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# Rethinking Long Cycles: Are the 1990s the Onset of a New Phase of Capital Accumulation?

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**Abstract** This paper deals with the long cycles that characterize the evolution of capitalist economies. It begins with a discussion of epochs of expansion and contraction in the level of economic activity and makes an effort to move towards a meaningful periodization of economic history. The claim that this paper raises is that profitability regulates the phases of these long cycles. The theoretical discussion on the mechanics of the long-term movement in profitability and the phases of long cycles is supported with data on the profit rate from various OECD economies. The empirical evidence is consistent with the hypothesis that the 1990s mark the onset of a new phase of accumulation. The salient feature of this new phase is the dominance of information technologies and the associated notions of the “new economy” and globalization. However, unlike, the popular view that regards the “new economy” as depression-free, this paper claims that the “vices” of the old economy continue to exist.

*Keywords:* Long waves, Kondratieff, Phase change, Capital accumulation, Profit rate.

*JEL classifications:* B14, B15, E32

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## 1. Introduction

In recent years there is a growing literature that deals with the current stage of the global economy. In this literature there is a discussion about the extent to which the 1990s or late 1980s mark the onset of a new period of accumulation similar to that of the first post-WWII decades. The evidence that is usually gathered varies from common-sense ideas and intuition to econometric techniques that focus on major ad hoc variables such as GDP or investment and on the basis of their behavior they identify the phase change (Zarnowitz, 2000; Poterba, 2000). It is true that, in both cases, there is not a well-specified theoretical model to support the selection of the variables that are being employed. In addition, in the recent years a new concept is being formulated known as the “new economy”. Proponents of the “new economy” argue that the structure of modern economies has gone through a substantial metamorphosis that insulates them from the vices of the old, in the sense that the market system today has developed powerful built in mechanisms, which have transformed the old recession-prone economies to new recession-free ones. At the same time, the “new economy” maintains the virtues of the old economy; that is high saving and investment rates and all this with the advantage of less government intervention. It is important to stress that this metamorphosis is mostly the result of the new technologies and not necessarily of government intervention, as was the case with the “mixed economy” of the 1950s and 1960s.

It has been argued that the strong economic growth that characterizes the US and the other OECD economies in the decade of the 1990s is persistent precisely because it stems from the willingness of the corporate world to undertake innovative and, therefore, risky investment projects. These developments have been facilitated by the downfall of the centrally planned economies; the high unemployment rates and the idea of flexibility in employment led to greater work effort and raised productivity. In addition, the reorganization of the corporate economy through downsizing and mergers gave rise to substantial increases in profitability. Naturally, these processes could not be contained within national borders and have taken on global proportions; for example, innovative investment depends a great deal on open international markets, since national markets do not provide a big enough payoff for taking high risks anymore.<sup>2</sup>

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<sup>2</sup> It seems that these developments have created a lot of turmoil internationally and may slowdown this process as the recent demonstrations against WTO have revealed.

The point that this paper stresses is that the fundamental metamorphosis of economies which currently is taking place is not a unique moment in economic history, but rather the expected outcome that emerges in the upswing phase of a long cycle. The remainder of the paper is organized as follows: the next section deals with the identification of the various phase changes in the past on the basis of appropriately normalized price data<sup>3</sup> from the US, UK, French and Greek economies and it is reminiscent of the pioneering work of Kondratieff (1935), originally published in 1926. The third section develops the mechanics of the long-term movement in profitability as an explanation for the phase-change in the process of capital accumulation. In the fourth part the theoretical discussion is supported with empirical evidence from selected OECD economies. In the fifth section we conclude.

## **2. Long waves in capitalist development**

Nowadays, an increasing number of economists accept the idea that the economic variables are subject to recurrent fluctuations. In this literature there are two juxtaposed positions: the first views the economy as a fundamentally stable system that continuously tends toward equilibrium and the cycles are explained by purely random external shocks; the second regards the economy as a living organism with internally generated disequilibrating forces that give rise to business fluctuations of various lengths. Schumpeter (1935, p. 15) distinguished the following types of cyclical fluctuations named after the person that discovered them: Kitchin or inventory cycles with a length of 3–5 years; Juglar or investment cycles with a length of 7–11 years; Kuznetz cycles with a length of 15–25 years, which are associated with fluctuations in the construction activity; and finally, Kondratieff cycles or long waves with a length of 45–55 years, which are connected to large scale innovations such as the creation of railways network, electrification, mass production of cars, etc. From these fluctuations the long waves are relevant in the context of our discussion and as research has shown, long waves are easier discovered in price than in output data.<sup>4</sup> For this purpose, we follow the methodology and tradition that started with the work of Kondratieff, according to which the fluctuations of the normalized (by the price of gold) price index indicate the stage of the

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<sup>3</sup> The price index is perhaps the only reliable and, at the same time, relevant to our purpose, time series data that covers centuries of economic history.

