The Growth of Unproductive Activities, the Rate of Profit, and the Phase-Change of the U.S. Economy

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Abstract

This paper by using the categories of productive and unproductive labor and by extending and further elaborating the data series utilized in Shaikh and Tonak (1994) reveals a sharp expansion of the unproductive activities in the U.S. economy during the period 1964-2007. The combination of growing productivity and the stagnant or even falling real wages of productive workers increased the rate of surplus value in the recent decades to unprecedented highs. As a consequence, the general rate of profit from the early 1980s onwards was also rising until the last years of our analysis; meanwhile the net rate of profit remained at levels much lower than those of the 1960s and the slightly rising trend during the post-1980s has been already reversed. The patterns of these crucial variables reveal startling similarities with the onset of the slowdown that started in the mid- to late 1960s.

1. Introduction

This paper extends and further elaborates a similar study that was pursued mainly by Shaikh and Tonak (1994) but also by Moseley (1985, 1992, 1997) and Mohun (2005, 2006). More specifically, we are mapping the national income and product accounts (NIPA) data of the U.S. economy to respective Marxian categories. Such efforts had started in Shaikh's pioneering work already in the 1970s (e.g., Shaikh 1978) and culminated in his (joint with Tonak) book (1994).[1] In this mapping the distinction between the various spheres of social reproduction, that is, production,

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[1]The earlier systematic efforts were by Gillman (1958) and Mage (1962).

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distribution, social maintenance, and personal consumption, as well as the classification of labor activity into productive and non-productive, is crucial. There is no doubt that such a distinction is not without its controversies, but Shaikh and Tonak (1994) showed that the distinction is not only theoretically consistent with Marx's analysis but it is also operational, thereby making possible the even finer classification of activities and sectors into productive and unproductive and revealing the differences of the Keynesian and neoclassical NIPA categories from the respective classical and also Marxian categories. The difference is not nominal but essential for the deeper understanding of the dynamics of the capitalist economies as well as their possible phase-change.

In our approach, the times series data start from the year 1964 and so for twenty-five years our estimates can be compared to those of Shaikh and Tonak (henceforth, ST). It is interesting to note that while we have no conceptual differences with ST's work, we discover that in some cases, due to the lack of data, they were forced to make a number of extrapolations over extended periods of time. Furthermore, some of the industries in the period prior to the 1980s were not that important in terms of their size, and although in the analysis of ST these industries would be classified as productive, nevertheless because of their relative small size and lack of detailed data they were subsumed in the unproductive activities. With the progress of time though the relative weight of these industries increased and, at the same time the availability of detailed data, even retrospectively, and from the 1960s if not earlier, made possible the proper treatment of such industries, and therefore the more accurate estimation of all variables (see the appendix for more details).

The remainder of the paper is organized as follows: section 2 presents a summary account of the notion of productive/unproductive labor and deals with some recently advanced criticisms about its desirability. Section 3 presents our estimates of the fundamental Marxian variables revealing some remarkable changes that took place in recent decades. Section 4, using the estimates of Marxian accounts, evaluates the current state of the economy and discuses the possible phase-change. Section 5 concludes.

2. The Meaning and Significance of the Distinction

Shaikh and Tonak (1994), Moseley (1997), and Mohun (2005, 2006) have all noted the growth of "non-productive" sectors of the economy and, associated with these, "value added" and employed labor. We know that Marx, like Smith and Ricardo before him, had a deeper interest to lay bare the dynamics of capitalist development and in this context he classified the spheres of social reproduction into those that require labor, i.e., the spheres of production, circulation, and social maintenance; the fourth sphere of personal consumption does not require labor, and in neoclassical terms would be characterized leisure activity.

For Marx, productive is the labor, which is activated in the sphere of production, where capital hires labor and non-labor inputs in order to produce more value than the value of inputs. The increase in value is attributed to the labor input which has the capacity to create more value than that required for its own reproduction. As for the non-labor inputs, they are transferred either wholly in the final product, as in the case of raw materials, or bit by bit through depreciation, as in the case of fixed capital. By contrast, in the sphere of distribution, there is no creation of new (use) values, but those that have been already created in the sphere of production change possession or ownership. Similarly, the labor and non-labor inputs employed in the sphere of social maintenance are engaged in the preservation of the existing status quo.

