

THE LONG RECESSION AND ECONOMIC CONSEQUENCES OF THE COVID-19 PANDEMIC

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ABSTRACT

In this article, we argue the rate of profit in combination with the movement of the real net profits determines the phase-change of the economy in its long cyclical pattern. Since WWII, the US and the world economy have experienced two such long cycles. The pandemic COVID-19 has deepened a recession that has been already underway since 2007. The growth rates in the first post-pandemic years are expected to be high; however, soon after, the economies will find themselves back to their old recessionary growth paths. The onset of a new long-cycle requires the restoration of profitability, which can be sustained only through the introduction of 'disruptive' innovations backed by suitable institutional arrangements.

Keywords: Long recession, secular stagnation, pandemic, long cycles, institutional changes, disruptive innovations.

JEL Classification: B5, D33, E1, N12, O51.

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RESUMEN

En este artículo argumentamos que la tasa de ganancia, en combinación con el movimiento de las ganancias reales netas, determina el cambio de fase en el patrón del ciclo largo de la economía. Desde la Segunda Guerra Mundial Estados Unidos y la economía mundial han experimentado dos ciclos largos. La pandemia COVID-19 ha profundizado la recesión que ha estado en curso desde 2007. En los primeros años posteriores a la pandemia se espera que las tasas de crecimiento sean altas; sin embargo, inmediatamente después las economías retornarán a sus anteriores trayectorias de crecimiento recesivas. El inicio de un nuevo ciclo largo requiere de la restauración de la tasa de ganancia, que sólo puede sostenerse a través de la introducción de innovaciones “disruptivas” apoyadas por arreglos institucionales adecuados.

Palabras clave: recesión larga, estancamiento secular, pandemia, ciclos largos, cambios institucionales, innovaciones disruptivas.

Clasificación JEL: B5, D33, E1, N12, O51.

1. INTRODUCTION

There is enough evidence that the US and the World economies are from 2007 onwards in a lasting recessionary state. Such a situation has also received the approval of prominent economists, who have resurrected the almost forgotten Alvin Hansen’s secular stagnation (ss) thesis (Summers, 2014; Krugman, 2014; Gordon, 2015, among a host of others). Unlike the ss thesis, in our discussion of the US and by extent the World economy, we explain the slowdown in economic activity through the falling rate of profit, which in the long run leads to the stagnating mass of real net profits and, in so doing, discourages net investment and increases unemployment. Furthermore, we argue that there is neither perpetual prosperity nor permanent stagnation; underneath the currently stagnation phenomena, there are forces at work acting in restoring profitability, which coupled with suitable new institutional arrangements, may create a new economic environment paving the way for the onset of a new long-cycle.

Since the industrial revolution of the last quarter of the eighteenth century, the above long cycles scenarios have been repeated five times; however, it is questionable whether the same dynamics are already at work and are strong enough to give rise to a sixth repeat¹. Meanwhile, the pandemic of 2020-2022 has deepened a prolonged recession already underway and, at the same time, accelerated the rate of introduction of new innovations impacting employment in ways altogether different from those in the past, compelling the creation of new institutions to corroborate these changes. The question is to what extent, if any, these innovations motivated by the pandemic have the dynamics of the old ones and they will restore and sustain profitability at high levels and by doing so provide the fuel for the upturn of a sixth long cycle.

The remainder of the article is structured as follows: Section 2 introduces the long cycles and the associated phenomena. Section 3 explains the currently downward phase because of the movement in profitability. Section 4 brings relevant statistical evidence based on the estimation of two logistic curves using quarterly data on the US corporate real net profits spanning the period 1946:1-2021:3. Section 5 discusses the effects of the pandemic and its impact on the cyclical movement of the economy. Section 6 summarizes and makes some concluding remarks about future research efforts.

2. LONG CYCLES AND THE CURRENT STATE OF THE US ECONOMY

The idea of the long cyclical movement of the economy is old and can be found mainly in the works of Kondratiev (1935, 1998). Schumpeter (1942) and the approach based on the social structures of accumulation (Gordon, Weisskopf and Bowles, 1987) point to different explanations of the long cycles. The Schumpeterian interpretation is couched on the ‘swarms of innovations’, which lead to the rising stage of the long cycle while the completion of their diffusion brings the economy to its stag-

¹ The periodization of long cycles is as follows: First long cycle: 1790s to 1840s (up: 1790-1815; down: 1815-1845). Second long cycle: 1840s to 1890s (up: 1845-1873; down: 1873-1896). Third long cycle: 1890s to 1940s (up: 1896-1920s; down: 1920s-1940). Fourth long cycle: 1940s to 1980s (up: 1940-1965; down: 1966-1982). Fifth long cycle: 1980s to the present (up: 1982-2007; down: 2007-present) [Tsoulfidis and Papageorgiou, 2019].

nating phase. The proponents of the social structure of accumulation argue that the introduction of suitable institutional framework is what propels long term growth but, past a critical point, the same institutions become a burden that slows down the growth rate of the economy necessitating a new set of growth promoting institutions.

In this article, we argue that the innovations and the required institutional setup, along with a host of other phenomena (volume of international trade, sovereign defaults, social unrests, and international conflicts, among others) are the stylized facts of the evolution of the profit rate, an explanation more consistent with Kondratiev, as this can be derived from his response to his critics (Kondratiev, 1998). Kondratiev, although not a Marxist, was more in determining endogenously the movement of long cycles through the interest (profit) rate and opposed to the idea of exogenously determined shocks such as innovations, wars, new markets, sources of raw materials and the like, whose likelihood of occurrence or discovery is derived from the inner dynamics of the system. In the same spirit, even the COVID-19 pandemic would not be considered an external but rather an internally generated shock caused by environmental and economic changes driven by the restructuring of agriculture, urbanization, globalization, and neoliberal economic policies favoring unregulated markets.

Naturally, this explanation is consistent with Marx's (1894) view of the law of the tendentially falling rate of profit, albeit he did not live to experience not even the end of the third long cycle. If the rate of profit is in its long-run downward direction, the likelihood of default, on average, is higher, much higher than the risk of innovation. This is another way to say the prospect of default intensifies competition and expedites the introduction of innovations. The long-lasting downturns in economic activity and the associated with-it falling rate of profit constitute the ideal environment for the flourishing of groundbreaking innovations (such as those the steam engine, railroads, electricity, jet planes, the internet, and the like introduced in the depressionary stage of every long cycle). Epoch-making innovations in order to be operative need to be accompanied by suitable major institutional changes (such as those during the New Deal in the 1930s and the dismantling of various institutions of the so-called welfare state replacing them by others, during neoliberalism in the 1980s).

