the UK, the government nationalized the Bradford and Bingley bank in 2008 (and then sold it to Santander). In October of that same year, the Royal Bank of Scotland (RBS), Lloyds, and the Halifax Bank of Scotland (HBOS) received a public injection amounting to the equivalent of US\$64 billion, leading to an effective nationalization. The process of bankruptcies and concentrations continued, as Lloyds bought HBOS in January 2009.

In continental Europe, October 2008 also saw the nationalization of the Fortis Bank, through an injection of 16 billion euros from the combined efforts of the Belgian and Dutch governments; its Belgian operation was then sold to BNP Paribas and its Dutch operation to ABN Amaro. Dexia, a Franco-Belgian bank, received 6 billion at the same time; after the bailout, the remaining Belgian operation was transformed into another bank, Belfius. In Europe and in particular in Ireland, Greece, Portugal, Spain, Italy and Cyprus, the ensuing debt crisis unleashed a new wave of bank restructurings and bailouts. These were the cases of Dexia in Belgium and France (2012); Bankia (2012) and then Banco Popular (2017) in Spain; NKBM in Slovenia (2012); SNS Reaal in Holland (2013); Laiki and Bank of Cyprus in Cyprus (2013); Espirito Santo (2014) and Banif (2015) in Portugal; Banca delle Marche, Banca Popolare dell'Etruria e del Lazio, and Carife in Italy (2014-5); Hypo Alpe Adria in Austria (2014-5), among others. Then came the 2017 Italian restructuring of banks: Monte dei Paschi di Siena was bailed out for 6,6 billion leading to its effective nationalization and then, at the end of the year, the colossal sum of 17 billion euros was spent for Banca Popolare di Vicenza and Veneto Banca.

Global contagion had happened before with the 1998 Russian crash, as six of the top ten lenders in the subprime mortgage market in the US had gone bankrupt, including ContiMortgage, Amresco and First Plus, but never to the extent of the 2008 crash and the following recession. This combination of financial devaluation and debt growth precipitated a long recession that, for some developed economies, was the deepest since the Second World War.

Before discussing if this is another proof of the declining macroeconomic conditions through the long Phase B, or instead if it marks its end, I will turn to the evidence on the rate of profit and accumulation, first presenting the argument against determinism.

2.4. Technological determinism

In its analysis of long waves, the Freeman approach avoids a recurring problem of over-simplification in as any models of the long-term economic processes: technological determinism. In our view, clusters of radical innovations or new systems of production are not sufficient to launch a long wave of development. Instead of a detailed and global inspection of the historical data on the economy

and society, technological determinism focuses on processes and products and tends to assume the future economic success of scientific discoveries from their mere availability. The economy is represented as a deterministic path and a sketch of each new techno-economic paradigm is adopted as a map of the future waves: after computation and communication, biotech, genetic medicine and pharmaceuticals are indicated as future drivers of new phases of growth.

Some studies base the periodization of waves on technological trajectories (Edmonson, 2012; Linstone and Devezas, 2012). For instance, Li et al. (2007) identify a fifth wave beginning in 1983, reaching a peak by either 1997 (on the basis of profit rate) or 2004 (on the basis of accumulation) followed by a downswing. Korotayev and Tsirel (2010) use a similar dating for that downswing but locate the subprime crash as the turning point. Grinin and Korotayev (2014) investigate the business cycles (the Juglar cycles) in the long wave, detecting a cycle from 1990-3 to 2001-2, and from then to 2008-10. On the very eve of the crisis Papenhausen (2008) designated the same crisis as a “temporary depression” between two peaks of an upswing with the maximum to be reached in 2018-2020 ten years after the prediction. A more radical version of technological determinism appears in the prediction of a fifth or even sixth long wave, to be based on neuro-technology and to last eventually until 2060 (Lynch, 2004; Dator, 2006; Grinin and Grinin, 2016), and some researchers present a method to predict these future waves (Nefiodow and Nefiodow, 2014).

Instead, for Freeman the emergence of a techno-economic paradigm cannot alone generate a new mode of development. The economy is a social system, and its growth requires a matching socio-institutional coherence. Long waves emerge from indeterminate social processes, and no calendar can predict them.

2.5. The Loch Ness debate

How indeterminate? Well, some researchers argue that, if only historical argument for dating is presented, it is because no statistical evidence is available to prove the calendar – and therefore is proof of failure of this explanation. In this part of the essay I survey the mixed econometric evidence in the search for Kondratiev waves. To echo an old *dictum*, there is no measurement without theory. As our book argued, the long waves are distinct from the historical phases of Maddison (1981) or Solomou (1990) and from periods of rise and decline of world hegemony (Arrighi, 1989). Long waves may include those characteristics, such as the specificity of each historical period or the particular forms of world conflict, but they summarize recurrent social dynamics with common causes (Mandel, 1985; Reati, 1990: 12). The two key variables to track are the profit rate and accumulation.

The debates on the definition and statistical evidence on the evolution of the profit rate will be presented to discuss the turning point in the 1970s (the end of Phase A) and the long Phase B through the subprime crash, the consequent recession, and the current conjuncture in the world economy.

2.5.1. The statistical conundrum

A tale, a curiosity, a coincidence? A reality obscured from the spectator or some deeper secret? Ongoing debate and technical difficulty in detecting the waves has led some researchers to dismiss Kondratiev waves as the Loch Ness Monster (Diebolt and Escudier, 2002). It may exist, but you can never find it. This section presents recent statistical evidence.

Early analysis of price and production series used decomposition methods to resolve trend, cycle, and shock. Decomposition remains the method suggested by real business cycle theory, but it depends on *ad hoc* assumptions to establish the period for moving averages and other computational assumptions and techniques regarding trend deviation. At a deeper level, the notion that fiscal, monetary, or technological exogenous shocks randomly disturb an otherwise stable and stabilizing mechanism owes more to ideology than to science. The distinction between trend and difference stationarity (Nelson and Plosser, 1983) is driven by axiom rather than tested facts.

Alternatively, descriptive methods have been used by several researchers. The new contributions since my detailed survey (Louçã, 1997) do not change the basic findings. Most concentrated on time series of prices (e.g. Jerrett and Cuddington, 2008, found long waves in long series of prices of metal, and Erten and Ocampo, 2013, found super-cycles in commodity prices). Using the same methods, Kleinknecht (1987) and Atkinson (2004) discussed measures of the systemic impacts of innovation. Korotayev et al. (2011) identified long waves in the the evolution of global – but not US – patents activity and suggest a fifth long wave beginning in the second half of the 1980s. Yet, the outcome variables were chosen based on data availability rather than causal importance. They are not the most relevant nor revealing variables. Prices are neither production nor profit, and patents do not reveal markets.

Furthermore, concerns about the validity of decomposition methods led to improvements and alternatives including log-linear trends, the filter-design approach, correlation analysis, structural time series, best fitting polynomial regression, fractional integrated long memory processes, outlier identification and tests for trend break within stochastic models. For instance, using polynomial regression methods, Tausch and his co-author found long waves in world industrial production series (Jourdon and Tausch, 2009: 167-90); Li et al. (2007) measured the profit rate and accumulation for the US, UK, Japan and Eurozone, using a weighted average of the profit rate, and detected four long waves, measured from trough to trough.

A shared problem with these techniques is their minimal theoretical justification, and periodogram or spectral analysis came to dominate as a data-driven alternative free from conceptual biases. Spectral analysis facilitated detection of periodicities in time series for macro-variables, although it requires stationarity (a detrended series) and regularity assumptions (e.g., no structural change in the data), a significant drawback when structural change is the object of study. Spectral analysis has been frequently applied but has led no consensus on the conclusions. Applying spectral analysis to prices, Diebolt and Doliger (2007) and Diebolt (2014) detect only Kuznets cycles and no Kondratievs, and Solomou (1990) provided used spectral analysis also to reject the Kondratiev hypothesis. But other researchers reached opposite conclusions (Korotayev and Tsirel, 2010;

Bosserelle, 2012), and Ozouni found “obvious” long waves, with Kondratiev cycles explaining half of the total variance of GDP after the elimination of a linear trend (Ozouni et al., 2015: 17).

The vulnerability of spectral methods to *ad hoc* assumptions encouraged some researchers to adopt wavelet analysis, which can incorporate irregular, non-stationary, and complex signals, including non-homogeneity through time. Applying this approach to US, UK and France wholesale prices for 1791-2012, Gallegati and his co-authors found strong evidence of long waves before World War II and some indication of linked movements afterwards, but for the last period the signals from prices and GDP diverged (Gallegati et al, 2017: 129; also, Bernard et al, 2014). Comparing their wavelet analysis to those obtained with the Christiano-Fitzgerald band-pass filter, the authors claim robust results. Jacks (2013) applied the technique to price series and reached similar conclusions, while Metz (2006, 2011) obtained opposite result.

Gerald Silverberg (2003), who reviewed the controversies on how to measure and model long waves, discussed these “theory-free econometrics” and, although taking a skeptical view, suggested returning to Schumpeter’s hypothesis, following the inspection of clusters of innovations, of conducting sectors and creative destruction leading to waves of infrastructure investment, like the Kondratiev waves or General-Purpose Technologies diffusion. In that sense, the essential reason for the *lochnessism* of the long waves clearly emerges: concrete historical processes, under the label of an epoch, a phase of development, or a long wave, do not repeat and therefore cannot be measured by a statistical test conceived to detect the orderliness of cycles. Furthermore, the asymmetry of the upturns and the downturns (Coccia, 2010), the implications of social and political variables and internationalization of economic relations, all establish the Kondratiev waves as historically specific, although having recurring causes. For this reason, a statistical tool tuned on regularity is unable to detect the patterns of structural change represented by these periods.

Empirically oriented and using data for twenty advanced countries since 1848 and the turning points detected by Mandel (1995), Basu checked the growth rate of real per capita GDP and capacity utilization in upswings and downswings and, following the Social Structures of Accumulation argument (Bowles et al., 1986), finds evidence of the business cycles in Phases A being “reproductive” (endogenously restoring profitability expectations) whereas they are “non-reproductive” in the Phases B (Basu, 2016).

Robert Brenner (2002) suggested the impact of destructive inter-national trade conflicts as an explanation for global turbulence, and attributed the decline of the profit rate to over-accumulation through competition and globalization followed by a fall in the rate of investment, aggregate demand, and productivity growth. The failure of the manufacturing sector, the epicenter of competition with high sunk costs, to replace less productive capital and to sustain technical change with new investment further lowers the profit rate. Brenner’s extension echoes Adam Smith and rejects the Marxian explanation of the declining the profit rate via rising organic composition (this is discussed by Duménil et al, 2001, and Stockhammer, 2013).

Marx had proposed in volume III of *Capital* the reverse explanation: the declining rate of profit causes intense competition, trade wars and devaluation of capital. In the same sense, Anwar Shaikh, in his massive book on capitalism,

interrogated not the specific cycles but the nature of the pattern itself: “How can the capitalist system, whose institutions, regulations, and political structures have changed so significantly over the course of its evolution, nonetheless exhibit recurrent economic patterns? The answer lies in the fact that these particular patterns are rooted in the profit motive which remains the central regulator of the system throughout its evolution” (Shaikh, 2016a: 726). Following Shaikh, I will use the rate of profit as the sufficient statistic to represent the social and economic dynamics under capitalism.

2.5.2. Profit rate, accumulation and the dynamics of long waves

Previous phases have ended with massive devaluation of capital combined with major recessions. Three historical precedent forms of devaluation include: inflation, which devalued both capital and debt as at the end of Phase A of the fourth wave, sparked by class conflict and rising energy prices, in the mid-1970s; wars, which destroyed capital and labor as at the end of Phase B of the third wave during the Second World War; and bubbles which suddenly devalued capital as at the end of the Phase A of the third wave in the 1920s. In order to consider these precedents and to compare them to the current situation, it is necessary to map the accumulation process.

The path of the profit rate in the most developed economies is controversial. Kliman rejects the financialization explanation for the decline in the rate of accumulation and growth and increasing debt argues instead that the rate of return on US corporate fixed investment fell through the whole post-War period, the half-century from 1948 to 2007 (Kliman, 2010, 2015). Although his empirical research finds some periods of rising profit rates (at the end of the 1960s and the 2000s), Kliman find that the investment share of profit has fallen since 1981, encompassing the whole neoliberal epoch (Kliman, 2015: 246, 248, 255). While concurring with his conclusions on the reduction of investment, other authors detect in the early 1980s stagnant or even rising profitability (Shaikh 2011; Kotz, 2015; Duménil and Lévy, 2016; Moseley, 2016; Roberts, 2016). As I shall indicate, the divergent interpretations are due to different methodological approaches for the measurement of the rate of profit.

Definition of the profit rate

The debate on the definition and measurement of the profit rate has long been marked by different insights in classical economics and, in particular, by Marx's polemic law of the tendency of the profit rate to fall. As this paper does not elaborate on the missing link of a theory of value in evolutionary economics, it will be restricted to some notes on this controversy.

Marx presented in the Book III of *Capital* the logic of the profit rate as a function of the surplus extraction and of the composition of capital (chapter 13), then some counter-balancing effects (chapter 14), including those augmenting the surplus rate (reduction of wages, further intensity of exploitation, unemployment), those affecting the organic composition (the rise of productivity of labor implies a reduction of the price of fixed capital and also of consumption goods), and those expanding the process of accumulation (external trade and the growth of capital as a financial stock), and finally the internal contradictions of the law (chapter 15).

Whatever the contribution from these debates, it remains that the profit rate expresses the evolution of social relations and should be interpreted as a historical process. Empirical research identifies both tendencies and counter-tendencies with evidence of over-accumulation of capital in the UK (Reati, 1990: 237), whereas other cases (France, Germany, Italy) show profit squeeze due to rising wages and no equalization across sectors (ibid.: 241). Other counter-tendencies include changes in taxation (Duménil and Lévy, 1999).