In sum, unproductive is the labor which, rather than expanding production and wealth of society, is simply consuming wealth that has been already produced in order to distribute or protect (maintain) the wealth created in the sphere of production. Hence, it becomes evident why the

classical economists and Marx paid so much attention to the distinction of labor activity. The discussion in Marx is mainly in the *Theories of Surplus Value*, where productive and non-productive labor are defined in a detailed and positive and not residual way (e.g., "unproductive is all the labor that is not productive"). The underlying idea is that the increase in productive labor and activities is associated with the creation of new wealth, and therefore the promotion of economic growth; by contrast, the increase of unproductive labor and activities is associated with the distribution or the maintenance of social order, and therefore the diminution of social product that could be invested in the sphere of production, thereby slowing down the growth potential of society.

ST (1994) have taken the painstaking task of showing the consistency of classical and especially Marx's theory of what is and what is not productive labor, and of operationalizing these concepts by mapping the orthodox national income and product accounts (NIPA) into classical Marxian accounts. In short, the mapping is not just for the devising of another accounting system, among the many that appeared in the long and turbulent history of these accounts (see Studenski 1958, inter alia), but rather for the demonstration that this alternative accounting system reveals a characteristically different overall picture of the determinants of the alternate stages of growth and stagnation. This research has inspired many other studies in a number of countries, for example Mohun (2001) for Australia; Yu and Feng (2007) for China; Tsaliki and Tsoulfidis (1989) and Maniatis (2008) for Greece; Marina and Moseley (2000) for Mexico; Seongjin (2007) for S. Korea; Cokshott, et al. (1995) for the UK; and Cronin (2001) for New Zealand.

Before we embark on our estimates and analysis, a few clarifications are in order. First of all, the definition of productive-unproductive labor has nothing to do with orthodox economics' distinction between goods and services, whose difference is really about the time of consumption or use. Services are consumed at the time of their production, whereas goods are consumed at a time which differs from the time of their production. In this sense, there are services that are productive, and therefore add to the wealth of an economy. For instance, workers employed in the transportation industry transfer use-values from the place of production to the place of consumption and in so doing complete the production process. Productive may be the services of actors and actresses in a film or a theatre in the sense that they are hired by capital as wage laborers in order to sell their recreational services to the public interested in the film or the play, and at the same time provide a profit for the capitalist. However, we cannot say the same thing for the actors or actresses hired by capital in an advertisement, because this particular activity belongs to the sphere of circulation and so facilitates the selling of goods (or services) that have been already produced.

Furthermore, in the classification of productive labor it does not matter what type of goods is produced, that is necessities or luxuries, civilian or military goods, basic or non-basic goods. All labor regardless of the sphere of social reproduction that is activated is necessary and in this sense it is not meaningful to say that one kind of labor is more necessary than another. Similarly, it is not meaningful to say that one activity or type of labor is indirectly productive, because in the final analysis everything can be, in a sense, indirectly productive (Shaikh 1977; Foley 1986: 121). Clearly, social reproduction cannot be attained without the interdependence and synergy of all its spheres. The difference is that only the wage labor employed in capitalist production creates new wealth (output), while the other activities that employ labor, although useful, nevertheless either circulate the wealth that has been already produced in the production sphere or they maintain the social status quo.

Unproductive labor is of central importance to capitalism, regardless of the differences (usually minor) in its definitions. The idea is that unproductive activities are a burden to capital accumulation, because they reduce the amount of social product that can be invested productively. Thus, the higher the share of unproductive activities in the economy's social product the less is left to be

invested productively and thus the lower the capital accumulation. Of course, there must be a limit to this process of expansion of unproductive activity that Smith (1776), for instance, identified with the stationary state characterized by zero net investment. The stationary state is also envisioned by other classical economists (Ricardo and J. S. Mill) and also Marx, who identified it with the state of general economic crisis.

As is well known there is no consensus about the definition of productive and unproductive labor and also about the wealth-reducing effects associated with the rise in unproductive activities and labor. For instance, Duménil and Lévy (2004) do not accept that the growth of unproductive activities necessarily lowers the rate of profit. They argue that so-called unproductive labor is hired by the rationally behaving capitalists in their incessant efforts to maximize their profits, and to support their argument Duménil and Lévy (2004) refer to the rise in profitability in the U.S. economy during the period 1910-1950 and also after the 1980s. Their claim is that better management methods that were applied during these time periods led to a reduction in costs and an increase in the profit rate. There is no doubt that profitability, especially after 1932, increased substantially, but this may be attributed to the crisis-induced devaluation of capital, the advancement of new technologies, and the unprecedented rise in demand because of the war efforts in the 1940s. In similar fashion, it could be argued that during the 1980s and 1990s the acceleration of technological change (information technologies) and the rise in productivity together with stagnant real wages increased profits and the rate of profit.