<sup>4</sup> See for example the work of Metz (1992) who identifies long waves in output data.

business cycle (Duijn, 1983). In the past, the increase in the price level was identified with the upswing stage of the economy, whereas the fall in the price level was identified with the downswing in the level of economic activity.

In Table 1 below, we cite the periodization of long waves based in part on Kondratieff's (1935) paper. We call these waves idealized because we set precise dates for the turning points. Nevertheless, Kondratieff provided a range of variation for the turning years that may differ from country to country, from five to seven years (Kondratieff, 1935, p. 32). In Table 1 we also give the characterization of each wave following in part Schumpeter's (1935, pp. 13–14) view.

**Table 1.** *Idealized long waves*

FIRST LONG WAVE	1790–1845 (55 years)
Prosperity (The industrial revolution)	1790–1815 (25 years).
Crisis (The hungry forties)	1815–1845 (30 years)
SECOND LONG WAVE	1845–1895 (50 years)
Prosperity (The Victorian era)	1845–1870 (25 years)
Crisis (The great depression)	1870–1895 (25 years)
THIRD LONG WAVE	1895–1940 (45 years)
Prosperity (The belle époque)	1895–1920 (25 years)
Crisis (The 1929 crisis)	1920–1940 (20 years)
FOURTH LONG WAVE	1940–1985 (45 years)
Prosperity (The golden age)	1940–1965 (25 years)
Crisis (The silent depression)	1965–1985 (20 years) <sup>5</sup>
FIFTH LONG WAVE	1985 –
Prosperity (The new golden age)	1985 – 2005

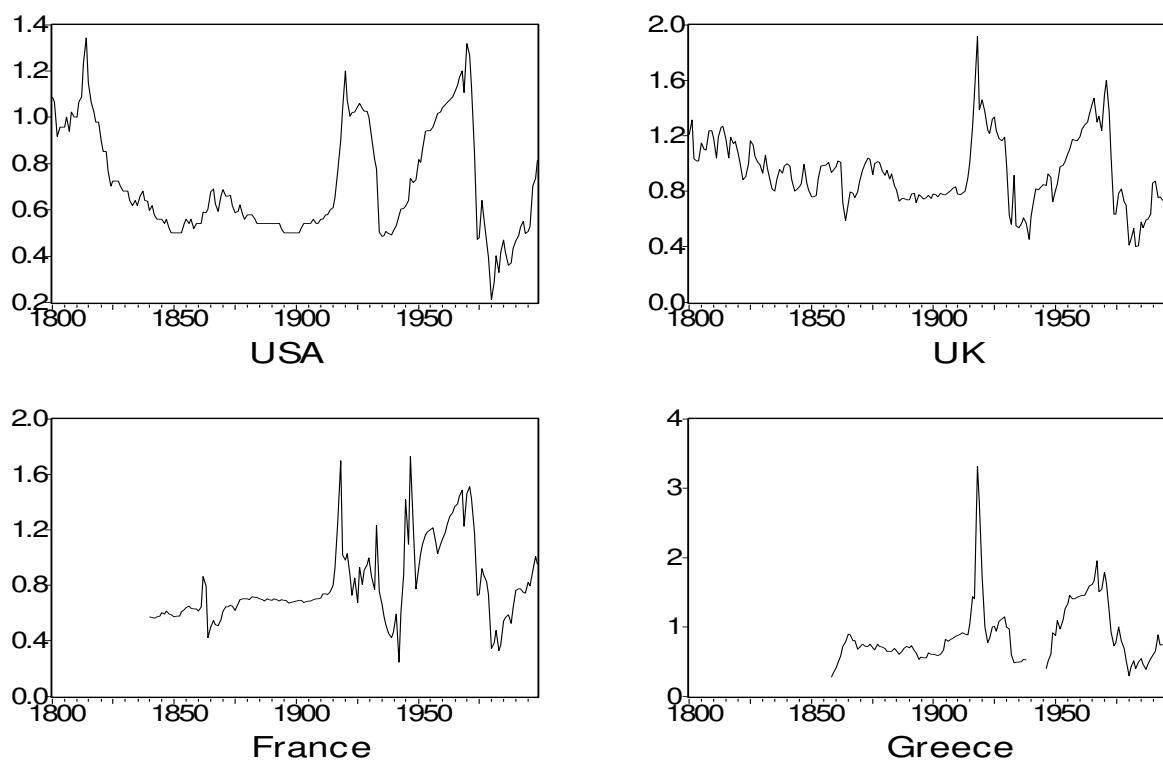
Source: Kondratieff (1926, p. 31) until the year 1920, for the years after we follow the most plausible (to our view) dating.