In the current depressionary stage, we are witnessing certainly falling profitability and gradually we see more and more the appearance of radical innovations and the urging need for associated institutional changes. Despite similarities of the current long cycle with those of the past, we must note that each particular phase possesses its own unique features. For example, the 1946-1963 rising phase of the fourth long cycle has been characterized as the 'golden age of accumulation' because of the high growth rates while in the following recessionary period until 1982, the unemployment rates were low at the expense of the inflation rate, which was unusually high for a recessionary phase of a long cycle. The 1983-2007 rising phase of the fifth long cycle has been characterized as the 'great moderation' because of its low inflation rates, low interest rates, and shallow business cycles. The same does not hold for the recessionary post-2007 phase which is inflicted by rising income inequalities and polarization, some bubbles, and two severe downturns in the years 2009 and 2020. The downturn caused by the pandemic is the worst in the post-WWII period and is estimated for the United States of America (USA) at -3.5% ; to get an idea of the size of the downturn in 2020 it is worth mentioning that the downturn in 1982 was only at -1.82% while that in 2009 was -2.9% . In the South European countries, the growth rate in 2020 is estimated at -9.3% while the European Union's average is about -6.1% ; in China, the growth rate in 2020 is positive at 2.3% , which is about four times lower than its average of the recent decade(s) [see also Figure 1 below].

There is no doubt that the pandemic COVID-19 will leave its indelible mark on the economic history of this century, as this can be ascertained by comparing its growth reduction effects with those of 1918 influenza, during which the USA growth rate dropped from 8.6% to 0.8% in 1919. Nevertheless, such a slowdown cannot be compared to the drop in 1922 estimated at -2.3% , let alone the year 1932 when the growth rate of the real gross Domestic Product (GDP) dropped -13.8% ². Hence, it is important to emphasize that the 1918-1919 influenza inflicted the USA and the World was in the upturn of their long cycle while the magni-

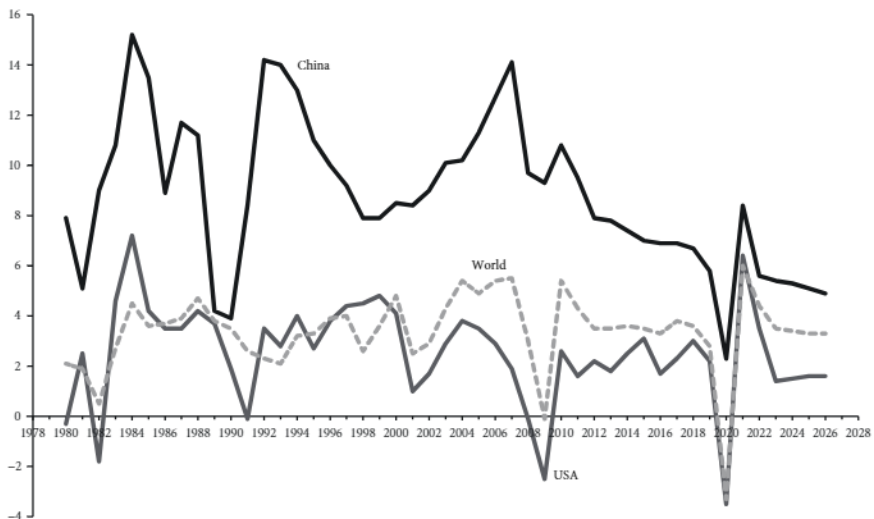
² The real GDP data estimates of growth rates for the years 1918 and 1919 are from the Economic History database <https://eh.net/databases> while the more recent ones are reported in the IMF's database <www.imf.org/external/datamapper> that starts from 1980.

tude of its impact on the growth rate confirms a stylized fact of the long cycles. That is, when the economies are in their upturn, the frequency of recessions is lower and their depth shallower; the exact opposite is observed in the downturn of the long cycle, as we are experiencing with the current pandemic.

Figure 1 below displays the growth rates of the real GDP of the USA, China, and the World economy. The data come from the International Monetary Fund's (IMF) publication (www.imf.org/external/datamapper) spanning the period of the fifth long cycle and give rise to a visual understanding of the evolution in economic growth and the COVID-19 effect. We observe that the rising phase of the fifth long cycle (1983-2007) was marked by shallow business cycles. The same does not hold for the post-2007 phase, which was punctuated by two severe downturns, namely the 2008-2009 and the one induced by the pandemic in 2020-2021.

In the same Figure 1, we also observe that from 2021 onwards, the projection by the IMF is that pretty much the economies will return to the low stagnating growth rates of the post-2007 period. It is interesting to note that the IMF's time-series data, coincidentally perhaps, spans the period of a nearly long cycle, which, as we argue below, is expected to be completed around the same year.

Figure 1. Growth rates USA, China and World Economy, 1980-2026



The post-2007 period anemic growth rates and the two severe downturns have resurrected the old notion of ss whose current version emphasizes the gradual but substantial shift from a younger to an *older population age structure*, whose high saving propensity is responsible for the low investment. Other variants of the ss thesis single out the rising income inequalities (Krugman, 2014) and the diminishing returns to new innovations (Gordon, 2015)³.

3. RATE OF PROFIT, REAL NET PROFITS AND STAGNATING INVESTMENT

The main argument of the article is that long cycles are induced by the long-run movement in the profit rate and the mass of real net profits. All start with the nature of capital which is oriented in the extraction of maximum possible profit and in competition with labor and other capitals. This two-front competition leads to the mechanization and the automation of the production process and to a rising capital-output ratio or, what is the same, a falling maximum rate of profit. The latter compresses the economy-wide profit rate to an even sharper fall, as we know from the pertinent literature (Shaikh, 1992, 2016; Tsoulfidis and Tsaliki, 2019)⁴. Starting with the profit rate, r , defined as:

$$r = \frac{\Pi}{K} = \frac{\text{Profits}}{\text{Invested capital}}$$

and by taking growth rates, indicated by a hat over the letter, we get:

$$\hat{\Pi} = \hat{\pi} + \hat{K}$$

So long as the right-hand side of the above equation remains positive, the mass of real net profits, Π , is growing, and the economy is moving in

³ Gordon's explanation echoes a similar but broader view according to which all major scientific discoveries have been already made, and from now on only minor improvements of the old ones are left at our disposal (Horgan, 1996).