Turning to mainstream economic theory and accounting systems, we observe that all labor, regardless of the sphere of social reproduction where it is activated, to the extent that it is being paid is treated as "productive." Whereas unproductive is the labor activity which is not paid as, for instance, household labor. This follows from the idea that if labor is paid in the market for its services then this means that it is useful in the sense that it gives utility to individuals and so they are willing to pay for it, thus rendering this activity necessary, and therefore "productive."

This view of neoclassical economists was not so easy to establish and the distinction continued to be accepted throughout the nineteenth century and started fading away towards the early twentieth century. Nevertheless, even today some national statistical agencies, for example the U.S. Bureau of Labor Statistics (BLS) or a supranational organization such as the International Labor Organization, continue to publish data based on the distinction between production and supervisory labor. The reason for this persistence has to do with the accounting system of corporations, where there is a clear demarcation line drawn between production expenditures which are part of the cost of production and administration expenditures (supervisory work and other related expenses) which are part of the gross profits (or surplus value, in Marxian terms) of the corporation, and this is how corporate accounts are kept and are reported to tax authorities. Thus, the distinction between productive and unproductive labor is part of the established prudent business philosophy and accounting practices. This is the reason why the architect of neoclassical economic theory Alfred Marshall (1890), knowing fully well the difficulty of the task, suggested that the replacement of the concept of productive vs. unproductive labor must be carried out in a gradual, although systematic, way. Marshall noted:

> And if we had to make a fresh start it would be best to regard all labor as productive except that which failed to promote the aim towards which it was directed, and so produced no utility. (Marshall 1890: 54)

Marshall's rationale became the foundation of today's orthodox economics according to which "productive labor" is any kind of useful labor. The criterion of usefulness is that someone is willing to pay for it. Thus, in the creation of the system of NIPA in the 1930s, the demarcation

line drawn between productive and unproductive labor was rendered synonymous to marketed versus non-marketed goods and services.

3. Marxian Variables and the Expansion of Unproductive Activities

Marx and the classical economists predicted that the unproductive activities in the economy would grow over time. Smith for instance was very concerned about the possible expansion of unproductive activities and labor. Notes Smith:

> Great nations are never impoverished by private, though they sometimes are by public prodigality and misconduct. The whole, or almost the whole public revenue, is in most countries employed in maintaining unproductive hands. Such are the people who compose a numerous and splendid court, a great ecclesiastical establishment, great fleets and armies, who in time of peace produce nothing, and in time of war acquire nothing which can compensate the expense of maintaining them, even while the war lasts. Such people, as they themselves produce nothing, are all maintained by the produce of other men's labor. When multiplied, therefore, to an unnecessary number, they may in a particular year consume so great a share of this produce, as not to leave a sufficiency for maintaining the productive laborers, who should reproduce it next year. The next year's produce, therefore, will be less than that of the foregoing, and if the same disorder should continue, that of the third year will be still less than that of the second. (Smith, *Wealth of Nations*, p. 325)

Marx shares this view of the effects of the expansion of unproductive expenditures on capital accumulation, and furthermore he expects that with the passage of time unproductive activities would expand. He writes:

> The extraordinary productiveness of modern industry . . . allows of the unproductive employment of a larger and larger part of the working class, and consequent reproduction, on a constantly extending scale, of the ancient domestic slaves, under the name of a servant class, including men servants, lackeys, etc. . . . (*Capital*, v. I, p. 487)

The growth of unproductive activities and labor is of course not without consequences. We expect that past a certain point the expansion of unproductive activities is not sustainable for it interferes with the normal process of capital accumulation and leads the economy to even more severe crises. The growth of unproductive activities is induced by the intensification of competition which forces capital to spend increasingly more resources in sales promotion, administration, and supervision in the effort to ascertain order within the corporation and maintain, and if possible expand, its market share at the expense of competitors. Furthermore, social cohesion requires increasingly more resources to be devoted to the provision by the government of social security benefits for the unemployed. Finally, international competition for sources of raw materials as well as for markets exerts a permanent pressure on governments to increase their military expenditures.