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<sup>5</sup> In the initial version of the paper the end year was 1990, however, in retrospect the year 1985 seems more suitable as a tipping point year.

Figure 1 below displays data on consumers price index (CPI) normalized by the price of gold (Pg) for the economies of the US and the UK for the period 1800–1999. The data for the French economy are for the period 1845–1999 and for the Greek economy for the period 1858–1999 (see also Tsoufidis 2001a).

**Figure 1.** *Long Waves in prices, in the US, UK, France and Greece*



Historically, the above outlined process is found in all periods of depressions. A consistent feature of all of them is the fall in the normalized price index ( $CPI/P_g$ ) which was followed by the discovery of new richer gold mines and by the application of more advanced techniques of extraction, which increased the production and productivity in the gold industry. For example, in the crisis after the Napoleonic wars, the fall in the ratio  $CPI/P_g$  increased the profitability in the gold industry and led to the discovery of gold, initially in California and latter in Australia. In the decades 1870-1890 the gold standard was in operation

during which the price index was falling; meanwhile, the supply of gold was fixed, because the rich gold mines in Alaska and in South Africa were discovered and put into operation much later. Therefore, with the price of gold approximately constant and with a falling general price level, it follows that the purchasing power (or the relative price) of gold was rising; gold became more expensive relative to the other commodities. Meanwhile, the increase in demand for precious metals implied that governments were prepared to buy gold at any price, which is equivalent to saying that governments internationally were essentially financing the expansion of the gold industry. The result was to provide more incentives for the discovery and full utilization of new more productive gold mines. Productivity in the gold industry increased once again and that led to a fall in the relative price of gold; that is the ratio  $CPI/P_g$  increased, a condition which is consistent with another long wave of expansion.

Hence, we see that the discoveries of new gold mines and new techniques for the extraction of gold are by no means random events. For example, Kondratieff (1935) argued that the discoveries of gold mines or techniques for its extraction take place only when objective conditions are fulfilled, that is the price of gold is very high and profitability in the gold industry has increased substantially.<sup>6</sup> The countercyclical movement of the price of gold was observed also during the “silent depression” of the 1970s, where the price of gold increased substantially and that led to the end of the Breton Woods agreements, while in the current phase of recovery we observe that the price of gold has dropped once again. These phenomena and their successive repetitions (five times) encourage us to think that they constitute more manifestations of the operation of systematic forces rather than symptomatic facts.

Of course, the above pre-supposes adherence to the gold standard or some form of it such as the gold exchange standard that was followed by many countries for certain periods of time. However, if we suppose that the economy is off the gold standard then the above outlined process continues to work, albeit in a modified way. For an economy to be off the gold standard it means that the money that is issued might be inflationary. In these cases since there is an international market for gold it follows that the excess money will become excess demand for gold and the price of gold in terms of the domestic currency will

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<sup>6</sup> As Villar notes: “The greatest discoveries [of gold] always took place in periods of generally low prices, in other words of very high relative prices for gold and silver. Christopher Columbus did not emerge by pure chance” (Vilar, 1976, p. 342).

rise to compensate for the over-issuance of paper money. So the normalized price index will reflect the stage of the long cycle once again. In the post-WWII period and in particular in the slowdown of the 1970s and 1980s, the price level was rising; however, the price of gold was rising at an even faster rate. Thus, in the post-1970 period the price of gold moved not only counter-cyclically, as was the case in previous downturns, but also its price increased furthermore because the general public found a way to protect its savings from the inflationary pressures. The above discussion, by no means constitutes the rationale for the long waves, is only an effort to explain why long waves in the level of economic activity are reflected in the movement of the normalized price index.<sup>7</sup>

We can observe that in all four countries the normalized prices follow approximately the same pattern despite substantial differences in the level of economic development. Some discrepancies that appear are ironed out if one adopts a long run view. In Figure 1, we observe in the case of the US and UK economies four long waves and an upward phase of the fifth one. A similar picture is obtained for the French and Greek economies with the difference that there is no data for the first long wave. It is important to point out that the normalized price index merely reflects the developments that take place in the real economy, and does not, of course, cause them (Kondratieff, 1935).