Usable definitions

For Marx, the rate of profit is represented as a ratio of the surplus rate to the organic composition of capital plus one. For Keynes, it is simply the marginal efficiency of capital. Both are tautological definitions. In the same fashion, the profit rate can be decomposed as the share of profit in output times the ratio of full capacity output to the cost of the capital stock, again times the capacity utilization rate (Basu, 2016) or as the profit share times the productivity of capital (Duménil and Lévy, 1999). Any of the latter are simply techniques to proxy the computation of the rate of profit defined in value terms to that computed in prices. Indeed, the use of Marxian categories or, for that matter, of classical economics concepts, based on value, would require a distinction between productive and unproductive labor, so as to measure the surplus (Shaikh and Tonak, 1994; Mohun, 1996; Moseley, 2016). A value-based measure of the profit rate would expose the impact of crystallized work putting live work in production, but the measurement is infeasible without a general reconstruction of the national accounts such as that attempted by Shaikh and Tonak (1994).

Given such obstacles, in the following I will consider three problems for the definitions using the conventional national accounts data: the computation of the rate of profit, the measure of capital, and namely the use of historical or current costs of capital.

Computation of the rate of profit

As a proxy for surplus, Kliman suggested the real value of property income, operationalized as profit deflated by the GDP price index, divided by the physical quantity of fixed assets. Profit would be the flow of income, measured either as net operating surplus (net value added minus labor compensation and taxes on production and imports net of subsidies) or profit before tax (net operating surplus less net interest and other payments and net business current transfer payments) as a proportion of the productive capital advanced (including for instance the inventory of finished products, or commercial capital; Kliman, 2010). Kotz defined profit as the after-corporate tax rate of profit for the corporate business sector (Kotz, 2015: 124). Reati preferred to compute the profit rate as a relation among profit, wage costs, and the price-composition of capital (Reati, 1990).

Other authors use the same strategy, filtering the national accounts variables in order to approximate the concept of profit in terms of aggregate value. Duménil and Lévy measure total profits as Gross National Product minus depreciation, income created by government, and total remuneration of labor, including a correction for the wage-equivalent of the self-employed, minus indirect business

taxes, and divided by fixed capital minus inventories to obtain the profit rate (Duménil et al, 1993, 1999, 2001). This would obtain the profit rate before interest payments, a measure close to that used in practice by firms.

These measures exclude residential capital and its actual or imputed income and benefits from agriculture and construction (Duménil and Lévy, 1999, 2002), which are controversial exclusions. The capital stock in each sector is defined by the authors as fixed capital and inventories, financial assets, and debt (net debt equaling total debt minus financial assets excluding shares), although only the values of tangible assets and inventories are typically available. For finance, the profit rate is computed the same way, the ratio of net product, minus labor compensation, taxes and net interest, to net worth at market value (Duménil and Lévy, 1999: 52), although this is also a crude approximation.

In any case, a measure of net profit can be obtained considering gross profits minus capital consumption allowances (statutory depreciation) and net interest (Boddy and Crotty, 1975), using corporate surplus and fixed capital stock as proxies for surplus value and capital advanced (A. Freeman, 2012), and corporate profit for nonfinancial firms (Moseley, 2016). This follows a suggestion by Marx, that a key determinant of accumulation is the “profit of enterprise,” the rate of return of industrial investment after all deductions, including the financial cost of capital including interest and taxes, or the reward of active investment after the reward of passive investment and the State (Shaikh, 2011: 46). Indeed, the profit rate relevant for firms includes dividends and inventories, representing the impact of its decisions, and interest and taxes, both expressing a power relation to finance and to the public authorities.

The measure of capital

The measure of capital has been an enigma for the definition of the profit rate. Three questions stand out: first, determining the value of net fixed capital involved in production, given the artificial measure of depreciation; second, distinguishing between accumulation (the growth of total capital) and investment (the growth of fixed capital) that is taken as a proxy (Duménil and Lévy, 1993: 97); and third, computing the total capital advanced for production. The last question is briefly discussed in the following lines.

Marx’s explanation of the function of interest-bearing capital and the division of surplus between interest and profit-of-enterprise gives insight on measurement. After considering industrial and commercial capital, which are part of the process of reproduction and realization of surplus, Marx describes the financial operation of interest-bearing capital:

“The owner of money who desires to enhance his money as interest-bearing capital, turns it over to a third person, throws it into circulation, turns it into a commodity as *capital*; not just capital for himself, but also for others. It is not capital merely for the man who gives it up, but is from the very first given to the third person as capital, as a value endowed with the use-value of creating surplus-value, of creating profit; a value which preserves itself in its movement and returns to its original owner, in this case the owner of money, after performing its function. Hence it leaves him only for a specified time, passes but temporarily out of the possession of its owner into the possession of a functioning capitalist, is therefore neither given up in payment nor sold, but merely loaned, merely relinquished with the understanding that, first, it shall return to its point of departure after a definite time interval, and, second, that it shall return as realized capital

- a capital having realized its use-value, its power of creating surplus-value" (Marx, 1977 [1894]: 323-4).

So, borrowed money becomes a commodity and is used as productive capital: "But in interest-bearing capital the first time M (money) changes hands is by no means a phase either of the commodity metamorphosis, or of reproduction of capital. It first becomes one when it is expended a second time, in the hands of the active capitalist who carries on trade with it, or transforms it into productive capital" (ibid.: 321). Therefore, in order to compute the profit rate, interest should be deducted as a payment to the creditor, and the remainder is profit-of-enterprise, or surplus, obtained through the operation of the advanced capital implicated in production, both industrial capital and the borrowed capital. In this case, money-capital owners constitute a particular social force, since "whether the industrial capitalist operates on his own or on borrowed capital does not alter the fact that the class of money-capitalists confronts him as a special kind of capitalists, money-capital as an independent kind of capital, and interest as an independent form of surplus-value peculiar to this specific capital" (ibid.: 350).

Applied to contemporary capitalism, this relationship is often subverted, as firms use part of their profit-of-enterprise to purchase financial titles, not to constitute a credit on some debtor's production, but rather to buy claims on the future global surplus. Thus, the surplus produced through the production process of a firm is used not only for accumulation and reproduction but also for stockpiling financial assets. The question arises: should that portfolio be considered as part of the advanced capital to compute the profit rate? The argument is that money capital is always a form of accumulation and all different marketable assets should be included as part of total capital spent (A. Freeman, ibid.). If so, the profit rate diminishes as the stock of financial assets mounts. Using US data Roberts finds that if profits are measured against the net worth of firms, and not just tangible assets, i.e., including financial liabilities (loans, bonds and shares issued), the fall of profitability is slower before the 1980s and the recovery quicker in 1982-97, but the rate of profit for 1997-2011 is lower (Roberts, 2016: 100).

Despite this plausible case for including all marketable assets, I argue it is inappropriate to include these financial values in the denominator of the profit ratio for the following reasons. A minor problem is double counting of credit by firms to firms. For that reason, Duménil and Lévy propose restricting the account to "balances of liquid purchasing power held by firms for transaction purposes" (Duménil and Lévy, 1993: 298), although transaction is a broad concept including many different assets. But the essential reason is Marx's: "the *sine qua non* of this function as capital is that they are expended as capital, i.e., are expended in purchasing means of production (in the case of industrial capital) or commodities (in the case of merchant's capital)" (Marx, 1977 [1894]: 320). Consequently, under this approach and for our computation, capital is to be considered uniquely a means of production of commodities.

Furthermore, financial assets should be divided in different categories: i) titles of credit applied in production to be considered as part of advanced capital by the borrower; ii) titles that do not represent ownership but merely a conditional payment, such as different swaps, which do not amplify reproduction nor reduce the period of circulation; and iii) titles that function as quasi-commodities - as

their price is not founded on value – which are not a form of money since they are no measure and no store of value, and are not capital since they are not the underlying security and have a limited validity. The last group is very heterogeneous, since many different financial assets have a fluctuating market price, virtually determined by the perception of their potentiality of capture of present and future tranches of the flow of surplus. But, as Marx put it, “the capital value of this security is still pure illusion” since they are money, not capital (Marx, 1977 [1894]: 432). Therefore, the market value of these assets is directly based on social power, namely power establishing the stability of the tools channeling surplus to the financial masters of the universe (in the derivatives business, it is five banks, JP Morgan Chase, Bank of America, Citibank, Goldman Sachs, and Deutsche Bank).

Derivatives, the largest category of financial assets, are used to hedge the risks of financial firms, and eventually to reduce transaction costs and the required capital reserves for the financial institutions, and to lower the perception of risks (Norfield, 2012: 117). But, unlike commercial capital, their value depends on the power of illusion, to paraphrase Marx; their value is their use, since they have no value. Take the example of Deutsche Bank and the notional value of its more than US \$42 trillion of derivatives, with an attributed market value of 0.047% of that sum. The profit rate would be infinitesimal if such value were considered as capital. But it is not capital. (Using a peculiar approach, the ECB regulators do not compute the value of those derivatives when they weight the risk of Deutsche Bank).

Replacement or historical costs of fixed capital

The Marxian concept of “profit of the enterprise” proposes a pragmatic approach to the measure of capital. This is why some authors suggest to value the fixed capital at its current replacement price and not at historical costs, with profit computed as the ratio of operating surplus to current-cost private fixed assets (Duménil and Lévy, 1993: 2; Reati and Toporowski, 2004; Moseley, 2009; Gutiérrez and Philippon, 2016). This definition includes the effect of changes of prices of fixed capital through innovation, market power, and crises.

Kliman and Chesnais proposed instead measuring capital according to its deflated historic, or purchase, price, and not the current, or replacement, price. After-tax profit would be computed as a percentage of the net stock of fixed assets, or accumulated investment, both net of depreciation but valued at historical cost (Kliman, 2010, 2015; Chesnais, 2016: 17). This choice has two major implications, compared to the alternative: the historical price in the denominator is lower but increases faster, implying a higher but rapidly declining profitability. A consequence is that Kliman challenges the measures pointing to a recovery in the 1980s and finds a declining profit rate after the turning point of the 1970s, only partially compensated by changes in taxes and interest. But other researchers using historical costs have identified a rise in the profit rate since 1982 (Roberts, 2016: 276).

Basu undertook a careful comparison between historical and replacement costs, and concluded that there is a threshold of inflation in capital goods that maintains a constant difference between the two measures. Examined at the endpoints, 1946 and 2010 a comparable percentage change is computed, but the

two approaches diverge substantially for the subperiod 1946-1982. After 1982, the difference shrinks because of rapid technological change and below-threshold inflation in the price of fixed capital (Basu, 2012).

2.5.3. The evolution of the profit rate

Different definitions lead to different methods and results. Empirical computation cannot exactly follow classical theory because the statistical data from national accounts do not distinguish hours of productive work. To probe the robustness of the results, I use two alternative measures of the profit rate, following Lapavitsas and Mendieta-Muñoz, who computed the profit rate using the methods of Duménil and Lévy and of Shaikh.⁹ The results are plotted in the next figures.

Figure 1:
Profit rate, computations by Duménil and Lévy (Method 1) and Shaikh (Method 2)



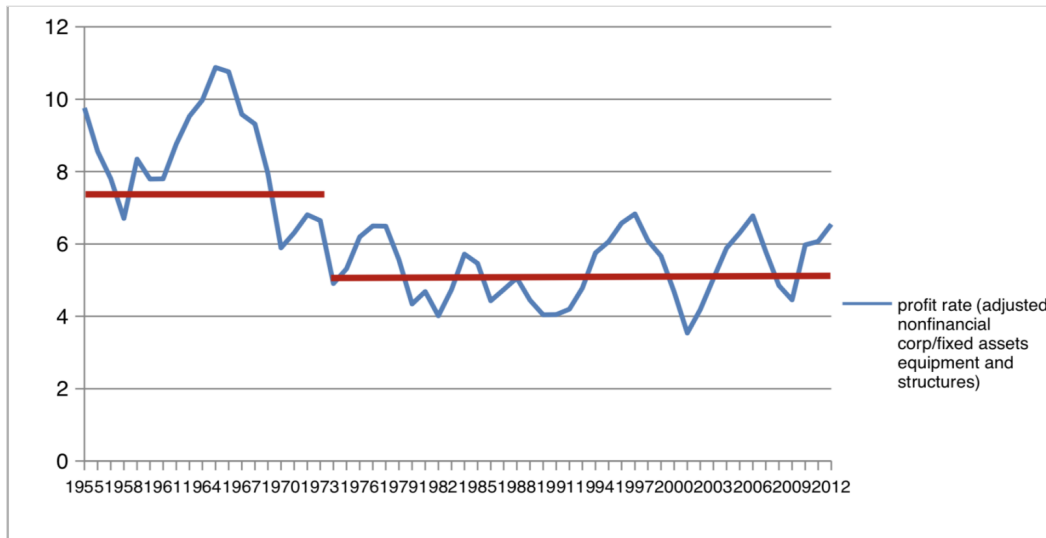
Source: Lapavitsas and Mendieta-Muñoz, 2016. “Table 1.14. Gross Value Added of Domestic Corporate Business in Current Dollars and Gross Value Added of Nonfinancial Domestic Corporate Business in Current and Chained Dollars”; “Table 6.1. Current-Cost Net Stock of Private Fixed Assets by Industry Group and Legal Form of Organization”; “Tables 6.16A, 6.16B and 6.16C: Corporate Profits by Industry,” *National Income and Product Accounts (NIPA)*, U.S. Bureau of Economic Analysis (BEA).

The profit rate is clearly cyclical in both cases, but the conclusions differ. According to Shaikh, the post-1970s is marked by business cycles with two deep recessions, the dot.com crash (2000) and the subprime crash (beginning in 2007), while following Duménil and Lévy the trough occurs in the early 1980s and recovery is only interrupted by the dot com and the subprime crisis.

⁹ Method 1 (Duménil and Lévy) is computed as: $((NDP - wL) / KN) * 100$, with NDP, Net Domestic Product; w, annual payment per employee; L, total private employment, then wL is the total payment to labour; KN, stock of net fixed capital, including equipment and structures. Method 2 (Shaikh) is: $(P / KN_{t-1}) * 100$, in which P is the non-financial corporate profit, computed at current cost with inventory valuation and capital consumption adjustment; KN as previous. Both are obtained in real terms.