In conditions of a crisis there is doubt whether demand-driven policies will have the planned results with respect to the resumption of normal capital accumulation. The idea simply is that if the demand-driven policies target the unproductive sectors of the economy (finance, real estate, retail trade, and the like) the crisis will remain not only unresolved but will most likely get aggravated. The reason is that expansion of the unproductive sectors of the economy further reduces
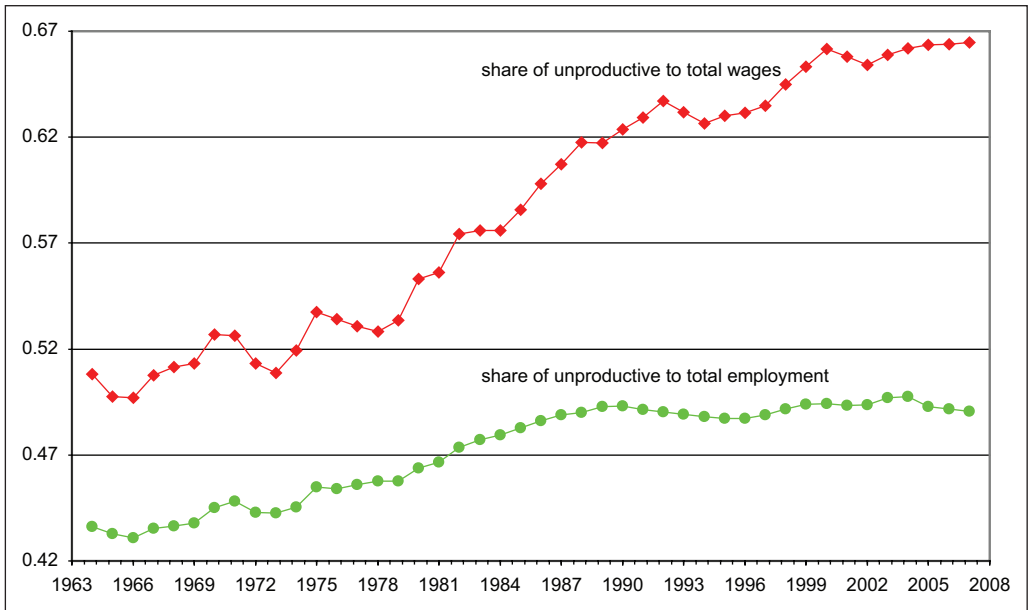
Figure I. The share of unproductive labor and wages

the investible product, inasmuch as less and less is being invested productively, and therefore economic growth slows down further.

The rise in unproductive activities has also attracted the attention of some neoclassical economists. For instance, Baumol's (1967) idea of the increasing share of services in GDP in the United States and other advanced economies is rather an indirect and certainly non-provoking way to raise the issue of productive-unproductive labor and activities in modern service economies, where the process of deindustrialization already started in the 1960s. Services, it has been argued, are of low productivity and so their expansion drags down the economy's average productivity. In similar fashion, Bacon and Eltis (1976) in the U.K. have introduced the idea of marketed versus non-marketed activities, which are characterized by a higher growth rate and are associated with the services provided by governments. In the same vein one may see the status of the famous Wagner Law that predicts the inevitable long-run growth of the public sector.

As a consequence, it comes as no surprise that unproductive activities, in the Marxian sense of the term, have an inherent rising trend. The truth is that they grow continuously, as the study of ST, Moseley (1997), and Mohun (2005, 2006) reveal and are reconfirmed by our estimates that start in the year 1964. Figure 1 displays an index of this expansion as this is captured in the share of unproductive wages to total wages, which rises persistently over the period 1964-2007, and also the share of unproductive employment to total employment, which follows a similar pattern up until the late 1980s, whereby it stays approximately constant ever since. It seems that the information technologies of the 1980s slowed down the growth rate of unproductive employment but not its wage share, which kept rising, indicating that the average wage of unproductive workers not only is higher than that of productive workers but increased furthermore relative to that of productive workers.