⁴ In Marx's *Capital* III Chapter 15 we find a detailed discussion of the law of the falling tendency of the profit rate and its effects on the movement of the mass of real profit (Marx, 1894).

its upward stage. If the rate of profit is in its downward direction, and the rate of its fall is less than that of the growth rate of the invested capital, K , the mass of real net profits will be still rising. Under these conditions, the economy expands at a healthy growth rate, as output, demand, and employment are all on their upturn, giving rise to an aura of optimism that permeates society. For example, in the 1990s during the upturn of the long cycle, opinion makers and economists used to assert that the modern economy is not affected any more by severe recessions, as in the past. The cliché of the period was that our ‘new economy’ is qualitatively different from those in the past, because of the rapid spread of information and its efficient utilization by firms which, on average, make the right decisions, thereby rendering the economy depressions-proof. This view was almost “forgotten” in the mid-2000s with the burst of the real estate and stock market bubbles. Quite similar was the optimism that prevailed in the 1960s when, once again, the economy was thought to be depressions-proof because of the prevailed ‘mixed economy’ in which state intervention through the appropriate mix of fiscal and monetary policies could maintain the economy in its stable and healthy growth path. But during the stagflation crisis in the 1970s, these views ceased to be popular. We need not refer to the famous “roaring twenties” during which orthodox economists were describing the US economy as fundamentally healthy and growing vigorously without suffering from the plagues of the past. It is well-known that nine days before the collapse of the stock market in 1929, there were views claiming that the stock market is on a “permanently high plateau”⁵.

As the economy is in its upward phase, the rising investment and the built-up of capital stock leads to a rising capital-output ratio, which eventually gives rise to a falling rate of profit followed by a positive albeit falling growth rate. The positive but falling growth rate and the negative growth of the profit rate reach to a critical point neutralizing each other out, leading to the stagnating mass of real net profits. Consequently, past this tipping point of real net profits, net investment is withheld and together with the rising unemployment mark the onset of the crisis. But why is net investment withheld? The answer relates to

⁵ Irving Fisher's comments to the Purchasing Agents Association on October 15, 1929.

the stagnating mass of real net profits. The idea is that although every particular business may not recognize the economy's stagnating mass of real net profits, businesses, on average, become aware of this outcome. At stagnating or even declining mass of real net profits, the additional investment ends up, at best, and always on average, to an unchanged or rather stagnating real net profits picture. Under these circumstances, the motivation to invest evaporates. The slowdown in investment induces financial institutions to grant new loans to recover the old ones. However, new loans require the expansion of economic activity, which may become possible through lower real interest rates and the tempering of lending standards. Meanwhile, firms in the face of falling interest rates and profitability, would rather buy back shares, distribute dividends, or invest in titles and not invest in real capital. As a consequence, bubbles are being created and at the same time, the long-lasting recessionary situation creates a suitable environment to foster new innovations. The idea is that falling profitability, in the long run, reaches the critical point where the risk of default outweighs the risk of innovation. The so-called 'disruptive innovations' (Perez, 2002), as it has been repeatedly argued, are introduced towards the end of the recessionary phase of the long cycle (Tsoulfidis and Papageorgiou, 2019 and the literature cited there).

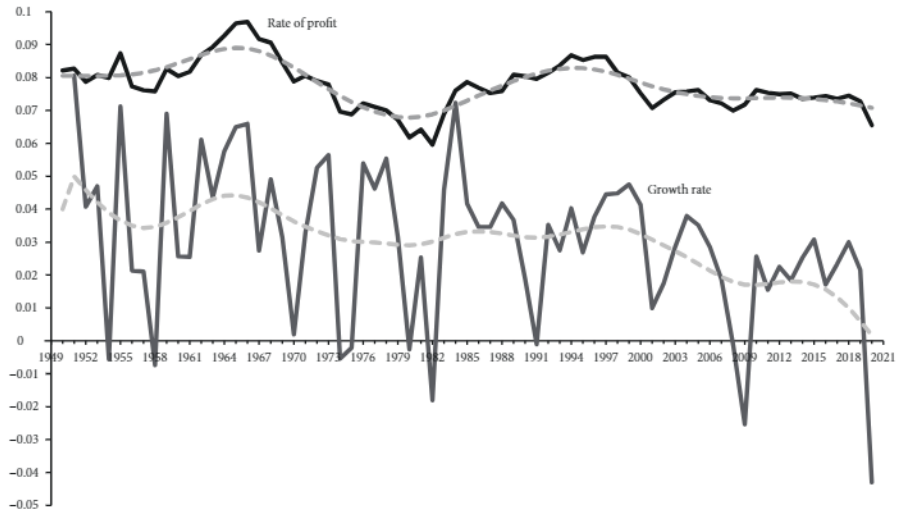
Figure 2 below confirms the tight relationship between the growth rate of the economy and the rate of profit in the data of the US economy for the postwar period. The correlation coefficient of their trends is 68.9%.

The gap or the ratio between the two variables (growth rate and rate of profit) has received various, in our view complementary, interpretations. The gap may be used as an explanation of the upturn or downturn phases of long cycles (Shaikh, 1992; Tsoulfidis and Tsaliki, 2019) as well as an indicator of the inflationary pressures (Shaikh, 2016), the rising inequalities in income and wealth distribution (Piketty, 2014) and the growth of unproductive expenditures in the economy (Tsoulfidis, Tsimis and Paitaridis, 2019).