If an average of the annual profit rate is computed for the two phases, a reduction of 36.7% is obtained from 1955-1974 to 1975-2012, as shown in Figure 2, following Shaikh's method.

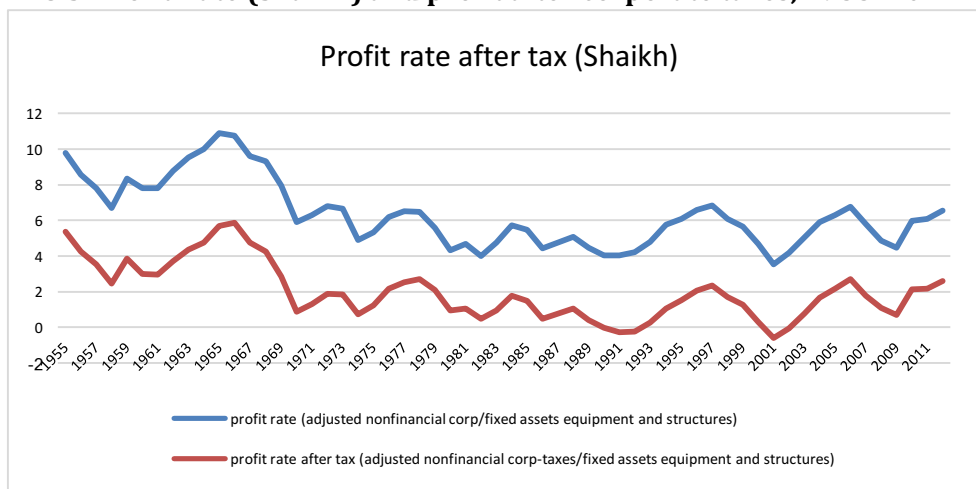
Figure 2:
Profit rate (Shaikh) in the two subperiods (Phase A and Phase B), for the US, 1955-2012



Source: Lapavitsas and Mendieta-Muñoz, 2016. Profit rate, adjusted, of the nonfinancial corporations/fixed assets equipment and structures, according to the definition of Shaikh. From "Table 1.14. Gross Value Added of Domestic Corporate Business in Current Dollars and Gross Value Added of Nonfinancial Domestic Corporate Business in Current and Chained Dollars"; "Table 6.1. Current-Cost Net Stock of Private Fixed Assets by Industry Group and Legal Form of Organization"; "Tables 6.16A, 6.16B and 6.16C: Corporate Profits by Industry," National Income and Product Accounts (NIPA), U.S. Bureau of Economic Analysis (BEA).

If the profit rate is net of corporate taxes, as exhibited in figure 3, we obtain a more realistic proxy for the "profit of the enterprise".

Figure 3:
U.S. Profit Rate (Shaikh) and profit after corporate taxes, 1955–2012

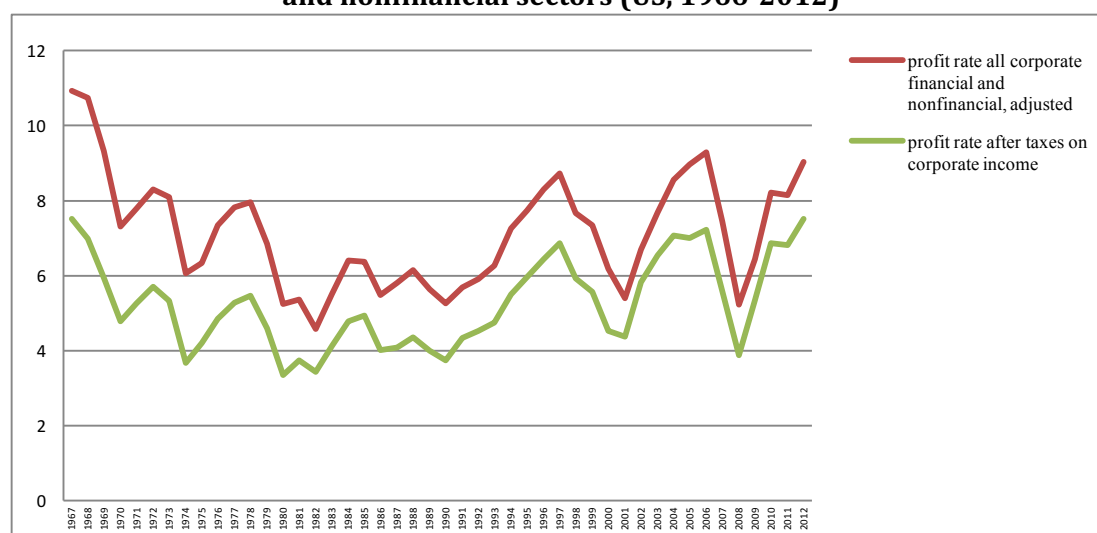


Source: *ibid.* Taxes on corporate income, same source.

A general decline in corporate taxation is noticeable, and there is substantial variation across sectors and firms, an effect disguised by averaging. But if the financial corporations are included, as in the next Figure 4, the reduction of the impact on the profit rate is obvious, as finance uses its power to obtain special deductions and exemptions. In fact, two thirds of the decline of corporate taxation in the US is attributable to the firms, primarily financial corporations, shifting profits to tax havens (Fiebiger, 2016: 19).

As indicated in the previous section, financial profits may represent some double counting. Nevertheless, as at least some of the surplus is captured in the sphere of credit and circulation, it is relevant to note the profit registered by the financial industry. Figure 4 shows that, if the financial sector is considered, the effect of taxation is more pro-business and anti-cyclical in recessions.

Figure 4:
Profit of the enterprise: profit rate for all the corporate sector, including financial and nonfinancial sectors (US, 1966-2012)



Source: Profit of Financial and non-financial sectors and Value of Non-residential fixed assets, equipment and structures, taxes on Corporate profits with IVA and CCA_{adj}, from the National Income and Product Accounts (NIPA), US Bureau of Economic Analysis (BEA).

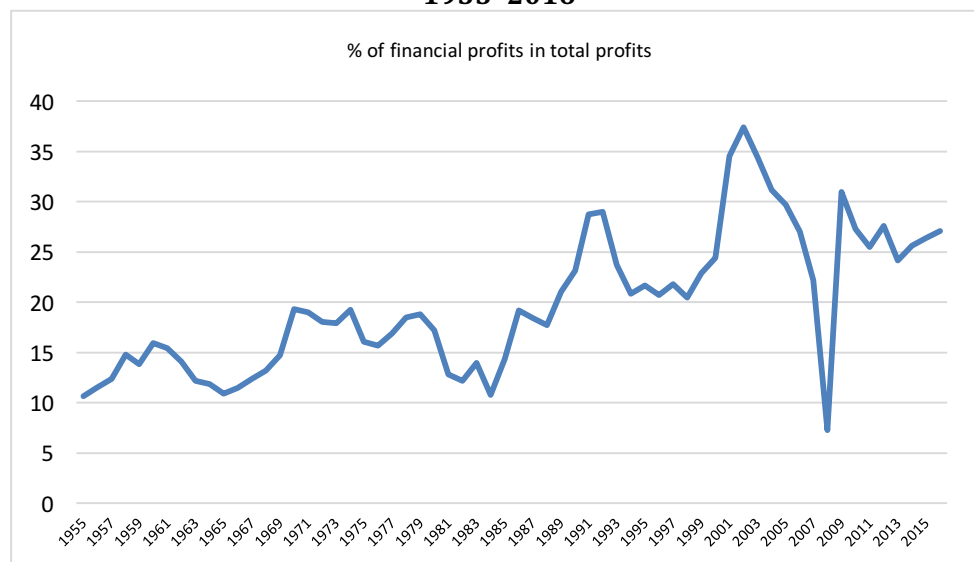
Finally, if the profit rate of the financial and nonfinancial corporate sector for the US if the real interest rate, as well as taxes, is considered, the combined anti-cyclical effect of the reduction of interest and taxes in periods of recession is more marked. The average annual rate of profit declines by 15.8% from Phase A (1961-1974, based on available data) to Phase B (1975-2012). In spite of the reduction of the price of capital, through the interest rate, profits are lower in the long transition after the turning point of the 1970s.

2.6 The financial system dominating the long Phase B

Finance and financialization are the theme for this section. As financial share of profits grows, a new regime of accumulation is defined through changes in the

flows of capital and profit. Figure 6 highlights the amplification of the share of finance in total profits for the US, which rose on average by 57% from Phase A to Phase B. Furthermore, the graph shows oscillations in the financial share of profits, with the subprime crash generating enormous volatility.

Figure 5:
U.S. Financial Profits as Percentage of Corporate Profits of Domestic Industries, 1955–2016



Source: Data on total profits, financial and non-financial, from the National Income and Product Accounts (NIPA), US Bureau of Economic Analysis (BEA). The average for each period is marked (1955-1974, 1974-2016).

Three interpretations will be briefly summarized in order to discuss this trend: the Post Keynesian view; the perspective of Lapavitsas; and finally the notion of “fictitious capital”.

2.6.1. What is financialization?

Financialization is “increasing orientation towards external financing, shareholder value orientation and the internal substitution of fixed investment by financial activity” (Tori and Onaran, 2017: 35) as part of the internationalization of production, labor, and value chains. This reorientation may constitute a distortion of the economy, generating monopoly rents (Krugman). Because profits are not retained for purchases of new fixed capital but expended as payouts to shareholders, financialization may lead to a shortfall of investment and, in a post-Keynesian framework, to a shortfall of aggregate demand. This suppression of physical investment highlights the distinction between capital as property and capital as function (Stockhammer, 2006; Cordonnier and Van de Velde, 2015), just as Marx did in volume III of *Capital* when discussing interest-bearing capital. The thirst for dividends as shareholders and managers look for short-term maximization is detrimental to capital accumulation, as proved by a 1995-2015 panel analysis of balance-sheet data for 2,881 non-financial listed European firms, which found financialization associated with increased financial payments but

stagnant or declining accumulation (Tori and Onaran, 2017). In the US from 1980-2015, dividends tripled as a share of the gross domestic income.

Lapavitsas, instead, puts financial expropriation and low interest rates, that represent public subsidy, at the center of his explanation for the current trend of rising financial profitability. He identifies the growing share of firms and household resources dedicated to credit payments as forms of financial expropriation. Even if the original source of surplus is production, the financialization of firms and households means that profit is redistributed in the sphere of circulation and finance. In this view, the interest rate is a crucial variable for the social control of expropriation (Lapavitsas and Mendieta-Muñoz, 2016). Lapavitsas also notes that, for the developed economies, the financial share of total profits “rose enormously” from 1980s to the 2000s, collapsed during the subprime crisis in 2007-9 and then experienced partial recovery. As a consequence, he stresses that financialization is a consequence and not a cause of the slowdown in accumulation (Lapavitsas, 2009, 2013; also Kliman and Williams, 2012; Chesnais, 2017).

If value, as embodied in commodities, is expressed in different forms, namely, money-capital, commodity-capital, and productive-capital, the financial system is a tool for shortening the period of circulation, diminishing costs and realizing surplus value. While it has been present from the origins of modern capitalism, the expansion of finance has changed the mode of equalization of profit. Also, as the knowledge-based and information-based economy grows, intellectual property rights and network externalities represent new forms of appropriated value. Globalization in that sense aggravates inequality, as finance concentrates resources in the dominant economies, which appropriate property rights, and financial agents capture a larger part of the pool of surplus value (Foley, 2013: 264, 266). “Fictitious capital” operates promoting that capture.

2.6.2. How fictitious is fictitious capital?

The term “fictitious capital” was not created by Marx, who quoted a Yorkshire banker, W. Leatham, referring to the inflation of means of circulation in periods of plenty (Marx, 1977 [1894]: 371). Fictitious capital corresponds to the extension of the third form of capital discussed by Marx in chapter 24 of Book III of *Capital*. Marx distinguishes productive capital, commodity capital, and money capital; the last is its most transitory form, as borrowing capital, financial capital, or interest-bearing capital. Yet money capital is the dominant form in the 21st century global capitalist accumulation regime.

For Marx, following the intuition of that Yorkshire banker, fictitious capital is the result of the expansion of credit and speculation. Fictitious capital is established by the capitalization of future returns of investment, financial operations, or payments of public debt, notwithstanding uncertainty. The legal title alone represents a specific extractive right for the accumulation of capital aimed at capturing future surplus, to be paid as taxes financing public debt or savings and exploitation of labor supporting private debt. Therefore, debt is the basis for fictitious capital, as it anticipates “future returns on investment in real and financial assets”, whose realization depends on the creation of future surplus (Roberts, 2016: 95).

It is fictitious in the sense that it is a “pure illusion” because even if the claims are met and do not prove fraudulent, there is no creation of additional value. It is an “ownership title” on one of the four derived forms of surplus: commercial profit, interest, rent, and the profit of firms. Furthermore, it may be fictitious from the point of view of the creditor but certainly not for the lender who already spent it (Duménil and Lévy, 2006).

As Chesnais points out, each title establishes the virtual rights of capital to a share of present and future surplus. It can serve as capital for its owners because it generates a flow of income and payments and can be bought and sold in a market, but it is fictitious from the point of view of total capital because it does not directly add to production of value. (It may indirectly establish differential access to means of investment and, thereby, production.) Fictitious capital also became an important part of the process of accumulation because it accelerates the circulation of capital and structures the distribution of and competition for surplus among capitalists, and therefore constitutes a form of revenue acquisition. In any case, the realization of this value depends on the capacity of producing enough surplus to satisfy the interest paid as capitalization of fictitious capital. When the opportunities for investment diminish, the possibility of devaluation looms (Chesnais, 2017; Minsky discussed the same point).