In the next figure we display the total surplus value produced and its most crucial component, that is net profits, which is the share of surplus value that can be spent productively and enhance the growth potential of the economy. The surplus value that remains consists of materials and
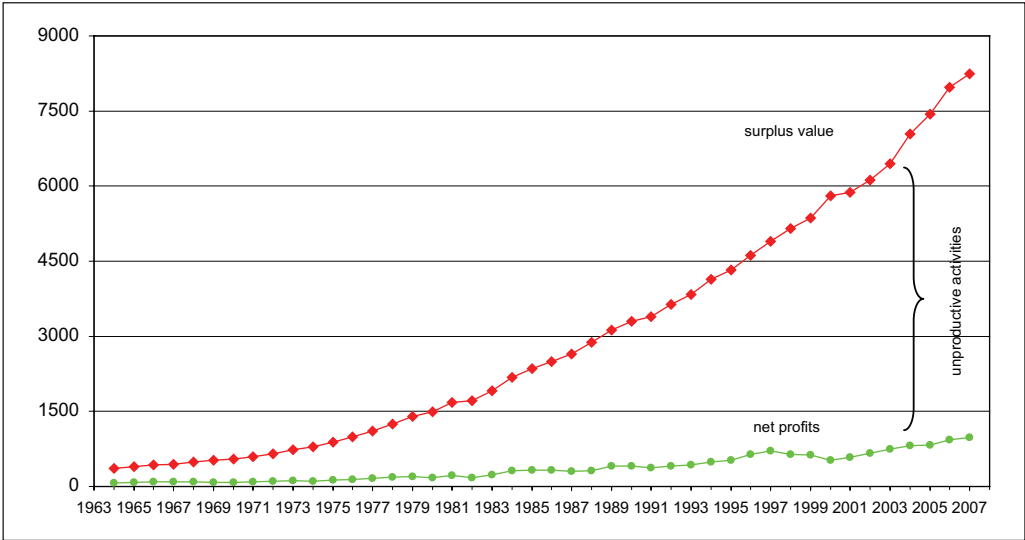
Figure 2. Surplus value, net profits, and unproductive activities

depreciation of unproductive sectors in the economy, non-productive wages, as well as taxes and royalties in general that are really deductions from surplus value and undermine the growth potential of the economy. From an inspection of the graph, we conclude the persistent growth of unproductive activities over a period of 43 years.

Such an expansion of unproductive activities is only possible if productivity increases at a rate high enough so as to compensate, more than fully, for the rise of unproductive activities. In other words, the economy must be capable of producing enough surplus value to sustain the growth of unproductive activities and also put aside a sufficient amount of surplus to invest it productively in order for the system to support its growth capacity. In Figure 3 below, we display such estimates of productivity. It is important to point out that they differ from the orthodox ones because in the numerator we have the Marxian value added (MVA) and in the denominator productive activities, not (as in the usual estimation) the total employment. More specifically, for the estimation of productivity, first we define the MVA as the sum of the net (of depreciation) value added of productive sectors of the economy plus the royalties (taxes, rents, interests) paid by the productive sectors to the royalty sectors of the economy (financial institutions, unproductive services, and government) plus the gross output of trade and real estate sectors net of imputations.[2] In the MVA we exclude the "output" of private households as well as the "output" of the government sector, that is public administration, defense, and government services but not the productive government services of transportation and communications as well as the output of public utilities. From the so estimated MVA, we subtract variable capital, that is, the wages of the productive workers. The difference is the total surplus value (S) which, divided by the variable capital (V), gives the rate of surplus value (RSV). The latter can be expressed as the ratio between productivity (y) and the real wage of productive workers (w_p). The MVA is deflated by the GDP