In short, the burst of the bubbles and the new innovations separate and combined with the rising unemployment and falling wages over long periods make possible the recovery of profitability and form the conditions for the onset of a new long-cycle. The innovative investment and the associated 'creative destruction' of the capital stock eventually set the stage for the upswing phase of a new long-cycle. The inevitable

Figure 2. Rate of profit and growth rate, USA, 1950-2020

(www.ggdc.net/pwt)⁶



devaluation of capital and the subsequent concentration and centralization of capital along with falling wages restore the economy-wide profit rate and profitability in general. The question is whether this restoration of profitability is going to last to sustain a full long cycle. The answer to this question has to do with the character of the new innovations and the extent to which their destructive effects are ‘creative’ enough to devalue sufficiently the old capital stock compelling the creation of new institutions to corroborate the changes, which would have taken place anyway. Thus, both the Schumpeterian (1942) “gale of innovations” and the epoch-making institutions of the ‘social structures of accumulation’ approach to long cycles (Gordon, Weisskopf and Bowles, 1987; Kotz and Basu, 2019, and the literature cited there) are both derived from the evolution of the profit rate. In short, they are the outcomes of the movements in the rate of profit and not the cause of the long cycle.

⁶ The time-series data is from Penn (Feenstra, Inklaar and Timmer, 2015) and span the period 1950-2019 (www.ggdc.net/pwt). The growth rate for the year 2020 is from the IMF’s database. The rate of profit only for the year 2020 is from information available at the Annual macro-economic database (AMECO, <<https://www.ec.europa.eu>>).

One may argue why would a falling rate of profit lead to the welfare state of the 1930s and neoliberalism in the 1980s onwards? The answer is that the falling rate of profit always stands for the independent variable and the welfare state is the dependent one. Many other reasons gave rise to the so-called welfare state in the 1930s. Among these are the rising demands of workers for protection from unemployment provided that the centrally planned economies, in those years, were appealing to the labor movement in the West because of what was a widespread belief of vigorous economic growth and zero unemployment. The lasting economic crisis in the thirties forced orthodox economists to acknowledge the presence of many market failures, among which was the provision for sufficient effective demand. Consequently, the corrective role of the government included the provision of welfare functions for workers, regulation of businesses, especially those in the financial sector, and increasing its expenditures to create enough effective demand. It is important to stress that the share of government expenditures in GDP in the 1930s was far too low, at about 10%. From the point of view of big capital, and its financial fraction, deregulation has been a crucial institutional change because it led to the low-interest rates, coupled with depressed real wages restored the rate of profit in an upward trend up until 1997. The year of the onset of the falling rate of profit, which a decade later caused the current economic crisis. The US rate of profit and that of the other Organization for Economic Co-operation and Development (OECD) countries were well below the post-WWII “golden stage of accumulation.” In both periods, the movement of the rate of profit always and everywhere is the independent variable giving rise to crises, during which the conditions for the change in the institutional setup (or SSA) are ripe. The new institutions and the gale of disruptive innovations must be suitable to the specificities of each period.

It is important to note that Kondratiev (1935, 1998), although not a Marxist, and clear enough about the long-cycle mechanism, paid particular attention to the rate of interest but not, necessarily, explicitly in its relation to the rate of profit⁷. More specifically, the difference between

⁷ In the early 1920s Kondratiev declared “We do not consider ourselves to be Marxists, but we consider Marx’s method as very valuable and scientifically productive” (cited in Mustafin, 2018).

the rate of profit and the interest rate; that is, Marx's (1894) notion of the "rate of profit of enterprise." Nevertheless, his position was in favor of an endogenously generated long cycle regulated by profitability and not by exogenous factors such as wars, the discovery of new gold mines, disruptive innovations, new institutions, and the like. According to Kondratiev, all the above are the "symptoms" of the long cycles governed by the internal dynamics of capitalism, namely profitability. This becomes particularly pronounced in the motivation for the discovery of new gold mines, driven by the rising price of gold and falling wholesale prices, which increased the profit margins, in this particular industry, rendering compelling the discovery of new gold mines and the application of new techniques for its extraction. As for the epoch-making innovations, Kondratiev (1935, p. 537) pointed out that they are introduced at the beginning of the new long-cycle and at the point where the profits associated with them match those of the old techniques, which gradually are replaced by the new ones. This description is no different from the stagnating mass of real net profits described by Marx, and we ascertained it with the detailed quarterly corporate net real profits data of the US economy for the fourth and the fifth (still in progress) long cycles.

4. REAL PROFITS AND LONG CYCLES

The relation between the rate of profit and the growth rate of the US economy is visually confirmed in Figure 2. All the results of the empirical analysis provide strong statistical support for the classical political economy hypothesis and argument for the centrality of the rate of profit in determining the economy's growth rate. Having established the connection between the economy's growth rate to the economy-wide average rate of profit, we now look at the hypothesis that the mass of real net profits of the postwar US economy may follow an S-shaped or logistic pattern. To confirm this, we use quarterly data on corporate real profits after taxes, capital consumption allowances and inventory valuation adjustments of the total economy⁸. The quarterly data, spanning the

⁸ The quarterly data of corporate profits are from the Fred (<https://fred.stlouisfed.org/>) and were accessed on January 21, 2022. These data are deflated by the gross private

period from 1947:1 until 1982:4 cover the fourth long cycle while the data from 1983:1 to 2021:3 (to a certain extent) cover the fifth long cycle. We are testing the following form of the logistic regression:

$$P(t) = L + \frac{U - L}{1 + e^{-(a \cdot t + b)}}$$

Where $P(t)$ stands for the dependent variable, that is corporate profits, t is the time variable, L is the lower asymptote of the non-linear regression, U is the upper asymptote of the logistic curve, a is the growth rate and b is the parameter indicating the precise location of the curve.

The estimated parameters of the two logistic curves are all economically meaningful, as this can be judged by their sign as well as size and they are statistically significant (the absolute values of t -ratios are in parentheses). In other words, all the above features of our estimations paint very accurate descriptions of a well-behaved S-shaped pattern in the movement of real net profits of the US economy. The R-square is high enough given the statistically strict requirements of the S-shaped curves.