One may therefore ask if the concept is useful for providing a historical interpretation of long-term economic evolution. The semantic vagueness of the notion of fictitious capital has led some to dispense with it (Lapavistas and Mendieta-Muñoz, 2016). Yet its importance as a claim on capital makes it a convenient interpretative tool now that financial assets represent four times world GDP. Fictitious capital also offers insight into the dynamics of crises: a major difference between the Great Depression after 1929 and the great crash and recession after 2007 is that the subprime crash only destroyed a portion of the fictitious capital (Chesnais, 2016).

Capitalism is a monetary economy, and Marx noted that credit substitutes for money in the circulation of capital and commodities. The development of financial capital is a further step in that process and the notional global liquidity (bank loans, securitized debt, derivatives and the present value of other financial products) is in fact a measure of fictitious capital.¹⁰

Global capitalism is based on a larger-scale process, that follows a law of the boom of fictitious capital. When insufficient surplus generation yields a shortfall to meet the claims of fictitious capital, the law of value imposes its rule and a general devaluation may occur. This tendency forces institutional counter-adjustments to ascertain the value and priority of competing claims on capital with opportunities to collect rents through austerity, changes in regulation, and taxation. Competition for profit is assumed as a clear political dispute on the control of the power of the State, the law and the contracts to impose the rents supporting accumulation. The long transition of Phase B of the current wave

¹⁰ Already a classical economist, John Stuart Mill, noted that the expansion of finance leads to “irrational speculation” and then to “commercial crisis.” He argued that growth of capital following the expansion of industry would increase the danger of “irrational speculation” and crises. That was written in 1848: “Such vicissitudes, beginning with irrational speculation and ending with a commercial crisis, have not hitherto become less frequent or less violent with the growth of capital and the extension of industry. Rather they may be said to have become more so: in consequence, it is often said of increased competition; but, as I prefer to say, of a low rate of profit and interest, which makes the capitalists dissatisfied with the ordinary course of safe mercantile gains” (Stuart Mill, 1848: IV.II.24).

expresses those counter-tendencies. This is the reason for the instability of the present accumulation regime.

2.7. The divergence between accumulation and profit

As previously noted, the long downturn of the long wave was marked by slow accumulation in the core capitalist economies. By the time of the subprime crash, the share of US profits dedicated to investment had fallen to the 1949 level (Kliman and Williams, 2012: 25). Lack of investment after the last recession caused the developed economies to register the weakest recovery since 1947 (Roberts, 2016: 134). Indeed, the rate of investment diverged from the profit rate for some decades (Stockhammer, 2006) and this is true for the Eurozone as for the US.¹¹ Michel Husson and I expand on the tension between the profit rate and a mediocre level of investment (Husson and Louçã, 2012; Husson, 2014).

Many researchers note the divergence between investment and profit but lack consensus on an explanation. Gutiérrez and Philippon compare several analyses and find scarce evidence for the effect of risk premia as an explanation for the reduction of investment. They also consider financial frictions such as shortage of available safe assets, and globalization, but find more compelling evidence for the effect of short-termism and decreased competition promoting shares buyback instead of investment (Gutiérrez and Philippon, 2016). In the same sense, Lazonick observes the impact of shareholder maximization under what he termed managerial capitalism (Lazonick and O'Sullivan, 2000).¹²

In the final part of this essay, I will present my explanation for the divergence and argue, as you may suspect, that the scarcity of investment expresses the absence of socio-institutional conditions to support a new mode of development.

2.8. Conclusion: technological paradigm and accumulation regime

As Time Goes By explored how the potentialities of diffusion of major innovations changed the processes of production and distribution of goods and services and, thereby, the organization of the economy. As pointed out in the book, in early example in the Industrial Revolution is the demonstration effect of Arkwright's water-frame, which was so powerful that it led some of his rivals and competitors to attempt the physical destruction of his equipment. Despite this hostility, the successful and highly profitable operations of Cromford mill and his other factories stimulated numerous imitators to invest in cotton mills, especially after the expiry of his disputed patents. The success of these new technologies favored the generalization of the new paradigm: in Britain, early canal

¹¹ There are divergent interpretations about this process: Artus argues that investment in volume is coherent with Tobin's Q and, as a consequence, firms do not need to invest more and yet they collect exceptional profits (Artus, 2017), whereas Gutiérrez concludes that private fixed investment in the US has been weak for the last three decades, as compared to profit rate and Tobin's Q (Gutiérrez and Philippon, 2016: 46).

¹² Kliman contradicts the thesis on the reduction of accumulation. Although noticing a large increase of stock repurchases and dividend payments, he explains the fall in accumulation entirely by fall in the profit rate. Furthermore, he attributes the increase of financial activities to access to credit (Kliman and Williams, 2012).

investments, such as the Worsley-Manchester Canal, made large profits. On a far greater scale, the Rainhill Trials of various steam locomotives, followed by the successful and profitable operation of the Liverpool-Manchester Railway, led to an enormous boom in railway investment and, indeed, exaggerated estimates of the potential profits fueled a huge financial bubble. Railway promoters, such as George Hudson in Britain and the Vanderbilt in the United States, also made huge profits from speculation and financial manipulation.

The profits of Carnegie, Krupp and Ford demonstrated the fortunes that could be accumulated by successful entrepreneurship in a new dominant paradigm. More recently, the profits of IBM and then those of Alibaba, Amazon, Apple, Facebook, Google, and Microsoft are hugely impressive as they have become some of the most profitable firms in the world. The constellation of innovations, products and processes generated by the information and communications industrial revolution created new forms of investment, accumulation and realization.

A distinguishing recurrent characteristic of the long waves is that in each case, although the individual innovations were unique and distinct, a cluster of innovations emerged which offered the clear-cut potential for large profits, based on proven technical superiority to previous modes of producing. Minor incremental improvements were, of course, occurring all the time, but the innovations, which were at the heart of each wave, offered quite dramatic changes in productivity and profitability. However, these highly profitable innovations were not isolated events but part of a constellation of inter-related product, process and organizational innovations. Sometimes it was a new *process*, which generated the main super-profits, sometimes it was an array of new products, sometimes it was mainly organizational changes, as in the case of Ford's assembly line or the Internet, but, in all cases, there were interdependent developments, both technically and economically. That is how a techno-economic paradigm is generated.

Each techno-economic paradigm corresponds to a dominant regime of accumulation. In the long downturn of the fourth long wave that regime is financialization. The concept of financialization synthesizes two trends: a peculiar reconstitution of social power (among different sectors of the bourgeoisie, with the prevalence of financial giants) and the dominance of a specific form of extraction of surplus (through the rents captured by fictitious capital).

Financialization, or globalization, prevails to an unprecedented extent : in 2015, Facebook, which bought Instagram and WhatsApp, was worth five times the market value of General Motors, or more than General Electric, JP Morgan Chase, or Wal-Mart; and Apple's value was larger than the combined value of General Electric, General Motors, Wal-Mart, and MacDonal's. From 2010 to 2013, George Soros has been able to extract more profit than Warren Buffet plus Walt Disney plus Apple (Freeland, 2014: 195).

The financial system was the originator of the subprime crash. Indeed, by the 2000s, as the expansion of fictitious capital dominated finance, a new institutional framework emerged to recycle credit and financial assets. That was the shadow-banking machine, bank-like functions undertaken on a massive scale without the public regulation, oversight, or insurance required of traditional banking. By the beginning of the new century shadow banks intermediated a huge share of the global savings. From roughly 5% of credit creation in 1945, when the wings of the crisis began to spread in 2008 shadow banking constituted more than 60% of the

credit transformation. The main supplier of credit had shifted from the traditional banks to the shadow system, and the financial interlinkages amplified the stampede when the first funds ceased payments. Shadow firms dominate in the top five shareholders of the largest US banks: BlackRock is the first, Vanguard the second, and State Street the third shareholder in the major banks (JP Morgan Chase, Bank of America, Citigroup) and BlackRock is second and Vanguard is third in the other largest bank (Wells Fargo).¹³ BlackRock, Vanguard and State Street, taken together, are the largest shareholder in 40% of listed US firms, which represent 80% of that economy (Azar, Raina, and Schmalz, 2016). By itself, Vanguard owns around 5% of all US public companies and 1% of those abroad (*The Economist*, 11 June 2016).

In fact, the subprime crash confirmed the dangers of leverage and dissemination of toxic assets through the financial system. The subprime market itself was small, accounting for just US \$1 trillion out of the US \$12 trillion value of all outstanding US mortgages, and the whole US stock market represented around US\$18 trillion. Even if half of the subprime mortgages were entirely lost, it would account for no more than 3% of the stock market. Nevertheless, the panic propagated through the interlinked system and, even when buffered by massive and unprecedented intervention by central banks, provoked the first global reduction in GDP since the end of the Second World War.

Nevertheless, this shadow system weathered the crash and revived long before most of the global economy. Seven years after the 2007 crash, the mountains of debt increased in the dominant economies plus China from US \$142 to 199 trillion,¹⁴ and the banking assets are now larger than on the eve of the crisis.

In summary, in the neoliberal period, four processes influenced the evolution of the rate of profit: first, the wage share of total value added declined; second, the reduction of policy interest rates augmented the “profit of the enterprise”; third, austere fiscal and budgetary policies have protected profits; fourth, transfers of public resources have financed and bailed out private capital. Furthermore, massive injections of liquidity by the central banks promoted low interest rates, thus reducing the cost of fixed capital and of portfolio investments. But these processes were insufficient to restore the profit rate, which is the theme for the next section.

3. Stagnation, a long downturn or business as usual?

During the Phase B of the fourth long wave, the average profit rate in the developed economies was inferior to that of the previous period. The economic regime was also dominated by the emergence of fictitious capital as one of the pillars of accumulation, and the tendency of fictitious capital to boom and to devalue led to the financial crash of 2007-8.

In this section, these changes and their impact on the social conditions for the realization of surplus are discussed. Erosion of the capacity for popular resistance

¹³ From 1996 to 2016, 37 of the largest US banks merged into these four dominant banks (Citigroup, Morgan Chase, Wells Fargo, Bank of America). Therefore, three financial firms are the largest shareholders of the four largest banks, themselves representing a ten years process of concentration of three dozen banks.

¹⁴ McKinsey Global Report 2015, “Debt and not (much) Deleveraging”.

to the changes imposed under the new techno-economic paradigm has resulted in a surge of inequality. Yet, in spite of setbacks for the workers' movement, the new institutional framework remains incomplete and still requires substantial consolidation.

3.1. Social regulation, the institutional conditions and the mismatch

In the framework of Freeman's interpretation of economic dynamics, the question is: how is the socio-institutional framework now being adapted to consolidate a new accumulation regime that can exploit the potentialities of a techno-economic paradigm which has been available for almost 30 years? In order to answer, I look at some dimensions of the mismatch: first, the notion of crisis of adjustment is introduced; second, evidence of social conflict is discussed; and third, the consequence in terms of inequality is dissected.

3.1.1. The impact of a crisis of adjustment

In particular during periods of downturn of the long wave, as the available technologies are used to change the mode of producing goods and services, workers are confronted with new rules, including the emergence of new professions and changes in their way of living. Crises of adjustment are generated through changes in the conditions of work and pay, in technical education and in other norms affecting contracts, social traditions and culture. In general, these crises of adjustment are expressed as periods of high unemployment. Creative destruction is also at work destroying capital.

History also shows that the expansionary impetus from the new technologies may be so great that it imparts an upward thrust to aggregate industrial production and GDP, despite the structural crisis of adaptation and high levels of structural unemployment. This was the case in Britain in the 1830s and 1840s and in the United States in the 1880s and in the 1920s. On the other hand, the tempestuous growth of the automobile and oil industries in the 1920s was not sufficient to overcome the depressive trends in the US and the world economy in the 1930s, exacerbated by severe political, distributional, international, and monetary crises.

In any case, recurrent high levels of structural unemployment are always a manifestation of adjustment crises in each long wave. The statistics for the nineteenth century are incomplete, but there is strong evidence of serious unemployment in Britain in the 1830s and 1840s, in most industrial countries in the 1880s, and especially in those countries which were most advanced in the use of machinery. There is, of course, abundant statistical evidence of the heavy structural unemployment in the 1920s and 1930s and again in the 1980s and 1990s until nowadays. Even in the 1920s boom in the United States, there were sectors experiencing severe adjustment problems, such as coal, railways and ship-building. In Germany and Britain, heavy industry and especially steel and ship-building experienced prolonged problems of structural adjustment. In the 1980s, the automobile industry, the oil industry, the synthetic materials industry and, again, the steel industry experienced severe problems.

It is quite obvious that such extensive changes as mechanization, electrification, motorization, and computerization have led to a variety of conflicts in each successive crisis of structural adjustment. The depth of the social contradictions, which may be exacerbated during a crisis, is clearly illustrated by the labor conflicts it engenders. These are not adequately understood by the available models of political business cycle.

3.1.2. Models of Political Business Cycle

In spite of the early definition of economics as *political economy*, the neoclassical paradigm ascendant by the late nineteenth century ignored the social variables that describe the evolution of the system as a whole, even if it is quite obvious that the production and distribution of wealth, access to material and immaterial goods, and the power to influence, to regulate and to determine social and technological developments are drivers of economic change.

Veblen, with his essay of 1904, was one of the first prominent economists to contradict that trend and to discuss the role of power, namely that of big business. He noted that the huge capital investments required at that time were promoted by coalitions of businessmen and that the Captains of Industry concentrated power (Veblen, 2003 [1904]: 17, 18). His argument was that the use of credit and new technologies and the pursuit of dominance by the capitalists would create unstable systems, with the State ultimately organizing accumulation: “The quest of profits leads to a predatory national policy. The resulting large fortunes call for a massive government apparatus to secure accumulations, on the one hand, and for large and conspicuous opportunities to spend the resulting income, on the other hand; which means a militant, coercive home administration and something in the way of an imperial court life” (ibid.: 188). Veblen’s intuitions were ignored in the mainstream and insufficiently pursued by the Institutionalists in the following decades.