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[2]Total imputations in the year 1964 were about 10.8 percent of GDP and in the last year of our analysis they increased to 14.7 percent. The share of imputations in the GDP of real estate (owner-occupied housing) does not change in any significant way over the years. Thus, in 1964 the imputations in the real estate sector were 55.6 percent and remained at this percentage (55 percent) in 2007.
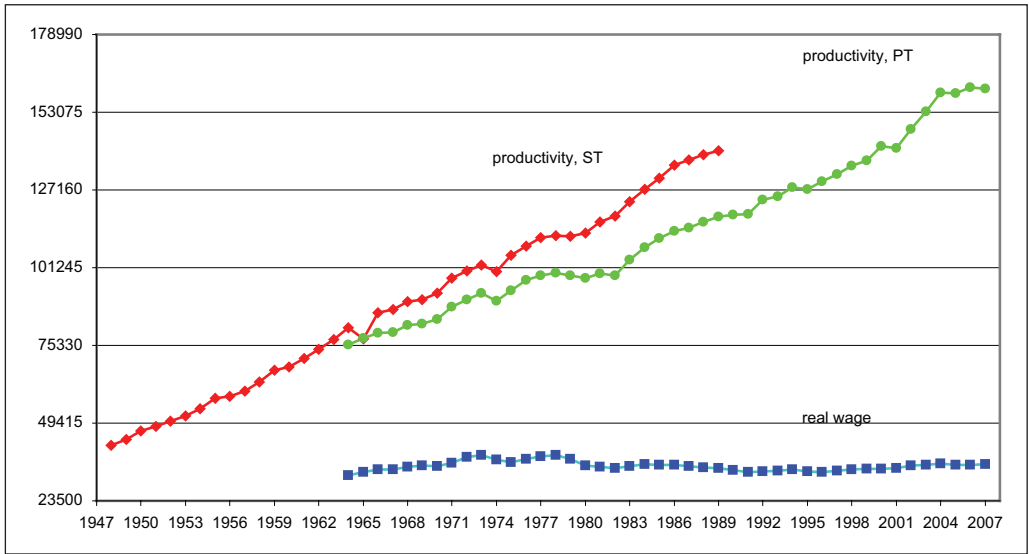
Figure 3. The evolution of productivity and real wages

deflator (P_{GDP}), while the variable capital by the consumers price deflator (P_{CPI}).[3] Formally, we may write:

$$\text{RSV} = \frac{MVA - V}{V} = \frac{(MVA / P_{GDP}) / L_P}{(V / P_{CPI}) / L_P} \frac{P_{GDP}}{P_{CPI}} - 1 = \frac{y}{w_P} \frac{P_{GDP}}{P_{CPI}} - 1$$

    Thus, in dissecting the determinants of the rate of surplus value, the movement of productivity and the real wage becomes particularly important. In Figure 3, we display the evolution of productivity as measured by ST as well as the real wage starting from the year 1964; for both variables we use their respective price indexes with 2005 as their base year. Clearly, productivity increases much faster than the real wage; it is important to note that the real wage never returns to the level of the 1970s and the year 1977 is the peak year (slightly higher than the previous peak of 1972) of the entire period.
    We juxtapose our estimates of productivity with those of ST using the same price index, P_{GDP}, in order to make them commensurate and to show that their differences are practically minimal. In fact, our estimates of Marxian value added are, on average, lower than those of ST by 0.05 percent (with a standard deviation of 1.8 percent). As for the number of productive workers our differences are on average 13.3 percent higher than those of ST (the standard deviation is 4.8 percent). It is important to note that the deviation of the two measures of productive employment increases with the passage of time. Thus, the minimum deviation is 6.3 percent observed in 1964, and the maximum deviation is 20.2 percent in 1989. These differences arise mainly from our access and use of more detailed data, and classification of industries that in the meantime became available from the newer North American Industry Classification System (NAICS) as opposed to the old Standard Industrial Classification (SIC) system. NAICS allows for the identification of 1,170 industries compared to the 1,004 found in the SIC. Furthermore, the new accounting system

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[3]The data (see the appendix) are from the BLS with base years 1982-1984, and for reasons of comparability with the GDP deflator we used the year 2005 as our new base.

allowed the separation of Drinking and Eating Places together with Computer and Related Activities that in the old SIC system were subsumed in the sectors Trade and Business (unproductive) Services, respectively, and their separation was not easy (see the appendix for details). In NAICS these two industries (along with others) are given separately, and therefore made possible the more accurate estimation of productive employment. As a consequence, our estimates of productive labor are higher than those of ST, and therefore our estimates of productivity are somewhat lower than those of ST's estimates.[4] An examination of the graph (and especially of our estimates) reveals that there is a slowdown in the growth of productivity in the mid-1960s that lasts up until the early 1980s. It is important to note that this slowdown in productivity is much more pronounced in our data (productivity PT) rather than in ST data.[5] The slowdown in productivity is consistent with the view that the 1970s and the early 1980s were a period of "silent depression." Starting from the early 1980s, the growth rate of productivity increases at high rates indicating that the productive sphere of the economy grew at a rate that was capable of maintaining the ever-expanding unproductive sectors. In the last years of our analysis, we can identify a slowdown in the growth of productivity, which is similar to that of the mid-1960s, and to our view indicates a phase-change.