### **3. The mechanics of profitability and phase change**

The data on normalized (by the price of gold) prices simply reflects the cyclical evolution of the economies; it does not explain these cycles. There have been various theories put forward for the explanation of long waves ranging from swarms of innovations (Schumpeter, 1939) and prices of agricultural products relative to industrial ones (Rostow, 1975) to changes in the social structures of

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<sup>7</sup> The CPI for the US, UK and French economies and the price of gold as well as the exchange rate of dollar to pound, from 1800–1999, are from global financial data. The data for the Greek economy for the period 1858-1865 is taken from Kostelenos (1995) and for the years 1865-1938 from Dertilis (1995), in the same source we got data on the exchange rate of drachma to pound. The data after WWII is taken from the Greek National Statistical Service and the Bank of Greece. We also got data for Japan from 1900–1999 with similar pattern, while it became impossible to construct a consistent database for Germany due to episodes of hyperinflation and changes (twice) in the monetary unit.



accumulation (D. Gordon, 1980). In our view the explanation for the long waves must be looked for in the fundamental variables that govern the evolution of the economies, and from these variables the profit rate plays the prominent role. In fact, almost all the great economists of the past (e.g., Smith, Ricardo, Marx, J. B. Clark, Keynes) argued that the movement of rate of profit regulates the rhythm of capital accumulation of the economy. In addition, the rate of profit in the long run displays a tendency to fall, which sooner or later leads to a stagnant economy. Nevertheless, the explanations that they have been offered for the upswing or downswing phase of the economy are usually intuitive and not unambiguous. If we exclude the trivial case of a zero profit rate, which of course eliminates any incentive for accumulation, then the explanation that is usually offered is that the desire for accumulation declines with a falling rate of profit and, of course, it increases with a rising rate of profit. For Marx a falling or rising rate of profit in the short run is consistent with any stage of the economy. If we restrict the analysis to the downward stage of the economy, it is important to point out that the fall in the rate of profit in and of itself does not lead to the manifestation of crisis inasmuch as the profit rate, *ceteris paribus*, will exceed the long term rate of interest and, therefore, there does not appear to be any particular reason for the slowdown in investment activity. In Keynes, for example, investment activity is determined by the difference between the marginal efficiency of investment (i.e. Keynes's measure of expected net profitability) and the rate of interest. Consequently, the fall in the rate of profit is absolutely consistent with the increase in the mass of real net profits and also with strong economic growth.<sup>8</sup> In Marx we find a detailed explanation of the reason why a persistent fall in the rate of profit leads systematically to economic crises, despite the fact that the rate of profit will exceed the rate of interest. The work of Shaikh (1992) explicitly recognizes the systematic relationship between the profit rate, the mass of profits and the manifestation of crisis. In the formal model that he presents, capitalists possess a given propensity to save but, nevertheless, the falling rate of profit leads to a stagnant mass of profits and to the crisis. This relationship can be cast in terms of calculus, specifically, starting with the usual formula of the rate of profit  $r$ , which is defined as the ratio of total net profits  $s$  to the stock of capital  $C$ , we get:

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<sup>8</sup> Similarly, it could be argued that a rising rate of profit does not necessarily lead to a growing economy.