The focus on power and coordination was only revived when Kalecki presented his model of a political business cycle in 1943. At that time, the author simply wanted to understand big business opposed full employment, even if their profits would increase with expanded demand. The reasons were found to be political and determined by the social influence of business on government. Even if limited to counter-cyclical measures, public interventionism would reduce the sphere of action of capital. In the short run, a working class in full employment was feared to be less disciplined. In the long run, business leaders suspected the inertia of a democratic State would eventually damage their interests (Kalecki, 1943: 325). Kalecki’s model introduced social classes into the analytical framework: power, or the social instinct of the capitalist class, prevented the acceptance of higher profits under full employment (ibid.: 326). The Keynesian circle had by the same time the same intuition, as Joan Robinson had put it early the same year: “The first function of unemployment (...) is that it maintains the authority of masters over men.”¹⁵

Pasinetti took another road. Contrary to the Solow framework, in which long-run balanced growth is exogenously given by population and technological change, the rate of investment responds spontaneously and obediently, and capital

¹⁵ “Planning Full Employment”, in *The Times*, 23 January 1943; the article was not signed but it is generally attributed to Robinson.

accumulation becomes constant, Pasinetti (1962) related the rate of profit to the distribution of income and growth, following Kaldor (1957). But he distinguished the social roles of capitalists and workers only by their differential propensities to save. Unlike some of Keynes's works, but not the *General Theory*, Pasinetti assumed the equilibrium condition of a closed economy, i.e., savings equaling investment with profit matching the interest rate in the long run (Pasinetti, 1962: 272). With the model thus constrained, the conclusion is paradoxical: social choices do not change the distribution between aggregate profits and wages, but workers get a new source of income because they acquire a portion of profits when their savings pay for part of investment. Savings by capitalists determine the rate of profit and capital accumulation (ibid.: 275). There is no room for conflict and social strategies.¹⁶ This is why Kalecki provides a superior basis for Freeman's project of mapping socio-institutional changes through time.¹⁷

3.1.3. Social conflict in the long waves

In a more empirical vein than the abstract model by Kalecki, the insightful economic historian Eric Hobsbawm suggested that social conflicts follow a historical pattern consistent with long economic fluctuations. His intuition was that the social conflicts were temporally clustered at the end of "long phases of development" or Kondratiev waves (Hobsbawm, 1964: 148). His four cases were the strike movement of 1847-8 at the end of the first wave, the 1868-1873 strikes at the end of the second-wave expansion, the 1889-1893 strikes at the end of the second-wave depression, and finally the strikes at the turning point of the third wave (ibid: 153). Mandel also associated intensification of class conflict with turning points (Mandel, 1995: 45). In this sense, Kalecki, Hobsbawm, and Mandel provide an interesting framework for the empirical assessment of social conflict in the long historical periods, namely to understand how and if these conflicts

¹⁶ In any case, this approach was rejected by mainstream economics. Three decades after Kalecki, Nordhaus redefined the agenda for the research on political business cycles, assuming rationality as he suggested an inter-temporal trade-off between inflation and unemployment (Nordhaus, 1975: 169). In this context, the dominant party of government should direct its efforts towards maximizing the vote function for the next election, subject to the restrictions of inflation and unemployment. So, a cyclical pattern is imposed not because of the unrepresentativeness of the government as in Kalecki's model — the dependence of the government on big business — but as a consequence of the manipulation of the cycle for electoral purposes. No social differentiation is assumed and the government is defined as representative, albeit the public choice is myopic. Furthermore, Nordhaus assumed that the electorate has no memory of past political choices: the successive events are heroically independent (ibid: 185). But the policy-makers know the system, unlike the voters, and act accordingly; yet the result is sub-optimum, with lower unemployment and higher inflation than in the optimal case. The empirical test used to verify the model, with 1947-1972 series for some developed countries, was inconclusive. Notwithstanding that failure, the acceptance of this model and its assumptions expressed a reduction of the research on the political variables and social distribution to an *ersatz* of equilibrium theories.

¹⁷ Alternative contributions persisted, some implicitly following Kalecki's agenda. For instance, Crotty discussed the business cycle as tools to boost profits using fiscal and monetary policy, as the pressure of unemployment optimized both profit and social control (Boddy and Crotty, 1975: 10). Other authors followed a different avenue, studying the connection between the changes of the economic fundamentals and the epochs of political domination. Those are the cases of the World Systems view of Serman (1992), who developed Weber's sequential scheme of political moods; of Devezas (ed., 2006) on the political and strategic implications of the long-term changes in international leadership; and of Li et al (2007), evoking the contribution by Braudel and Arrighi, defining cycles of accumulation and financial hegemony.

express resistance against some forms of change induced by the economic and technological possibilities.

The explanation of this clustering of social conflict provides clues on the mismatch, considering two conjugate hypotheses. The first is that technological revolutions deeply affect the rhythm of industrial organization, regional identities, the dynamics of urban structures, and the form of and relations among social classes. Social conflict depends of course on many more factors than the shape of technologies, capital markets, State intervention, and cumulative social relations and habits, but the framework for these variables is provided by the dominant techno-economic paradigm. For instance, changes in the patterns of leadership and workers' organization crucially depend on sectoral dynamics and occupational or professional changes associated with the dominant paradigm: e.g. in the pre-Fordist and Fordist regimes of mass production, intermediate leadership, i.e., shop floor supervision, was normally assigned to semi-skilled operatives in the largest industries (Shorter and Tilly, 1974: 105), whereas in modern regimes the supervisory functions are assigned to specialized staff.

The second basic hypothesis is that of the clustering of social conflict at the turning points of the long wave. In the long phase of a dominant expansionary trend, the worker's movement tends to build strong organizations, namely trade unions, on the basis of full employment. Consequently, strikes tend to cluster near the upper turning point, as was clearly the case with the 1808-1820,¹⁸ 1868-1873, 1910-1912,¹⁹ 1968-1969 and 1974-1975 periods.²⁰ Another form of clustering is related to the resistance to the adjustment process associated with the emergence of a new techno-economic paradigm, which takes place around the lower turning point of the wave. These adjustments may drastically change the daily life of the workers, demanding a change of skills and occupational or professional distribution, new rhythms and forms of mental and manual work, new forms of control and hierarchy, and the change of previous conditions of work. This was the

¹⁸ Gattei (1989) and Screpanti (1984, 1987) identified several strike waves, each being an individual historical process. The first wave, 1808-1820, was concentrated around the new centers of industrial production in Britain: Lancashire, Durham, Northumberland, Leeds, Bristol, and Manchester. A very specific feature of this period was naturally the Luddite movement (1814, 1816-1817), and the whole process culminated in the 1818-1820 strikes of textile workers. But shortly afterwards, France became the center of workers' insurgencies, namely in Lyon in 1831, in the 1832-1840 strikes, and again in 1893.

¹⁹ In the upturn of the second long wave, just before and during First World War, there were strike movements in different countries: general strikes in Russia (1905) and France (1906), a movement then extended to Berlin (1910), again to France (1911), to the Ruhr (1912), and to the unofficial strikes in Britain (1910-1915) and in the US (1911-1916).

²⁰ The last great strike wave of the 20th century was that of May-June 1968 in France and 1968-1969 in Italy, and it was prolonged until around 1974-5, with an extension to the countries then going through the fall of dictatorships (Portugal, Spain and Greece).

case in 1847-48, 1889-1893, 1920-1924, 1936²¹ and immediately after the end of the Second World War.²²

The United Kingdom is a telling example, considering its history of workers' organization and militancy (and the existence of strike statistics since 1890). It was the prime mover of some of the strike waves of the past (1808-1820, 1920s) and, for the first half of the century, strike movements closely followed the economic dynamics. After the defeat of the 1926 general strike and under the pressures of the Great Depression, strikes abated substantially, as evidenced by Roberts (2018) with Figure 6.

Figure 6:
UK strikes from 1916 to 1944



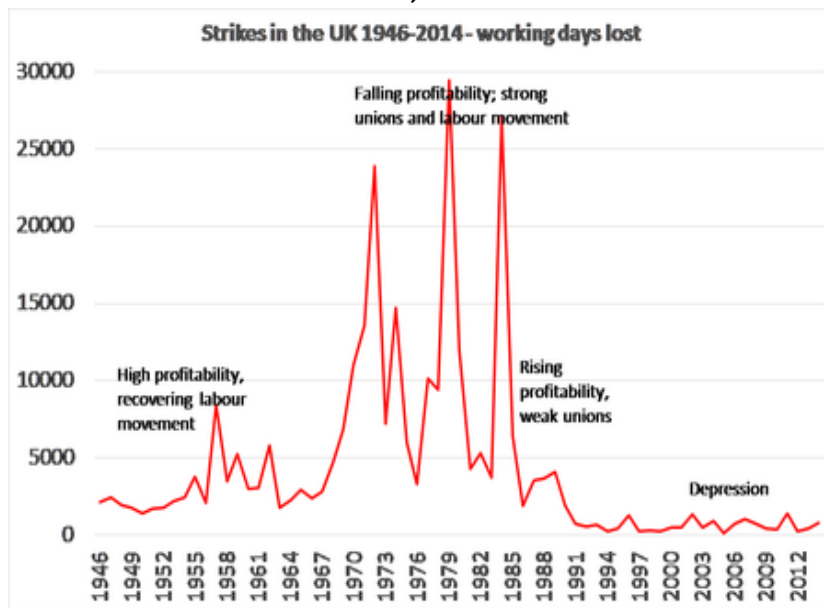
Source: Roberts, 2018. The author compares the strike movement and indicates the evolution of the profitability.

Then, in the post-World War period Britain went again through a major political shift (the *Labour* landslide victory of 1945 and the extension of the welfare state) and the economic expansion and full employment lead to a strike peak in the 1970s and 1980s, around the turning point of the fourth long wave (Figure 7).

²¹ After the end of the First World War new claims for wages, employment, new legislation, reduction of the working day and universal voting rights dominated the political agenda. In France, general strikes were called in 1919-1920; in Germany a revolution was avoided in 1923; in Britain the railwaymen and steelworkers took action in 1919, the miners in 1920, the shipbuilding workers in 1920-1921, the sailors and dockers in 1922-1923, and a general strike marked the peak of the movement in 1926. In Italy, there was a movement of occupation of factories in 1920. In the US, the peak of strikes occurred between 1919 and 1923 and these were severely repressed (Tilly, 1989: 436-441). The 1936 wave is centered in Spain, after a number of years of conflict leading to the proclamation of the Republic, and in France, leading to the formation of a new Popular Front government and to the Matignon agreements establishing the principle of collective bargaining, new rights for shop stewards, increases in pay, and the right to holidays.

²² That wave of conflict was centered in France, in 1947-1949, after the dissolution of the post-war coalition, and in Greece, where the partisans fought the Allied armies after having defeated the German occupation, and to a minor extent in Italy.

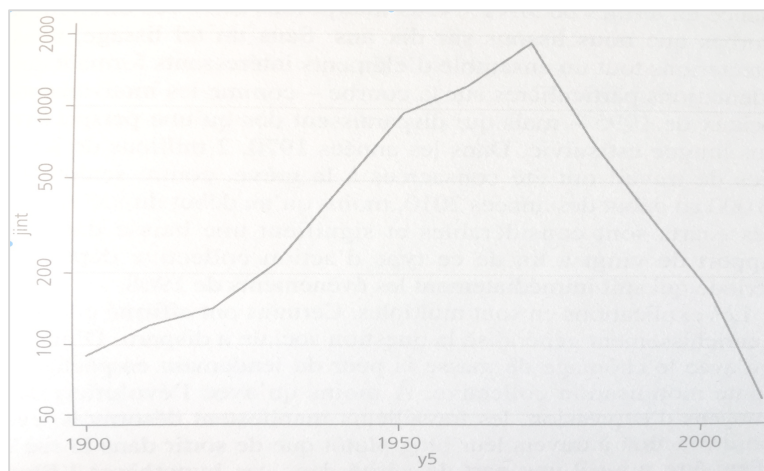
**Figure 7:
UK strikes, 1946-2014**



Source: *Ibid.*

The record confirms an intense history of labor conflict until the defeat of the miners in 1985. A researcher called the following period the “strike drought” (Lyddon, 2007). The defensive posture of the workers may be explained by a combination of factors: the severe defeats of the trade unions under Thatcher (and a process of marginalization pursued by Blair), a change in the social recognition and the perceptions of the working class, namely through financialization of households debt, and the vulnerability of labor contracts, as diverse precarious forms of contract became the norm for young workers and skilled professionals. The same story can be verified in other European cases, such as France (Fig. 8).

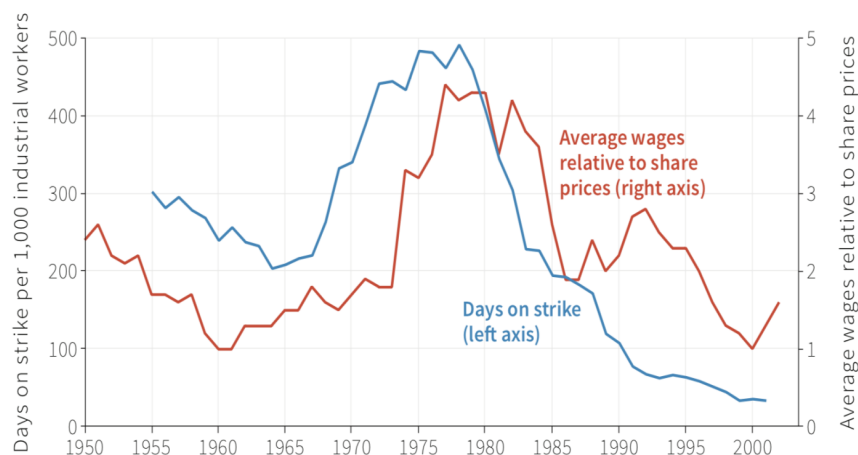
**Figure 8:
Strikes in France (1900-2015)**



Source: Chauvel, 2016: 163.