Turning now to the other component of the rate of surplus value, the real wage of (productive) workers, that is their money wage divided by the consumer price index,[6] we observe a persistent overall fall since the year 1977, the last peak of the real wage. The fall in real wages can be attributed to a number of factors such as the slowdown in the level of economic activity in the mid-1960s through the early eighties when unemployment reached record levels. Other reasons may also include the defeat of the labor movement in the early 1980s, the fall in the unionization factor, deindustrialization, and the increase of the unproductive sectors as well as the rise of neoliberalism.

The combination of rapidly growing productivity and the stagnant real wages of productive workers form the ideal conditions for the unprecedented expansion of surplus value, and the rate of surplus value which reached record levels as is shown in Figure 4, where we juxtapose ST's

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[4]In similar fashion Mohun (2005: 804-805) by referring to the estimation of productive employment in the total service sector finds that ST underestimated this figure by 9.7 percent for the year 1988. Our differences with Mohun's (2005, 2006) estimates are that we count as part of productive activities the industries Eating and Drinking Places and Computer Data and Processing Services. Furthermore, Mohun does not include in his estimations of surplus value the depreciation and intermediate inputs of trade activities. In similar fashion, Mohun does not include royalties paid by the productive sectors to the Finance & Insurance industry and unproductive services as well. These payments receive the form of patents, net interest, finance charges, and legal fees in order to secure access to technical processes, money, law assistance, *etc*. In short, Mohun's estimate of the value added amounts to the difference between net GDP minus general government wages and GDP imputations.

[5]In particular, the annual growth rate of productivity during 1965-1982 according to our estimates (PT) is 1.40 percent as opposed to 2.50 percent in ST's estimates, which is lower than that of the 1948-1965 period that was 3.60 percent. For the period 1982-1989 the two growth rates of productivity were very close to each other, that is 2.59 percent in our estimates as opposed to 2.42 in ST's estimates (see Table 1 for the estimates of the other periods as well as Mohun's (2005, 2006) estimates).

[6]It is important to point out that, as with the official NIPA accounts, the reported consumers price index is not without its problems as it depends on the weights allocated to the various goods and services comprising the consumers' basket. An alternative set of commodities and services with different weights would give an entirely different consumer price index and, at the same time, a more realistic approximation of workers' purchasing power and standard of living.
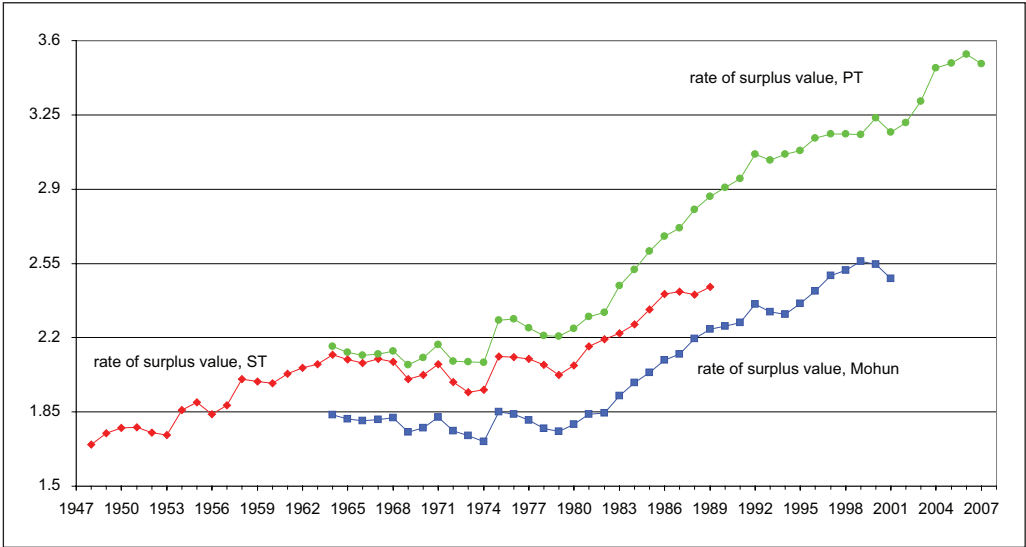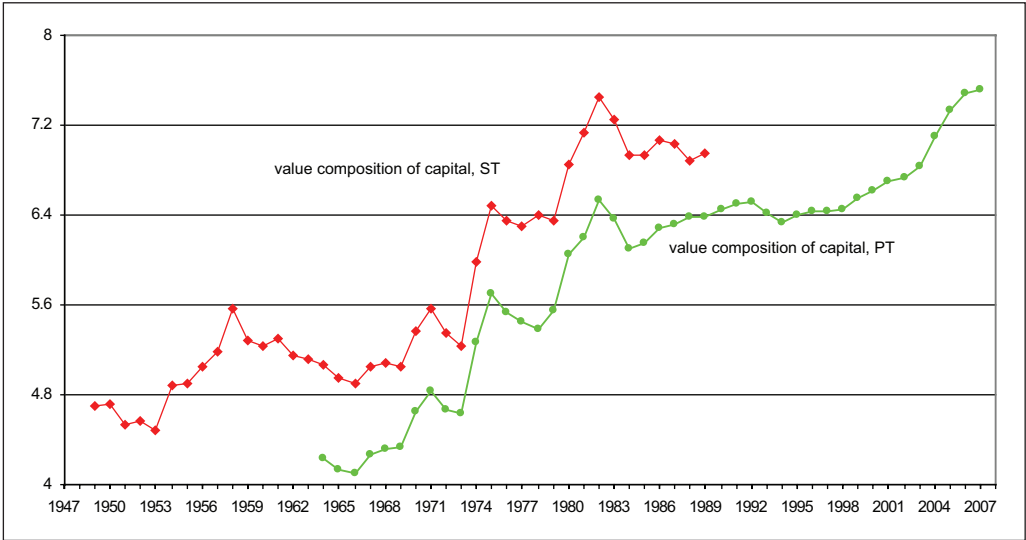
Figure 4. The rate of surplus value