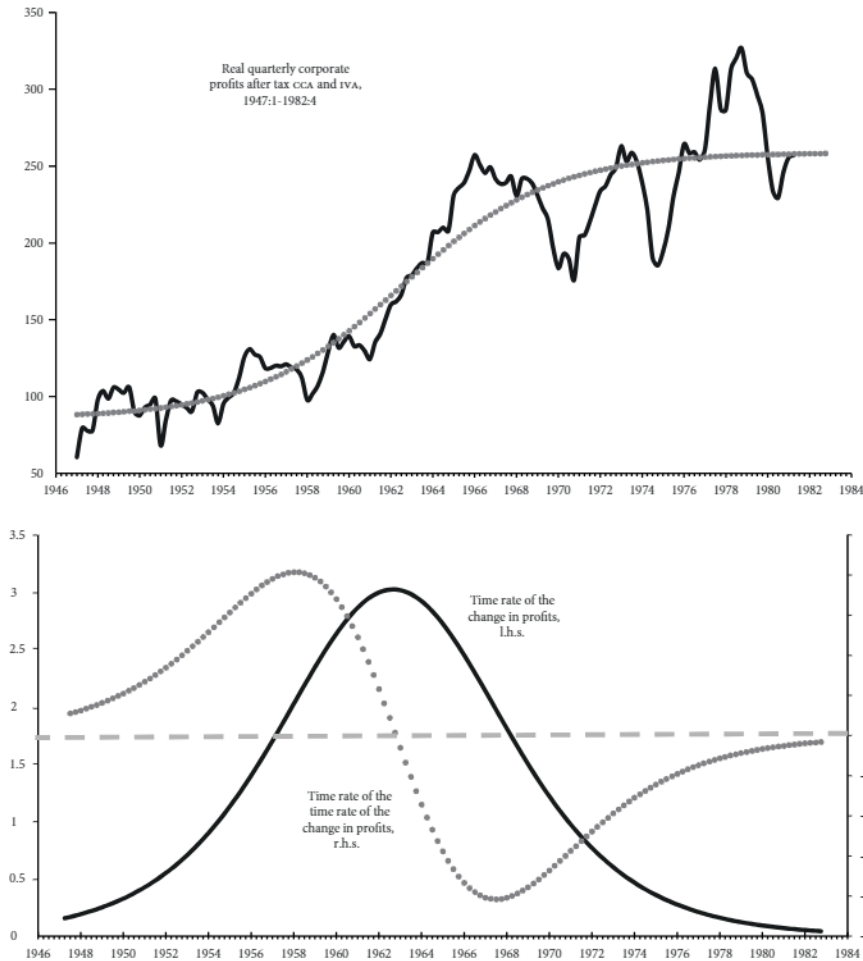
In Figure 3, we show the estimated logistic (fitted) curve together with the actual curve formed by the quarterly data of real corporate profits of the USA spanning the period 1947:1 until 1982:3 shown in the upper

Table 1. Parameter values of the two logistic curves

Long cycles	L Lower asymptote	U Upper asymptote	a	b	$t_m = \left(-\frac{b}{a}, \frac{U+L}{2} \right)$ Inflection point	R^2
1947:1-1982	84.42 (11.6)	261.07 (47.5)	0.066 (6.75)	-4.16 (6.31)	1963	87.6%
1983:1-2021:3	216.19 (5.19)	2,271.37 (19.58)	-0.032 (10.2)	7.85 (11.28)	2007	96.7%

domestic fixed nonresidential investment deflator index (2012 = 100) also available from the same source.

Figure 3. Mass of real net corporate profits, USA, 1947:1-1982:4



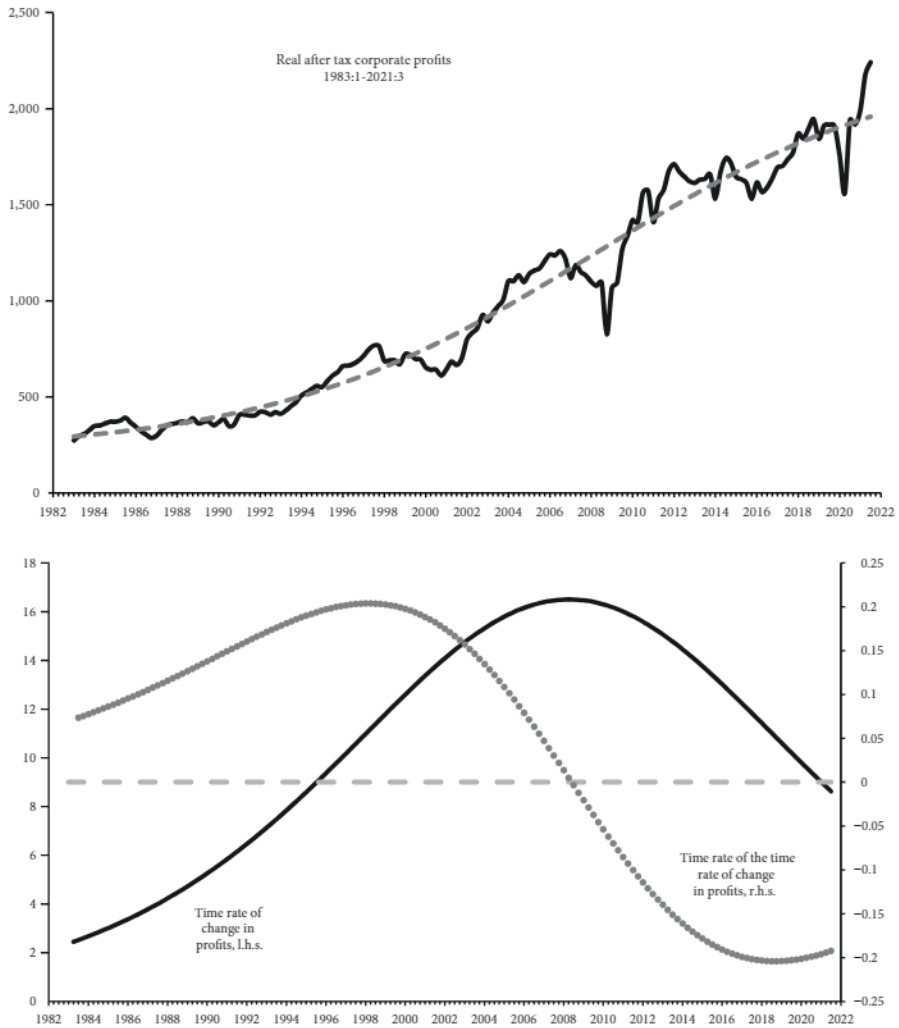
panel, along with the curves corresponding to the first and second derivatives of the fitted function shown in the lower panel. The inflection point is derived visually (lower panel) through the time rate of change of the logistic curve (or estimated trend). Mathematically speaking, the first derivative of the function, describing the dynamics of the logistic curve, display the upper and lower asymptotes as well as the maximum point while with the second derivative we determine the turning point of the logistic curve, which occurs in the middle of its S-shaped trajectory.