$$r = s/C \text{ or } s = rC$$

The total differential of the above gives:

$$ds = r dC + C dr$$

We divide through by  $dC$  and we get:

$$\frac{ds}{dC} = r + C \frac{dr}{dC}$$

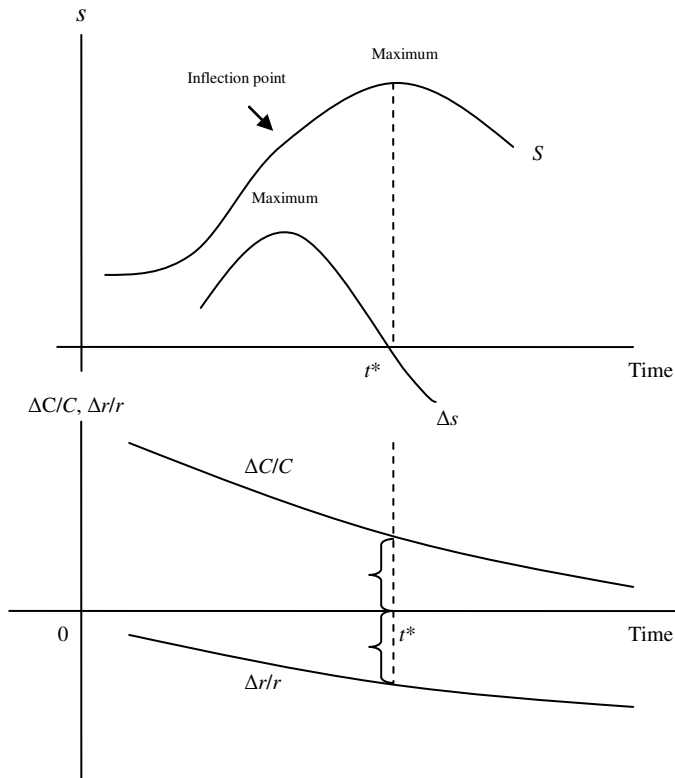
We take  $r$  as the common term on the right hand side of the above and we get:

$$\frac{ds}{dC} = r \left( 1 + \frac{dr}{dC} \frac{C}{r} \right)$$

The term  $ds/dC$  indicates the way in which profits change in every change of capital stock or the change in profits for each unit of investment ( $I=dC$ ). It is obvious that the change in profits for each unit of investment is equal to zero only if the elasticity of the rate of profit is equal to  $-1$ , a condition that requires a falling rate of profit. This occurs at the point when profits are maximized, that is at the point where the percentage change in capital stock ( $dC/C$ ) is equal to the percentage change in the rate of profit ( $dr/r$ ) in the opposite direction. As the economy reaches this point the motivation for new investment fades away, because any profits from new investment are offset by the cost of that investment, thereby holding the mass of profits stagnant. The persistent lack of new investment and the rising unemployment rate form the two conditions for depression. It is important to stress that this process is slow and takes place only in the long run. The fall in the rate of profit for a few years does not necessarily imply the slowdown in investment

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activity, and if the rate of profit is falling for a protracted period of time then the mass of real (deflated) profits stagnates and the economy displays the conditions of depression.



**Figure 2.** *Mass of real profits, marginal profits and capital accumulation vs. growth in the rate of profit<sup>9</sup>*

This stage of depression is the most appropriate for institutional change be it radical or conservative. In both cases, however, there are built in mechanisms that are under way and enable the economy to overcome the crisis. First of all, the high unemployment rates and social misery in general give rise to large

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<sup>9</sup> This Figure does not appear in the previous version.

increases in profits, through the intensification of the labor process and substantial reductions in the real wage. Meanwhile, the firms that have survived the crisis can take advantage of the devaluation and destruction of the value of capital of other firms and buy at very low prices and, in doing so; they accelerate the process of concentration of capital. These processes are facilitated, from the fall in interest rates because of the lack of demand for money for investment. Consequently, a “stagnant” financial capital seeks for investment opportunities, especially for the development of new products and techniques. This is the reason why new products are introduced on a massive scale during the depression period and the early upswing stage of the economy.<sup>10</sup> The length of a full cycle for some authors (Kondratieff, 1935, D. Gordon, 1980) depends on the length of investment in infrastructure and for some other authors (Schumpeter, 1939) on the time that it takes for major innovations to spread throughout the economy.