The record is similar in other European countries, and the strike movements in the UK and France can be taken as a general proxy for social tensions, proving that shortly after the turning point of the 1970s workers' capacity for resistance against regressive policies and aggressive employers was reduced. The result, for the advanced economies, is indicated by Fig. 9, which compares the days of strike per thousand workers in all advanced economies, and the average wage relative to share prices. The breaking point is the end of the Phase A, as expected, and a reduction of the workers movement is obvious, as it is the consequence in terms of distribution.

**Figure 9:
Days of strike and wages compared to share prices, for the advanced economies, 1950-2002**



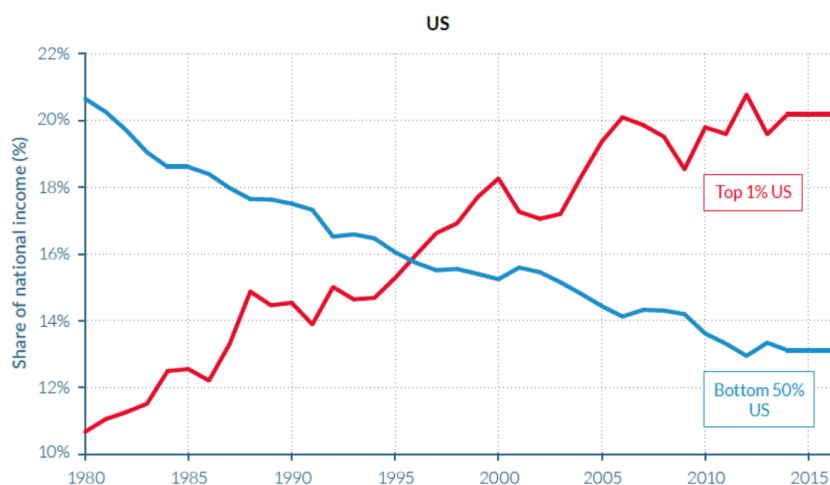
Source: Glyn, Andrew. 2006. *Capitalism Unleashed: Finance, Globalization, and Welfare*.

In spite of such lower popular militancy, the neoliberal program faced other substantial obstacles in the social and institutional framework, and therefore liberalization of financial flows, privatization of public goods, precarization of work, and globalization of markets were only slowly implemented.

3.1.4. Inequality as the new normal

The World Inequality Report 2018, as indicated by graph 9 for the US (1980-2016), presents a history of surging inequality. Comparing the US national income share of the bottom 50% and the top 1%, by 1980 the bottom part of the population had the double of the top 1%; by 1995, the balance was established; and by 2016 the upper group had already doubled the poorest half of the population. This is an extraordinary reversion, concentrating wealth to an unprecedented degree and at an unprecedented pace (Alvaredo et al, 2017), as shown by Fig.10.

Figure 10:
Part of the top 1% and the bottom 50% in the national income of the US (1980-2016)



Source: *World Inequality Report 2018*.

Several explanations are offered to this spectacular social change, which was replicated at varying speeds across the developed economies. For what matters to this section, I explore those explanations considering that inequality is both cause and outcome of the recent long recession.

Stockhammer argues that the subprime crash was provoked by the combination of rising inequality and financial deregulation, acting through four channels: the reduction of aggregate demand, or under-consumption; a global financial regime that permitted unchecked current account imbalances; higher household debt; and higher propensity to speculate (Stockhammer, 2013). While Stockhammer is a Post-Keynesian, the reader may be surprised by the concurrence of some economists of the IMF. “Widening income inequality is the defining challenge of our time”, write some IMF staff, as they note the highest gap between rich and poor for the last decades in developed countries and the damaging consequences for growth. According to these computations, a 1 percentage point increase in the share of the top 20% decreases medium-term GDP growth; a similar increase in share for the bottom 20%, increases GDP. The IMF authors decry the “decline of labor institutions” associated with technological change which contributes to inequality and concentrates “political and decision-making power in the hands of a few” (Dabla-Norris et al, 2015: 4, 5, 7). Other IMF authors note that “easing the labor market regulation is associated with higher market inequality and income share of the top 10%” (Fuentes Nieva and Galasso 2014: 26).

Other publications of the IMF emphasize similar points. Inequality, measured by the reduction of the labor share of national income, is aggravated in the framework of the larger decline in price of investment goods, a proxy for technological progress, in countries such as the US and Germany, although the effect is smaller in countries concentrated in services or finance (Belgium, Sweden) or commodity exports (Canada, Norway; IMF blog, 20 March 2017). Inequality in turn affects growth and stability (Berg and Ostry, 2011; Ostry et al 2014). Another link between inequality and growth occurs via the holding of

financial assets, debt, and financial fragility (Kumhof and Rancière, 2010; Kumhof et al, 2012). In the World Bank, the same type of research is conducted by Milanovic and his co-authors, namely on the historical evolution of the gains for the top 1% at the world level (Lakner and Milanovic, 2013). Although some mainstream economists still argue for the competitive advantages of inequality (Barro, 2000), evidence shows that inequality causes volatility.

The new attention to inequality from the IMF and the WB does not necessarily represent the world turned upside down, since it reflects the views of an academic research staff rather than an official reversal of policy, which remains essentially unchanged since the formulation of the Washington Consensus. Several highly regarded economists had already insisted on the same points, such as Stiglitz (on the danger of rents favoring inequality, Stiglitz 2012), or Krugman (2014). But it was up to Piketty and his team to collect historical data (Piketty and Saez, 2011; Alvaredo et al, 2013) and to propose a discussion on the causes and effects of inequality in advanced economies (Piketty, 2014), following Atkinson (1969, 2015).

The concepts and measures proposed by Piketty, who is responsible for the recent revival of the topic, are not without controversy. As his definition of “patrimonial capitalism” includes property income of land and shares, two problems arise for the computation of the rate of profit and accumulation. One is that this may lead to double counting of profit, rent, and interest; the second is that the measure is sensitive to financial fluctuations, because booms inflate the value of land and assets, artificially increasing the value of capital. That inequality has increased there is no doubt, but one may question if the dominant trend in modern capitalism is inequality because property income is growing faster than wages, or inequality because surplus expropriation has grown in relation to wages (Shaikh, 2016).

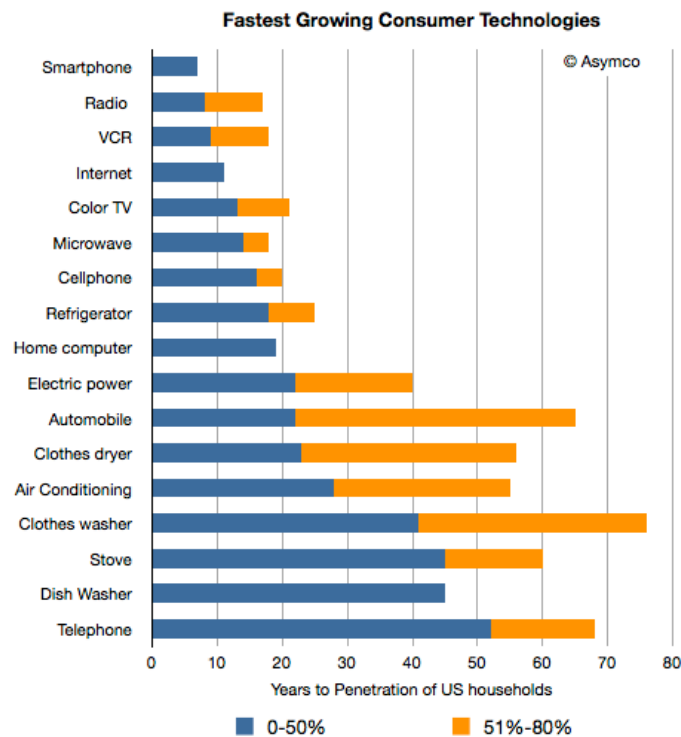
What drives inequality is in any case a toxic combination: for the well-off, financial rents, low taxes and high subsidies; for the destitute, unemployment, low wages, high taxes and fees, and a degraded Welfare State. The paradox is that social movements opposed to these trends were badly weakened by the end of the century, when such inequality was being aggravated. Furthermore, the consequence of globalization and neo-liberalization is further social inequality. But, given the framework, the difficulties for the victors to create a new socio-institutional framework is remarkable. As a consequence, without a coherent framework, the developed economies experienced a long period of transition with successive but insufficient changes of social structure. The question remains: why has the dominant class failed to establish and apply a new institutional framework conducive to growth? That is the theme for next section.

3.2. How the mismatch is being repaired

A new techno-economic paradigm was already constituted by the 1990s and 2000s. Its installation took long. If we consider the number of years required to achieve a dominant penetration of different consumer products, which is a proxy for the diffusion of some widespread technologies, as depicted in Figure 11 for US households, a pattern of long adaptation emerges.

The emerging history is not that of a simple acceleration: radios became widespread in less time than VCRs or color TV, but cell phones were much quicker than standard telephones. Smartphones have dominated in less than a decade, the internet took slightly longer. In other cases, there were social barriers for further expansion after 50%, such as with automobiles.

Figure 11:
Expansion of consumer technologies



Source: *The Economist* 13 April 2012, "GPT: The Revolution to come"

These products are applications of general purpose technologies and have the potential to reshape the economy and boost productivity. But, as with electricity and the automobile, they require a new set of infrastructures, production chains, forms of mass production, nationwide and international transport systems, dedicated energy network, changes in city patterns, adaptation of forms of production, and new legal and environment rules, but also business models, cultural norms and social behavior. So, even if the paradigm was mature by the turn of the century, in order to generate a new phase of growth, it should be articulated with a new socio-institutional framework allowing for its operation.

The failure of arranging this socio-institutional articulation prolonged the phase B of the fourth long wave, a period of global if irregular decline of the profit rate. It is not only social resistance, that waned well before the turn of the century, that explains this long transition; it is instead the fact that a long period is always required for the reconfiguration of institutions, namely imposing the hegemony of new ideas, providing the networks for dissemination and education, generating national and international leadership, selecting the cadre and imposing their authority through social discipline.

The following paragraphs briefly examine some of these processes of change, demonstrating how they required a long period of inception and maturation. The first is the education of cadre through schooling, ideology and networks. The second is the revolving door between business and politics and how it promoted deregulation and the prevalence of finance. The third is the process of change in the bourgeoisie and concentration of power.

3.2.1. Education and selection of cadre

Education, recruitment, reproduction and persuasion play a major role in the formation of the ruling elites and require generational transformations. As we will see through this section, long-term changes in universities, special programs for attracting foreign students to the US, who then would become decision makers, hiring strategies for essential institutions (central bank, government) creating invisible colleges, plus adaptation to membership of international fora (World Bank, IMF, private banks) and to external legitimation (by OECD, World Bank, IMF and other institutions), were crucial to change economic thinking and policy making in different countries. Some examples are indicated to illustrate each of these processes, following my recent book with a coauthor (Louçã and Ash, 2018).

Teaching

The careers of three Nobel Prize winners in Economics, Friedrich Hayek, Milton Friedman and James Buchanan, as well as the role of the Mont Pelerin Society have been discussed in depth (Mirowski and Plehwe, 2009; Burgin, 2012; Mirowski, 2014; Ban, 2016). Although marginal for the first decades of its existence, this network of neoliberal economists came by the mid 1970s to dominate academic departments, to influence major policy discussions, to shape the economic strategy of the Pinochet dictatorship (Hayek, Friedman and Buchanan), and soon after, to inform the economic regimes of Thatcher (Hayek) and Reagan (Friedman). But the most decisive contribution of the Mont Pelerin network to the neoliberal era was to prepare a large number of students to fill vacancies in universities, in the central banks, and in other official institutions.

The case of Latin America is a telling example. A program of teaching and networking was developed since the 1950s under the guidance of some US universities, achieving a decisive influence by the late 1970s in several countries. Arnold Harberger, from Chicago, was the dominant constructor, namely in Chile, where the program was successful, and in Argentina, where it had less impact. According to Harberger, the Chicago package of what he called “good economics” came to dominate nine institutions in South America: the two Chilean universities; in Brazil, the University of São Paulo and the Fundação Getúlio Vargas; the Universities of Cordoba and Tucuman and CEMA in Argentina, and in Mexico the ITAM and Colégio de Mexico.

Harberger also claimed that his courses trained more than 300 Latin American economists, among them 25 ministers and central bank governors. By the end of the last century, he reported that his students headed the central banks in Israel, Chile, Costa Rica and Argentina. Some years later, the count would include the former presidents of Panama and El Salvador, more than 45 cabinet ministers, and more than 15 heads of central banks (Levy, 1999; Harms, 2014; Fourcade, 2009:

180-1). In Chile he was the mentor of the “Chicago boys”, trying as well in other countries to promote his “good economics”. In these cases, he took several decades to construct the new programs, to educate disciples and to elevate their careers to the apex of the institutions.

The same path can be detected in other countries. In the case of Mexico, the instrumental institution for the establishment of neoliberal education was the central bank and the faculty it promoted. Babb, who wrote one of the most complete appraisals of these changes, summarizes the Mexican story: “From a historical perspective, the Banco (of Mexico) was the government organization most responsible for the Americanization of Mexican economics. The central bank was responsible for Mexico's first foreign scholarship program for economists and played a role in the founding of economics at the ITM (later ITAM) and the Colégio de Mexico and the renovation of economics at the University of Nuevo León. Furthermore, Bank of Mexico officials were instrumental in the remaking of ITAM economics into a much more Americanized program oriented toward sending students to postgraduate studies in the United States” (Babb, 2001: 126, also 189). As with the Bank of Mexico, the central banks of Colombia and Argentina constituted the anchor institution for the neoliberal turn in their countries (Urrutia, 1994; Dagnino Pastore, 1989). This intimate connection between the central banks as guardians of orthodoxy and faculties of economics reproducing the canon was crucial for the education of new generations of future policy makers.

Ideologizing

The second long process for the transformation of the neoliberal staff was the reproduction of the creed itself, in particular in the framework of the financial system.