The mathematical analysis, but also the visual inspection of Figure 3, shows that the inflection point occurs at $t_m = -(-4.357/0.07) = 62.19$ quarters or approximately 16 years, which added to 1947 we get approximately the year 1963 or more precisely the third quarter of 1962. At this point, the first derivative of the logistic curve is equal to zero while the second derivative from positive becomes negative. By taking the average of the two asymptotes (U and L), we get the profits corresponding to the year 1963:3 which is $(U + L)/2 = (86.14 + 258.89)/2 = 172.51$ billion USD in constant 2012 prices. At the point that the second derivative is zero, the first derivative is maximized while the logistic curve attains its inflection point. From Figure 3, we observe that the US economy already from early 1960s enters into the downturn of the fourth long-cycle which lasted up until the early to mid-1980s. Judging from the shapes of the moves of the first and second derivatives, we can say that the cycle was completed already in 1982:4. More specifically, the bell-shaped curve of the first derivative (Figure 3, lower panel) indicates that the logistic growth has completed its full trajectory signifying the end of the fourth cycle and the beginning of the fifth on which our attention now turns.

The quarterly data of corporate real net profits spanning the period 1983:1-2021:3 cover the fifth long cycle which is underway towards its end. Consequently, the non-linear regression results for the fifth long cycle, presented in the lower part of Table 1, are not definitive as those of the fourth long cycle. Figure 4 displays a logistic fit of the quarterly time-series data of real net corporate profits for the period 1983:1-2021:3. Similar to the fourth long cycle fashion, we portray the same figure in the two panels.

From the panel of graphs in Figure 4, we observe the fifth long cycle is still underway towards its completion; the approximate estimation of its inflection point gives us a clue of the years remaining to the saturation point. More specifically, judging by the lower panel, we expect the stagnation in profits to continue towards the end of the decade. Notwithstanding, the estimated parameters do not show the exact year of the inflection point. However, judging our estimates of the upper and lower limits we have $(216.19 + 22,271.37)/2 = 1,243.78$ billion USD which is attained in the year 2007 or the beginning of 2008. The same answer we got from the lower panel of Figure 4, we find that the first derivative is maximized in the year 2008:1; that is, in approximately 25 years since

Figure 4. Mass of real net corporate profits, USA, 1983:1-2021:3



1983 while the attainment of the saturation point will require approximately the same number of years. The first-time derivative of real net profits in the lower panel is not bell-shaped, indicating the cycle is not yet fully completed. The second derivative of real net profits attains its critical point (equal to zero) in the year 2008:1, and the negative part of the curve shows there is still time to approximate the zero bound. Our

findings based on the extrapolation of the logistic curves suggest that the completion of the fifth cycle is anticipated sometime around 2028.

In recent years there is a lot of discussion about the growing financialization of the economies which may contaminate the results of the analysis. The idea is that the financial corporations are by and large engaged in non-production activities and so they may have some bearing on the results of the testing. Our findings with the real nonfinancial domestic corporate profits adjusted for depreciation and inventory valuation adjustment (available at the Fred database <<https://fred.stlouisfed.org/series/A463RC1Q027SBEA>>) gave quite similar if not more emphatic results, which we report in our Appendix.

5. ECONOMIC CONSEQUENCES OF THE PANDEMIC

The pandemic COVID-19 will be remembered not only for the worst postwar fall in economic activity but also for leveling to the surface pre-existing economic problems and social issues. As is well-known, in the ideology and practice of neoliberalism, the welfare state is thought to be a burden, and its dismantling a precondition for vigorous economic growth. More specifically, the depressionary state of the economy since 2007 and its worsening due to the pandemic revealed weaknesses, such as the inadequacy of social safety nets, lack of trust in institutions, racial, regional, ethnic, and other social conflicts. The neoliberal ideas and economic policies in the face of the pandemic were quickly abandoned, and ironically, even the otherwise neoliberal parties and governments suggested or even implemented expansionary fiscal and monetary policies. The motto “we are all Keynesians now” not only returned but got even lauder, and the rising deficits and debts are considered more like a virtue rather than a vice. The low-interest rates guarantee the servicing of the rising debts, and the expectation is that as soon as the economies find themselves back on their vigorous growth path, the public debt will cease to be a problem.

From the political economy perspective, the pandemic became a catalyst and, at the same time, an accelerator of changes in the workplace and social relations in general; it has contributed to the spread of innovations that otherwise would have taken considerably longer. The innovations that spread quite rapidly like Zoom, Blackboard collaborate,

and Microsoft teams, frivolous as they appear, at first sight, meant not only to stay but spread quite rapidly. Consequently, marked changes take place in the labor process, the location and manner in which transactions, as well as communications, are carried out. Education has been equally affected, and the distant-learning alternative will remain and, by expanding its applications, will increase its popularity as time goes by. The entertainment industry and virtually all aspects of social relations and contacts have already been affected, and we are just in the beginning. It is important to reiterate that these particular innovations are mainly related to telecommunications and cause the following profound effects that make them attractive to businesses:

- Reduce production costs through the devaluation of capital (fewer building facilities and less space requirements generally reduce operating costs).
- Wages are practically reduced, as the working time at home and intensity of work increases and the lack of comprehensive laws and related institutions may lead to overt workers exploitation.
- Workers may concede to wage reductions as they no longer have workplace-related expenses.