#### **4. From the economic crisis to the new golden age of capital accumulation**

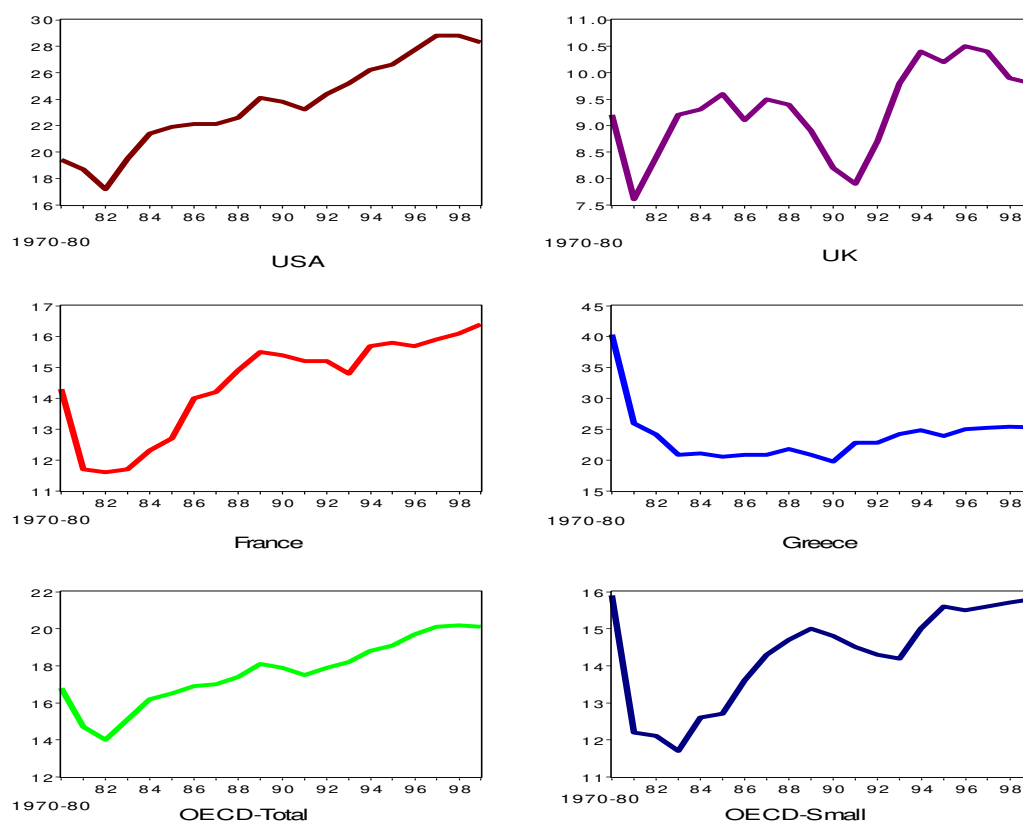
In the figures below we present the rate of profit for the US, UK, French and Greek economies as well as for the total OECD along with the small OECD countries. Clearly, the 1990s indicate a long lasting recovery stage of the economy. It seems that the recession started in the mid to late 1960s and continued during the decade of the 1970s and part of the 1980s. The recession of 1982 was significantly deep, since the unemployment rate exceeded the 10 percent borderline, which, according to Heilbroner (1993), distinguishes depressions from recessions in the case of the US economy. It could be argued that the recovery that was observed in the mid 1980s was somewhat artificial because of the early application of neoliberalism in the US (in the form of Reaganomics) and latter in many other OECD countries, which depressed the wages to levels that enabled the increase in profits and profitability in general. Meanwhile, the process of concentration and centralization of capital also took place through the acceleration of merger activities at a national and a global level. While the movement of the rate of profit is a rough indicator of the stage of the economy, nevertheless we have argued that a falling rate of profit is consistent with conditions of accelerated growth and a rising rate of profit does not necessarily indicate that the economy is

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<sup>10</sup> One could also add the wave of privatizations in the mid-1980s and 1990s that took place in many European countries.

in its expansionary stage. Only if the rate of profit follows a persistent upward or downward trend does it exert a significant effect on the mass of real net profits and by that on the level of investment activity and the unemployment rate. Figure 3 portrays the rates of profit of the business sector of the US, UK and Greek economies, while the last two graphs display the profit rate for the total OECD as well as the small OECD countries.

**Figure 3. Rates of return on capital in the business sector<sup>11</sup>**



<sup>11</sup> Data after 1980 is more reliable than before. It became impossible to combine a consistent database starting from the 1950s or the 1960s. Source: *Economic Outlook*, June 1998 and various other issues. It seems that this is the best that can be done with the availability of data. If one is interested in the evolution of the profit rate for other OECD countries see Glyn *et al.* (1991) and for Greece see Tsaliki and Tsoulfidis (1994) Maniatis *et al.* (1999).