These ideas became so hegemonic that in March 2007, well past the peak of the housing bubble and with foreclosures growing rapidly, University of Chicago Professor of Economics Austan Goolsbee, who would soon become the economic adviser for Obama's Presidential campaign and later the Chair of the Council of Economic Advisers, could still bring himself to remark in an opinion piece in the *New York Times* “the mortgage market has become more perfect, not more irresponsible” (Goolsbee, 2007). Indeed, financial theory rejected the evidence of a crash even when it was already breaking the walls.

Substantial responsibility for that goes to Eugene Fama, of the University of Chicago. One of the heavy hitters in academia, Fama got the Nobel in 2013 and was responsible for the construction of the canon in financial economics. His theory is a mixture of mystification on efficiently equilibrating markets and denial of real life tensions. Confronted by a journalist for the *New Yorker* with the facts of the credit bubble in the mortgage market, Fama could reply: “I don't even know what that means. People who get credit have to get it from somewhere. Does a credit bubble mean that people save too much during that period? I don't know what a credit bubble means. I don't even know what a bubble means. These words have become popular. I don't think they have any meaning” (Cassidy, 2010). As the journalist persisted, Fama emphasized that bubble has no meaning: “We don't know what causes recessions. I'm not a macroeconomist so I don't feel bad about that! We've never known. Debates go on to this day about what caused the Great

Depression. Economics is not very good at explaining swings in economic activity (...). If I could have predicted the crisis, I would have. I didn't see it. I'd love to know more what causes business cycles." Cassidy tried again: "Are the markets efficient?" Fama replied "Yes. And if it isn't, then it's going to be impossible to tell" (ibid.).

In spite of such innocence on the nature of the markets and their contradictions, Fama was able, with a resolute campaign from 1965 to the 2010s, to establish the dogma that is being taught to economic students. He took more than forty years to get the Nobel, in spite of his explanation of the efficient markets being a conceptual fraud. Nevertheless, it was instrumental for deregulation and the prevailing policies for at least the last twenty years.

Networking

You may educate them in the wonders of liberalization, but you also need to elevate them to power. So, selection is required for success. If the selection of cadre begins at school, their promotion to ruling functions is crucial for the reproduction of the ideas and decisions favoring liberalization. Again, the process of displacement of old ideas and pals is long, in particular in countries where the dominant views were opposed to the liberal agenda.

One of the reproduction processes is networking. Take the example of the decisions of the IMF on adjustment programs, which have been crucial for different economies in Africa or Latin America, or more recently in southern Europe. A scholar perused the connections among three hundred IMF staff members and 1,173 officials of 44 developing countries, including chiefs of government, ministers of finance and heads of central banks, from 1969 to 1998. The author then checked in detail 143 loans to 29 developing countries for the period 1975-1998, to conclude in both cases that better loans went to governments with officials sharing the professional training with IMF staff: "The results provide evidence that the staff provide favorable treatment to government officials with similar professional characteristics," namely education in US and UK economic faculties, and of course "countries where there is significant exposure to US commercial banks receive more generous loans" (Chwieroth, 2013: 286-8). Another inquiry on 486 loans by the IMF during the period from 1980 to 2000 proved that, when the local policymakers are neoliberal, the IMF adjustment program is more generous and requires lighter enforcement – this is again evidence of "playing favorites" (Nelson, 2014: 486).

The case of the Mexican mandarins is another telling example of networking, also proving the usefulness of the Americanization of the teaching of economics. When Carlos Salinas de Gortari, the president for 1988-1994, took office after a major debt crisis, he challenged the longstanding developmentalist views of his venerable nationalist party, the PRI, which dominated Mexico for 60 years, and delivered a radical neoliberal agenda. Although Salinas was a graduate from UNAM, which long held the torch for developmentalism in Mexican economics, he got a PhD from Harvard University (1978). As expected, Salinas selected many US graduates for his administration. His finance minister was Pedro Aspe (PhD at MIT, 1978), the minister of commerce was Jaime Serra Puche (PhD at Yale, 1979), the NAFTA's chief negotiator was Herminio Mendoza (PhD at Chicago, 1978), and the minister of budget was Ernesto Zedillo (PhD at Yale, 1981, then Salinas's successor as president). The combination of international finance pressures through the

debt crisis, and the rise of US and other foreign trained technocrats in government delivered the neoliberal reforms (Santiso, 2004: 33; Babb, 2001: 83, 171f, 191).

The Salinas privatization program reshaped Mexico: it included airlines, chemical and steel industries, national insurance companies and banks, television, radio and telephone, the communications system. Salinas also destroyed the rules of sharing community land, liberalizing land markets for sale or rental. In 1992, he signed the NAFTA agreement with US and Canada, assuring free movement of goods and capital. The combined impact of land privatization and agricultural market liberalization radically unsettled peasant and indigenous communities. NAFTA also reconfigured Mexican industry with the intensification of "maquiladoras", border factories for intensive use of labor for finishing products. The beneficiaries of NAFTA included Carlos Slim, whose adroit purchase of communications launched his fortune, which is now equal to 6% of Mexico's GDP (Rockefeller's wealth, in his best years, reached only 2% of US GDP, and Bill Gates today enjoys less than 0.5% of US GDP; Freeland, 2014: 260; also, Camp, 2002).

The example of Salinas in Mexico was mirrored by other ascendancies of neoliberal dignitaries to power in other countries, such as Fernando Henrique Cardoso in Brazil in the late 1990s or recently Mauricio Macri in Argentina and Sebastián Piñera in Chile.

3.2.2. The efficient revolving door

The second process to be described in this section, after that of education and selection of cadre, is social promotion connecting business and politics. In the book with Michael Ash, we investigate the revolving door in some national cases in great detail (Portugal, Spain) as well as in samples for other countries, finding evidence for strong links, namely between finance and top decision makers.

Goldman Sachs is one of the best-known examples. The firm regularly recruits distinguished politicians and happily lends its staff to public endeavors. The voluminous list of the GS administration includes Peter Sutherland, former Attorney General of Ireland, founding director-general of the World Trade Organization and European commissioner for competition, who became the non-executive chairman of Goldman Sachs International for ten years; Mario Draghi, former managing director of Goldman Sachs International, who became president of the ECB; Mario Monti, European Commissioner (1995-2004) and Italian prime minister (2011-3), former international adviser to Goldman Sachs; Petros Christodoulou, head of Greek debt management agency and former employee of Goldman Sachs; Lucas Papademos, former Greek prime minister (2011-2), head of the Central Bank when it hired Goldman Sachs for controversial derivatives involving Greek debt; Karel van Miert, former EU Competition Commissioner, ex-international adviser to Goldman Sachs; Otmar Issing, former board member of the Bundesbank and the ECB, adviser to Goldman Sachs; Romano Prodi, president of the European Commission (1999-2004) and Italian prime minister (2006-8); Malcolm Turnbull, prime minister of Australia (2015-present), a former partner of the firm; Carlos Moedas, European commissioner (2014-present); Robert Zoellick, who went from the leadership of Goldman Sachs' international affairs to the head of the World Bank and then back to chairman of the advisory board of Sachs; Antonio Borges, former head of the IMF's European Department and former vice-

chairman of Goldman Sachs International (and then the leader of the Portuguese government team responsible for an ambitious program of privatizations); and finally José Manuel Barroso, president of the European Commission for ten years, who replaced Sutherland as the chairman of Goldman Sachs. Goldman Sachs provided three of the last eight Secretaries of Treasury of the US. These are some of the distinguished men from Goldman Sachs at the top of governments and institutions, recruited by the bank after their political mandates, or promoted as policy making stars after the tenure at the bank.

In other cases, a career is built from the convergence of different professional experiences and ideas. Alan Greenspan, eventually the most successful recent case of the revolving door, a disciple of Ayn Rand, the conservative philosopher and novelist, began his career at Townsend-Greenspan, a New York consulting firm, then he was the chair of the Council of Economic Advisers under Gerald Ford in 1977, and later adviser to President Reagan. But prior to his appointment as Fed Chair by Ronald Reagan in 1987, most of Greenspan's time was dedicated to serving on boards of private firms, both financial and industrial, including the Aluminum Corporation of America, Automatic Data Processing, General Foods, J.P. Morgan, Morgan Guaranty Trust Company of New York, and Mobil. Appointed to the Fed, he served as Chair for 19 years under several presidents and gaining unparalleled power. He managed the Fed through significant crashes, the Savings and Loan scandal, the 1987 stock market crash, the 1997-8 crashes in Russia, Asia, and Mexico, and the 2000 burst of the dot-com bubble. After stepping down in late 2005, Greenspan took a job as consultant at Pimco, the largest player in the world bond market. A consistent man, he fought for deregulation for his entire career and in his practice he fine-tuned the liberal approach to financial markets.

Not surprisingly, Greenspan's argument for deregulation, reproducing his professional experience and ideological inclination, was that the market is wiser and more efficient than public regulation: "In the essence, prudential regulation is supplied by the market through counterparty evaluation and monitoring rather than by authorities (...). Private regulation generally has proved far better at constraining excessive risk taking than has government regulation" (Greenspan, 2005). Indeed, he did not invent the process of liberalization: as early as 1974, the US Commodities Futures Trading Commission Act accepted self-regulation in the derivatives market, where speculative contracts bet on future prices of assets, commodities, stock, and bonds. That was a pivotal change for nourishing new financial products that gave birth to modern shadow finance (Pistor, 2013).

But Greenspan, in his long tenure at the Fed, developed the theory and practice of self-regulation, fought those challenging it, and imposed laws and norms that would directly lead to the collapse of the subprime, something he lately accepted at a Congress hearing, saying that "it turned out to be much broader than anything I could have imagined", as a "once-in-a-century credit tsunami". Asked if he had been wrong on deregulation, he famously stated "Partially (...). I made a mistake in presuming that the self-interest of organizations, specifically banks, is such that they were best capable of protecting shareholders and equity in the firms (...). I discovered a flaw in the model that I perceived is the critical functioning structure that defines how the world works. I had been going for 40 years with considerable evidence that it was working exceptionally well" (*The Guardian*, 24 October 2008).

In the same mood, the US treasury secretary Henry Paulson, a Goldman Sachs man, self-criticized his failure to anticipate the collapse in the US mortgage

industry, “I could have seen the sub-prime crisis coming earlier”, before adding the utterly shocking, “I’m not saying I would have done anything differently” (ibid.).

But the reason why Greenspan, Paulson and others could not see it coming was because they could not conceive it coming, as they imagined their deregulation agenda would make the market efficient. Furthermore, the tools to anticipate problems were as deficient as the theory. Take the case of the tests on HBOS, a giant retail bank resulting from the fusion of the Bank of Scotland with Halifax, whose operations were centered on risky lending. A stress test conducted in 2005 led to the impressive conclusion that the possibility of the bank having three consecutive years of negative results would only eventually happen once in five thousand years. HBOS required rescue in 2008. In Iceland, where the four largest banks owned assets representing 900% of the national GDP, the stress test conducted in 2008 by the IMF claimed to find resilience and confidence, yet their collapse followed immediately. Indeed, stress tests constituted a peculiar form of organized misperception or ignorance. The same applies to the rating by the world agencies on different securities.

The construction of liberal markets required power and staff to dismantle the regulations, a distinctive ignorance of facts, the social consensus for proceeding and, for that, the education in what Harberger called “good economics”. Again, this process took the period of a generation.

3.2.3. Modernizing the bourgeoisie

The neoliberal concepts and policies came to dominate the developed economies through a long process of construction of ideas, teaching, recruitment, promotion and networking. They were built on social power, as constituted by the capital-labor relation, but required important changes, including new forms of accumulation.

The control of capital is historically very concentrated. Take the case of Italy, where the Agnelli family has dominated a full 10% of the stock market. Although a large share by European standards, this is not unheard of in the ecosystem of capital. It is quite common to find powerful dynasties in charge of large parts of the economy. In Asia, dynasties are even more prevalent: the top fifteen families of Hong Kong have wealth equal to 84% of GDP; the equivalent figures are 76% in Malaysia, 48% in Singapore, and 47% in the Philippines. In Europe, the examples abound: the top ten families in Portugal controlled 34% of the market capitalization (until the 2014 collapse of the Espírito Santo financial group, owned by one of the most powerful of these families); the figure for France and Switzerland is 29% in both cases. In Germany, the Quandts are the major stockholders of BMW, Mini, and Rolls Royce. The two largest Swedish groups owned 63% of the value of all listed firms at the end of the last century. The dominant group, the Wallenberg family, represents by itself almost half of the capitalization of the Swedish stock market and has spread its fortune into shares in Ericsson (20%), SAS, Nasdaq, ABB, SAAB (40%), Electrolux (30%), Atlas Copco, AstraZeneca, the drug maker, Caffé Ritazza and dozens of other companies. The group sprang from a bank created 160 years ago, the Stockholms Enskilda Bank, leading to the development of diversified investments, always under the prudent dictum of the family, “Esse non videri,” to be, not to be seen (Barone and Mocetti, 2016; Belenzon, Chatterji, and Daley, 2017: 1653).

The story holds all the more in developing countries. In Ecuador, the Naboa family owns the production of bananas (the Bonita brand, the world's fifth largest producer), and 40% of national exports. In India, the Tata, Birla, and Hinduja families dominate the economy. Many other examples confirm this historical trend of dominant families in big business.

Yet, although family big business dominates in several economies, many of the current fortunes are new ventures: according to Forbes, 840 of the world's 1,226 ultrabillionaires in 2015 were "self-made". In some cases, such as that of Italy, new entrepreneurs rub elbows with traditional elites: in the Forbes list of the world's billionaires, among the first two thousand are five Pradas, the oldest family in business, and the newcomers, four Benetton, one Dolce, one Gabbana, and one Armani. The 2018 list of 2,208 billionaires, with an average of US\$4 billion each, confirms the trend, as 259 are newcomers, with China topping the list. Finance gets 310 places in the list, retail and fashion 235, real estate and manufacturing one tenth each.