The “choice” of telecommunication-related innovations, when applicable, is forced upon businesses due to cost reduction and so, not only will stay, but further develop and spread accelerating the digital metamorphosis of society. The application of artificial intelligence, machine learning, robotics, and industrial automation find wide applications and they are supposed to be the innovations that will lead us to what many consider as the popular nowadays ‘fourth industrial revolution’⁹. However, these innovations appear as more destroying rather than creating new stable and well paid jobs. Consequently, income inequalities are expected to increase, either because these innovations will place many businesses out of the market increasing unemployment or simply because

⁹ Proponents of the ‘fourth industrial revolution’ in their periodization find an industrial revolution approximately every century starting from the eighteenth century towards the present (Schwab, 2017).

these innovations do not create more jobs than those they destroy. This is particularly true in low-skills employment which can be more easily replaced by automation. Naturally, unemployment will be on the rise, especially in the low skills workers, worsening inequalities in income distribution, the main cause, according to the proponents of the ss thesis, of the lasting stagnating economy. The income distribution data of the USA and, in general, of major economies show rising income disparities especially after 2007¹⁰.

In the face of these prospects, there are concerns and discussions about counterbalancing the negative consequences to employment of the specific innovations through the introduction of the universal basic income (UBI), a highly controversial measure, variants of which have been proposed, at times, by both conservative and radical economists. Those against the UBI argue that this might be the policy measure through which the dissolution of the welfare state will take place, at least as we know it. Furthermore, the UBI is expected to bring a confrontation between the insiders (those in good paying jobs) and the outsiders. Consequently, polarization of society (dual-class societies) is heightened and essentially set the laboring class under the control of big businesses. Nevertheless, the UBI appears to be effective in the case of extreme poverty, but it may lead to widening inequalities between social classes.

Unlike the ss thesis, the same phenomena are precisely those expected from the falling profitability which, past a point, leads to rising default rates, increased concentration and centralization of capital and, inevitably, rising unemployment rates, provided that they are appropriately measured (Komlos, 2021). The idea is that not all firms can cope with the new requirements. The least competitive firms will either be priced out of the markets (by their more efficient competitors employing capital and labor-saving technologies) or become the vulnerable targets for takeovers, which are currently on the rise. Of course, there are firms, in the non-contact intensive industries, like pharmaceuticals, couriers, and those on the internet, which go through a very lucrative period. These industries are favored by teleworking and thrived under pandem-

¹⁰ The studies by Piketty (2014) and Acemoglu and Restrepo (2017) point to the same direction.

ic conditions. In sharp contrast, the contact-intensive industries (*i.e.*, airlines, tourism, arts, and entertainment but also private universities, and many manufacturing firms) have suffered an unprecedented blow that will place many of them out of the market, unless there is generous government aid. Finally, firms in retailing industry, by reorganizing and utilizing online platforms, struggle to respond to the ever-changing challenges in markets in this new emerging era.

Naturally, there is reorganization everywhere, and soon we will find ourselves in a transformed society and economy, which if left to their own devices, they will give rise to the following:

- Widening of inequalities at both national and regional level.
- Spread of capital-using labor-saving technologies.
- Increased unemployment and underemployment.
- Impoverishment of large sections of the population.

Because of these changes, we are witnessing a rapid increase in both private (household and business) and public debt. Rising public debt is of great concern not only to the “usual suspects” (Argentina, Greece, Japan, among many others). In recent decades, the list has expanded to include “above suspicion” countries, such as the USA, whose debt is currently around 130% of GDP. A percentage well above the thresholds of 60% of the European Monetary Union (EMU), 77% of the World Bank, 90% suggested by Reinhart and Rogoff (2009), and lately, the discussions within the European Union (EU) recommend 100% as the preferred upper public debt limit. Experience has taught us that these thresholds carry a lot of subjectivity, let alone the specific objectives they may end up servicing.

The projections in the years to come are, in general, optimistic, and they are based on the spread of innovations, which will be accelerated by government intervention¹¹. This scenario depends on the effective utilization of emergency measures taken by the US government and

¹¹ The article was written before the War in Ukraine, which is expected, other things equal, to accelerate the introduction of innovations especially those of green energy. The main concern remains and that is the terrible loss of life and human suffering.

the developments in the EU's Recovery and Resilience Fund and other countries. In addition,

- There is a discussion for a possible “hair cut” of debt obligations, especially those created during the pandemic, and there are also discussions about various public debt settlements.
- It is now more and more recognized that there can be no national solution and the *de facto* international cooperation will be sought from a perspective of smoothing out inequalities and daring debt solutions (be it a “hair-cut” or other settlements).

Certainly, the pandemic revealed the limits of the market in general and in particular the private sector to meet the demands of major challenges. However, as we argued, neither the USA nor any other of the major economies displayed rising vigorously growth rates before the pandemic, and nothing so far suggests that the long-term global recession is over. The USA and the world economy are expected to recover to their pre-pandemic anemic growth rates. The current innovations (in our view, the last of the Internet era), although they cause many changes in society, nevertheless, do not promise anything altogether different. However, they have the potential to act as catalysts for the emergence of new so-called ‘disruptive innovations’ that will give rise to an era like the internet in the 1980s, the electricity and railroads in the nineteenth century, and steam-engine in the industrial revolution. Such a prospect can only emerge through public funding of basic research and international cooperation; only then there will be the foundations and necessary conditions for a rising phase of a sixth long cycle. Conditions that are hard to be fulfilled at the present or near future times.

6. SUMMARY AND CONCLUDING REMARKS

The world economy since 2008 is in the downturn phase of the fifth long cycle. Our projection based on real corporate net profits of the US economy is that the stagnation will continue after the pandemic, despite the expected rising profitability, which cannot last for long unless major groundbreaking innovations signify the onset of the sixth long cycle. Hence, the post-COVID-19 economy may not be all that different from

its previous settings. The employment prospects in the post-pandemic period are not good enough. The reason is that the new technologies, namely, Artificial Intelligence, Machine Learning, Robotics, and Industrial Automation, admittedly eliminate more (especially unskilled) jobs than those they create, at least in the short run. These new technologies increase productivity, reduce costs, and increase profits but cause unemployment. Under these circumstances and with these new technologies, if the economy is left to its own devices, the future of work will be gloomy. This is the reason why governments intervene, at both national level and in cooperation with international organizations to create the institutional panoply to secure employment and somehow guarantee enough income for a descent leaving. The current emergency financial assistance programs can be thought of as a first-rate testing procedure for the future application of the much-discussed controversial UBI.