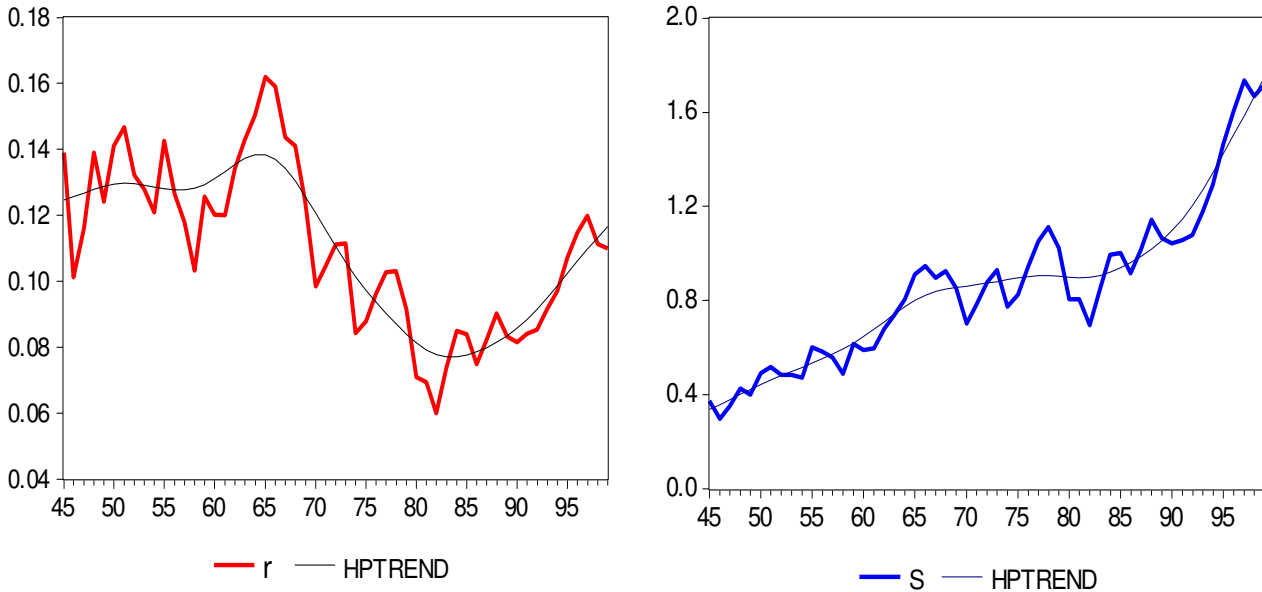
From the figures we can observe that the movement in the rate of profit of the US shapes the movement in the rate of profit of the total OECD economies. Clearly, the rate of profit after the mid-1980s exceeds the average rate of profit of the period 1970-1980. For economies such as Greece and the average of small OECD economies, the rate of profit in the decade of 1970-1980 continues to be higher than the rate of profit in the 1990s. Nevertheless there is a clear upward trend and it seems that if the trends continue the current rate of profit will exceed the average of the 1970s and the overall picture will become more uniform globally.

As we argued, the movement in the rate of profit by itself is not enough to characterize the phase of the economy. For that we need the evolution of the total real profits. We have restricted the analysis to the US economy with data that we got from the BEA website and have covered the period 1945-1999. In the figure below the first graph displays the rate of profit ( $r$ ) along with its trend (derived with the help of the Hodrick-Prescott filter) for the corporate sector of the US economy estimated as the ratio of total profits net of taxes, inventory valuation adjustments and capital consumption allowances over the corresponding net capital stock<sup>12</sup>

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<sup>12</sup> Corporate profits include capital consumption adjustments that remove differences between true economic depreciation on a replacement cost and depreciation on historical cost. The inventory valuation adjustment on the other hand removes any over-statement of corporate profits that comes about from inflation and the resulting nominal gains on inventories and work in progress.