In spite of the historical differences between the entrants and the old blood, there are also some similarities, as the newcomers are frequently beneficiaries of public favor, as the capital aristocracy. Evidence is the direct involvement of political ruling families in business: firms representing no less than 8% of the total world market capitalization in 2003 were run by relatives of their countries' political leaders (Faccio, 2006). This is true in particular in cases of recent reconfiguration of capital ownership. In China, no less than 103 descendants of the "eight immortals" of the Mao Zedong era held ruling positions in state-owned firms.²³ Three of them run firms with combined assets amounting to one fifth of the Chinese economy (Oster et al., 2012). In the giant firm Dalian Wanda, operating in real estate – it claims to have "120 times more employees than the Vatican" and owns properties in Beverly Hills, the AMC Theatres, and 20% of the Spanish football club Atletico Madrid – stakes are reserved for the elder sister of current President Xi Jinping and the daughter of former prime-minister Wen Jiabao.

In many other countries, the public authorities provide contracts, in particular in monopolies or oligopolies, that are decisive for accumulation of capital and for the enlarged reproduction of the bourgeoisie itself. For India, the Forbes world list of billionaires included 46 persons and almost half of them operated in rent seeking sectors, such as real estate, construction, cement, media, infrastructure and mining, in 2012. That was the case of Mukesh Ambani, the richest person in the country. Other cases of politically connected billionaires are conspicuous in the list: in Nigeria, Folorunsho Alakija got her fortune from the oil license; Carlos Slim, one of the richest billionaires on Earth, got his fortune from politically motivated privatizations in Mexico.

These contracts and concessions generate new entrants in the bourgeoisie, as entrepreneurs are chosen or favored by political power. Those would also be the cases of Terry Gou, from Taiwan, who founded the electronics giant Foxconn and who is China's largest exporter, with one million employees; of Zhou Qunfei, the world richest self-made woman, who owns Lens Technology; of the two internet giants, Jack Ma (Alibaba) and Robin Li (Baidu); or of the largest drug maker from India, Dilip Shanghvi, owner of Sun Pharmaceutical (Dolan and Kroll, 2015; Freund and Oliver, 2016). The most prominent capitalist in this list, Jack Ma, who owns a

²³The eight were Deng Xiaoping, Wang Zhen, Chen Yun, Li Xiannian, Peng Zhen, Song Renqiong, Yang Shangkun, and Bo Yibo.

majority stake at Alibaba, is sheltered by the Chinese government from competition in the home market and is a partner of the national social security and sovereign funds, and of a Japanese bank.

The revolving door mobilizes public resources and the power of the State to abet private accumulation. That also explains the long time that is required for the operation. A case study is that of Russia, in particular when then President Yeltsin initiated a first phase of mass privatization. From 1992 to 1994, the ownership of 70% of medium and large-sized public enterprises was transferred, ostensibly through the issue of vouchers to the general population but which were rapidly accumulated by the wealthiest. From 1994 to 1997, the government borrowed heavily from banks, offering the ownership of large firms as collateral, in what came to be known as the loans-for-shares agreements. In practice, this meant that a handful of oligarchs were selected to manage the firms involved in mineral extraction and export. Large international banks financed this process, such as Deutsche Bank.

By comparing the voucher auction prices of the first phase of privatization (1993-4) with the stock market prices for the same firms in August 1997, the dimension of this theft can be assessed: Gazprom, the largest gas producer and distributor, increased in value by a factor of 162, from US \$250 million to US \$40.483 billion; United Energy Services, a provider of electricity, increased its value 19 times; Lukoil, Yukos and Surgutneftegas, oil producers, respectively increased their value 22, 18 and 84 times (Klebnikov, 2002).

This form of primitive accumulation of capital is one instance of the political processes of enlargement of the capitalist class by direct political intervention. It is not an unprecedented form of action, but the privatization waves became a mold for the neoliberal era.

3.2.4. Shocks moving the liberalization process

The adaptation of the socio-institutional systems proceeded during the 1970s and the 1980s through shocks, which determined different forms of social and economic change. It was the case of Chilean hyperinflation and the balance of payments crisis in 1973 and then the military coup, but also of the British pound crisis in 1976, then the radical program of Margaret Thatcher and the defeat of the miner's strike, marking a new relationship of forces in social life, then the victory of Reagan and in particular his ability to fire the air traffic controllers and to crush their union. Other shocks were the Mexican debt collapse in 1982, the failure of the French government expansionary policy in 1981, the IMF intervention in Portugal in 1983.

These shocks opened a road for liberalism through means that could be ideological (as in Britain under the pressure of the IMF), authoritarian (as Chile, under a dictatorship) or pragmatic (as in Mexico and France). The change could be imposed through a financial crisis (as in Mexico and Argentina) or through largely domestic transformation of the state apparatus (France, Brazil and China) or the emergence of a governing elite subordinated to the financial interests (Portugal and Spain).²⁴ But regardless of the pathways, the remarkable feature of this period

²⁴ Babb, 2001: 189. Also Camp, 1990, 2002; Fourcade-Gourinchas and Babb, 2002; Fourcade, 2009. Different views on social reproduction are Domhoff (1983), who discusses the relation between the ruling

was not the particular enabling shocks but the coalescence on a single direction of change towards establishing neoliberalism as the law of the land, requiring a large political consensus, a motivated personnel and strong links among them and the economic forces.

3.3. Secular stagnation or a long period of low accumulation?

Impressed by the length of the recession ignited by the subprime crash, in 2013 Larry Summers resurrected Alvin Hansen's presidential speech to the American Economic Association by the end of 1938 and the concept of *secular* stagnation (Hansen, 1938; the first mention to the concept being Hansen, 1934). The following intense debate on the concept, from academics (Teulings and Baldwin, 2014) to institutions (Gimdal and Karakas, 2016), reveals more on the state of macroeconomics than on the economies per se. This section does not enter the details of this discussion but points out the difficulties of an analysis of crises without a concept of cycles.

Teulings and Baldwin define stagnation as that period, after the financial crash, when negative interest rates would be required to equate savings and investment at a level of investment consistent with full employment (Teulings and Baldwin, 2014: 2). But the problem is that this definition of stagnation is tautological because it depends on the concept of the interest rate equating savings and investment resting the equilibrium condition on the variable that gives the least insight into the nature of economic fluctuations. Furthermore, as their explanatory variable is the interest rate, these economists take the consequence as the cause.

For Summers, the unbalance between the higher propensity to save and the lower propensity to invest implies deficient aggregate demand and has an adverse impact on future output. Krugman identifies the liquidity trap under self-sustaining pessimistic animal spirits. Not surprisingly, these authors are skeptical about solutions from conventional monetary policy. They refer two major reasons for skepticism. One is the set of structural demand conditions. Summers points out the impact of ageing societies requiring larger savings, thus increasing the supply of loanable funds and pushing real interest rates down, generating a larger propensity to financial bubbles. As these conditions increase risk-taking, promote irresponsible lending and make Ponzi schemes more attractive. Furthermore, according to the author, there is an excessive demand and shorter supply of safe assets, given the downgrading of sovereign debt. The danger of long term very low interest rates is aggravated by social choices (wage and price flexibility), technological developments (lower price of capital goods), rising inequality (lower propensity to consume of the privileged strata), the effect of strategies (accumulation of reserves in the central banks) but also of prudential regulations (pension funds requiring safe assets, therefore reducing their interest rates; Summers, 2014: 32 f.).

The second reason for skepticism is the structural shortage of safe assets, undermining financial stability. Caballero and Farhi quote a Barclay's measurement of the world supply of safe assets as being reduced from 37% of the world GDP in 2007 to 18% in 2011 (Caballero and Farhi, 2014: 112; also

class and institutions, while from the opposite point of view Alesina and Drazen (1991), map the "pro and anti-(liberal)reform groups."

Gourinchas and Jeanne, 2011; Blanchard et al., 2014).²⁵ Koo interprets the subprime crash as the “bursting of a debt-financed asset bubble” and projects a long balance sheet recessions, as liabilities bought with credit lost value but remain in the books, an effect aggravated by deflation. A possible solution would be an expansionary fiscal policy in order to offset private sector deleveraging (Koo, 2014), but this has been rejected, in particular given the European Union institutional dogmas. Yet, some interpret this trend as a leverage or “debt super-cycle”, a process of accumulation of debt and following bust, and not secular stagnation (Rogoff and Lo, 2015).

The difficulty of the solution can be assessed if Krugman’s solutions are listed, concentrated on the danger of a long-term liquidity trap and irrelevance of monetary policy, and therefore favoring the restoration of conditions for the success of short term management: higher inflation targets, changing the retirement age and extending the public pensions system, improving countercyclical fiscal policy, letting the financial bubbles run their course, revising regulations on ratings and fiscal policies, namely the EU Fiscal Stability Treaty (Krugman, 2014). The very enunciation highlights the difficulty of the endeavor.

If the demand side is the focus of these explanations, an alternative view on the supply side is proposed by other researchers, who note the effects on future potential growth given hysteresis, as the long recession impinges permanent impacts on potential growth. Gordon argued that technological progress returned to some historical normal, as the total factor productivity average annual growth for 1930-1980 was five times the average after that date. Although not questioning the availability of innovations, he argued that their macro impact is restricted by stagnated population, by the completeness of the mass education revolution, by raising inequality and globalization leading to factor price equalization, and by the weight of public debt. Furthermore, according to Gordon (2014), previous clusters of innovations had a more general impact boosting productivity. This was met with criticism: the proponents of the thesis of a slowing down of innovations are a “chorus of doomsayers” (Mokyr, 2014), as “stagnation is likely to be temporary”, since it is not a purely economic phenomenon (Glaeser, 2014: 73), and in any case it is attributable to lack of investment in infrastructure, education and training, something that can be corrected (Eichengreen, 2014).

The notion of stagnation also refers to an older view, scarcely if at all referred by these authors: that of Ricardo and most classical economists, on accumulation leading to a steady state. In this case, this was presented as economic and social determinism. The stagnationist authors avoid that view but, in any case, present the long term perspective as a consequence of the conjuncture, a mix of wrong economic decisions and bad structural fate. In any case, no structural explanation for the long period of slow growth and for the tensions in the accumulation process is presented, as if crises lead to difficult accumulation. Marx and a few other classical economists thought the opposite, that accumulation would lead to crises, destroying capital and reconstructing productive forces; independently, Veblen argued that the dominant social forces benefit from the structural crises and therefore fight for the control of their evolution, or that stagnation is a social strategy and the consequence of a form of accumulation. *As Time Goes By* – and events as they have turned out – favor this alternative interpretation.

²⁵ Some economists argue otherwise: Gorton et al. (2012) find no shortage of safe assets, and so does Eichengreen (2015).

4. Conclusion

In this essay, two forms of accumulation were identified as characteristics of the long phase B of the fourth Kondratiev: as investment in productive capacity, and as reproduction of fictitious capital. The second form is usually known as financialization, which is the essential pillar of the current regime of accumulation. The purchase of fictitious capital, frequently larger than that of productive capacity, generate a specific form of boom, leading to what could be called the law of devaluation of financial assets. The subprime crash was an expression of such devaluation. Yet, devaluation of fictitious capital is not enough to create the conditions for overcoming slow growth, since the reason for stagnation is the reduced expansion of surplus. The Phase B will give place to a new expansionary Phase A of a fifth long wave only when the mismatch between the techno-economic paradigm and the socio-institutional conditions is solved and profits and accumulation are reestablished at a high level.

Under the present circumstances, the socio-institutional framework for that new expansion might combine four radical conditions: liberalization of financial flows, privatization of public goods, general precarization of work, or low wages for qualified labor, and globalization of markets. Indeed, what is required for a new expansion is not a recovery of aggregate demand, which is indeed opposed to the needs of capital, but a social victory as the reestablishment of a convenient rate of profit and the social discipline accompanying it. Such social mutation is being vigorously pursued but it requires a deep change of the capital-labor relation, which was in the past designed in the developed economies to establish low wages of unskilled workers as a form of coercion (first and second long waves), whereas currently it is designed to impose precariousness of skilled workers as a form of hegemony (phase B of the fourth long wave).

As shown, it was not directly because of popular militancy, in spite of social resistance and even political recomposition, that the profit rate was not reestablished at the levels of the previous expansion. Although social movements were important, for the last two decades the popular protest in most developed countries was weaker than in any time since the 1960s, and only in the 2010s a combination of environmental activism and social protest is emerging as a major protagonist in some countries. The reason for the long structural crisis is the architecture of the economic system itself: a profound change of settings is required as far as social organization, synthesis of business interests and political figures, establishment of networks, education, selection and promotion of cadre in order to lead deregulation and financialization are concerned. These processes take decades and I have shown here some of them at work in different examples, from the US to Latin America, Asia and Europe. If this process of changes in production and distribution leads to a new regime of accumulation, under the form of financialization, which means concentration of power, it also changes the social contract that has been established after the Second World War in most developed economies, replacing it by more authoritarian forms of leadership, based on populism and, in some cases, on militarization.

Furthermore, as obvious in economic history, hegemony disputes define the international leadership. In the long fourth Phase B, the decrepitude of the previous mode of development is exhibited by the crisis of leadership, particularly as Trump promotes a trade war, China emerges as a major player, and European

Union enters a turmoil provoked by the vulnerability of the euro and Brexit, and these factors further complicate the solution for the mismatch.

None of this is engraved in destiny. Decisions and choices lead the world. For now, the result of such dominant choices is a peculiar characteristic of this lasting downturn, leading to the prevalence of the combination of debt and several mild and deep recessions with changes in the political and legal institutions, namely, for the recent years, the generalization of measures promoting inequality, implying further instability and conflict. A regime of accumulation through financialization, or rentism and extractivism, generates inherent instability. Economic perturbations and political chaos will endure or even still be aggravated, after forty years of this long Phase B of the long wave.

In *As Time Goes By*, we cite the dictum by Walter Inge, the Dean of St. Paul who, in 1229, presented his version of the Genesis as Eve telling Adam, as they were expelled from Paradise, “my dear, we live in the age of transition”. Indeed, we do. Now as always. But time does not flow linearly to a fate and this is why the fundamental things apply: the secret of the event, as always, is social choice.

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