During the current pandemic, it is generally acknowledged that the private sector and the market, both so much praised during the decades of neoliberalism, have been more part of the problem rather than its solution. By contrast, the suppressed public sector, surprisingly enough, has contributed a great deal by providing answers to urgent economic and social problems. For example, progress in vaccination and medication was the result of public funding and cooperation among international institutions, universities, and research centers across the globe. Finally, the pandemic has shown that the public sector is crucial in tackling critical issues, starting from public health, moving to the environment, strengthening basic research, and confronting other vital issues like national and regional disparities.

From the above discussion, it follows that the fundamentals of the US as well as other OECD economies in the post-pandemic years stand approximately the same. It will, therefore, be of no surprise for the economies on average to return to their post-2007 anemic growth rates. The moderate increase in the rate of profit and the real net profits are not enough to encourage net investment and initiate the onset of the sixth long cycle. The governments' expansionary policies (in the USA and elsewhere) have reduced the negative effects of the pandemic on employment and, at the same time, have provided directions to firms and financial institutions toward specified investment activities. By considering the experience of COVID-19 —the result of increasing

commodification and environmental destruction— governments and international organizations should apply particular caution to the kind of activities they encourage with their actions or inertias. ◀

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APPENDIX

Logistic curves and parameter values for corporate profits with inventory valuation and capital consumption adjustments: Domestic nonfinancial industries

Table A1. Parameter values of the two logistic curves

Long cycles	<i>L</i> Lower asymptote	<i>U</i> Upper asymptote	<i>a</i>	<i>b</i>	$t_m = \left(-\frac{b}{a}, \frac{U+L}{2} \right)$ Inflection point	R ²
1947:1-1982	158.53 (37.25)	280.55 (77.12)	0.292 (3.22)	-18.39 (6.31)	1963	78.9%
1983:1-2021:3	222.75 (3.20)	1616.4 (8.88)	-0.028 (4.61)	6.76 (5.21)	2007	90.2%

Figure A1. Mass of real net corporate profits, USA, 1947:1-1982:40 for domestic non-financial corporations

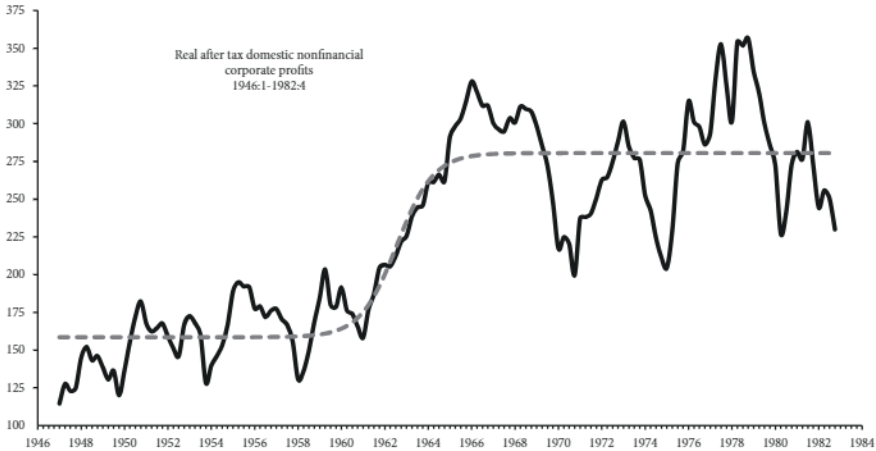


Figure A1. Mass of real net corporate profits, USA, 1947:1-1982:40 for domestic non-financial corporations (continued...)

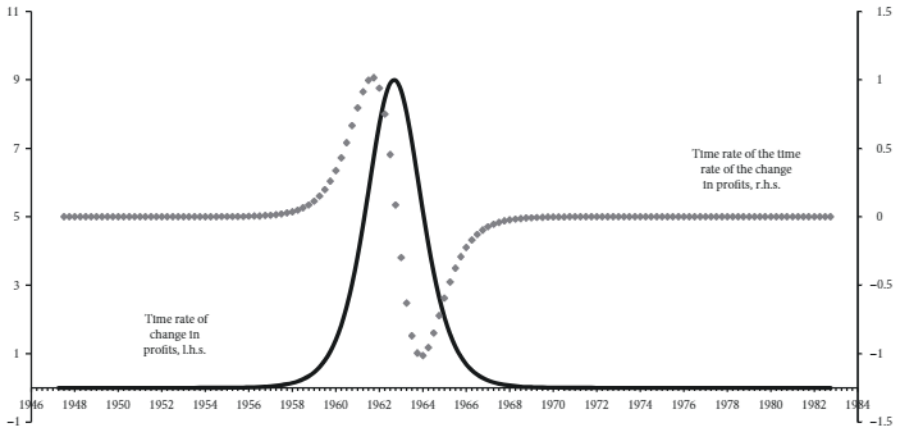


Figure A2. Mass of real net corporate profits, USA, 1983:1-2021:3 for domestic non-financial corporations

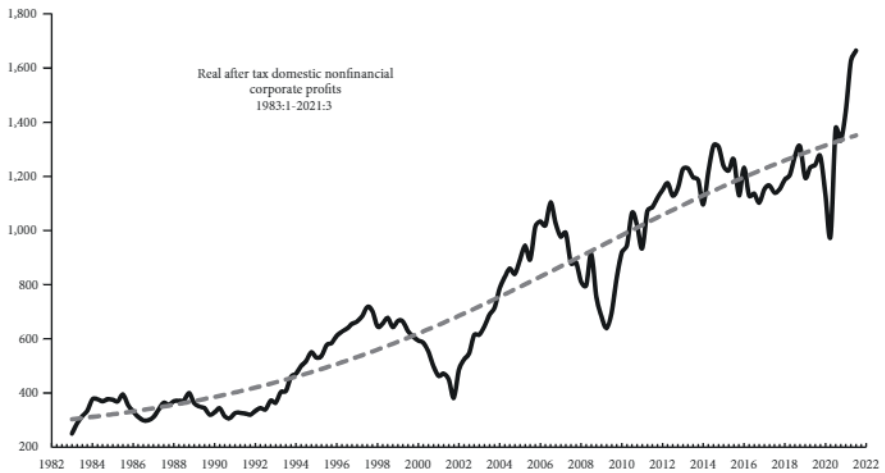


Figure A2. Mass of real net corporate profits, USA, 1983:1-2021:3 for domestic non-financial corporations (continued...)