**Figure 4.** Profit rate and mass of real profits in the US corporate sector



We observe that the rate of profit follows an upward trend until the mid- to late 1960s and then the trend turns downward. The trough in the rate of profit is the year 1982, the worst year of recession; a recession that continued for most of the 1980s. As we said, however, the movement in the rate of profit in and of itself does not determine the stage of the economy. One needs information on the evolution of the mass of real profits and on their behavior to characterize the stage of the economy. The second graph portrays the mass of real profits (deflated by the GDP deflator). We observe that profits stagnate in the mid-1960s and continue up until the late 1980s. For example the level of real profits in the year 1965 was approximately equal to that of the year 1985. Some fluctuations in the real profits in the years between might be attributed either to the normal operation of the short-term business cycles or to the intervention of a conservative government that smashed the labor movement and contributed substantially to the decrease of the number of unionized workers.<sup>13</sup> Thus, some years of recovery in the 1980s did not last, precisely

<sup>13</sup> In the USA only 10 percent of the labor force in the private sector is currently unionized as opposed to almost 35 percent back in the 1950s. In addition, the number of strikes in the US has been extremely low and only a few thousand workers have been involved, for example in the year 1996 there were only 10 strikes involving five thousand

because they were brought about artificially through political intervention and not by the operation of the internal cathartic crisis mechanisms. It is interesting to note that the onset of crisis is in mid-1960s, and the early 1970s mark the trough of the long cycle. Nevertheless, in terms of human suffering certainly the downturn in the 1982 is the worse of all, since it was accompanied with an unemployment rate that exceeded (in the USA) the 10 percent of Heilbroner's borderline. Consequently, the downturn of 1987 was not serious and that of the year 1991 was a mild one and could be taken as the starting point of a new era of capital accumulation.

## **5. Concluding remarks**

From the above discussion it follows that the movement of the normalized price index of the US, UK, French and Greek economies reveal the existence of long cycles of Kondratieff type. We observe that these cycles do not merely repeat themselves, but each and every one of them has its own individual characteristics that differ in duration and intensity. Moreover, the phenomena that are displayed in each cycle are often specific to the period under investigation. For example, the recent “silent” depression of the 1970s did not affect the economies in the same way that affected them in the depression of the 1930s. The so called welfare state protected to a large extent, the poor and the unemployed and ameliorated the negative consequences of the depression by increasing the total demand and by restricting the size of the unemployment level to relatively tolerable levels (Tsoulfidis, 2001b). However, the large size of the government sector rendered the Keynesian policies ineffective with regard to economic growth and therefore government expansionary policies became inflationary with minimal effects on economic growth.

Our data on normalized prices together with the movement of the profit rate and the mass of real profits lend support to the view that a new stage of economic expansion is already under way, which is being met with the expected Kondratieff phenomena; that is innovations on a large scale, the drawing of new markets in the orbit of the world economy. The empirical evidence shows that profitability has already

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workers (Webber, 1999). In addition, the reduction in the number of unionized workers may be attributed to the shift from manufacturing to service related activities traditionally characterized by low unionization factor.



increased substantially and it is adequate enough to keep the expansion going with minimum effects on the price level since the increase in productivity is large enough to reduce unit costs substantially.

Finally, as with the golden age of accumulation of the first postwar decades and the euphoria that accompanied them led a lot of economists to the idea that the business cycle was finally defeated. Nowadays, there is a similar euphoric atmosphere; as this can be judged from discussions about the so-called “new economy”, which —according to its proponents— displays features that appear similar to those of the “mixed economy” of the 1950s and the 1960s. The difference between the current “new economy” and the “mixed economy” is that the latter was supposed to protect the economy from serious business fluctuations through the government’s stabilization policies. In contrast, the proponents of the “new economy” claim that the market itself has created internal defense mechanisms for the conversion of otherwise serious business fluctuations to innocuous ones. The following quotation from an often-cited article entitled “The End of the Business Cycle” characterizes the whole literature and really echoes the sentiments of the decade of the 1960s! (*e.g.*, Bronfrenbrenner, 1969). In this article we read: “Business cycles have come to be taken as a fact of life. However, modern economies operate differently than nineteenth-century and early twentieth century industrial economies. Changes in technology, ideology, employment, and finance, along with globalization of production and consumption, have reduced the volatility of economic activity in the industrialized world. For both empirical and theoretical reasons, in advanced industrial economies the waves of the business cycles are becoming more like ripples” (Weber, 1997, p. 65). There is no doubt that the claims for a “new economy” are true only in so far as the economy is in the upswing stage of the long wave. A stylized fact of this stage is that the “years of prosperity are more numerous”, whereas in the downswing stage of the long wave “the years of depression predominate” (Kondratieff, 1935, p. 33). It seems, that once the economy finds itself in its downswing stage the years of the depression will be even more formidable, since the proponents of the “new economy” argue for the dismantling of most of safety nets that are associated with the welfare state, which in the slowdown in the 1970’s contained both unemployment and business failures to relatively tolerable levels.

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