Figure 5. The value composition of capital

rate of surplus value from 1948 to 1989 with our estimates that start from 1964 and end in 2007.[7] Clearly, there is an overall rising trend, which however is distinguished into three phases and the beginning of a fourth phase; the first spanning the period from 1948 to the mid-1960s during which the rate of surplus value was rising, the second from the mid-1960s to early 1980s where the rate of surplus value does not display any particular trend, and the third phase starting in the mid-1980s with the rate of surplus value rising again until the last years of our analysis; we

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[7]The two indexes could be chained together to give a measure of the rate of surplus value spanning the entire 1948-2007 period.

speculate that they form the onset of the fourth stage that is already in process. Focusing on the common time period of the two estimates, we observe that they display a similar pattern and the rather small difference in the level is attributed to the overestimation (underestimation) of variable capital (surplus value) of the productive services sector (industries 8 to 17 of Table A in the appendix). In fact, ST (1994: 111-3) assumed a uniform wage for the workers in the productive services sector of the economy; this assumption we find in our data (at the industry detail) that gives rise to an overestimation of the wages of productive workers of this sector. In the year 1987, for instance, we found that ST's variable capital of the total productive services sector was higher than ours by 43.1 percent, without accounting for the eating and drinking places as well as the computer related industries.[8] Our estimates show that the rate of surplus value increases rapidly in the 1980s until the last years of our analysis, where we observe a slowdown that resembles that of the mid-1960s and later.[9] In the same figure we also portray the evolution of the rate of surplus value according to Mohun's (2006) estimates.[10]

Figure 5 portrays the evolution of the value composition of capital (C/v) as this is captured by the ratio of net fixed capital stock (C) to variable capital (v).[11] The two estimates display approximately the same shape. The stagnant value composition of capital in the 1980s is explained by the rapid devaluation of capital which led to an increase in the rate of profit during the same time period. The rising trend of the value composition of capital, when seen from the early 1980s, signifies the capital-bias technological change and the rapidly rising trend which inevitably will lower profitability.

The value composition of capital shows the degree of mechanization and the state of technology in an economy, while the rate of surplus value shows the distribution of income and also allows us to account for the allocation of surplus value produced in different spheres of social reproduction, and therefore it gives an estimate of the size of the unproductive activities and the limits of their expansion. Furthermore, the value composition of capital in combination with the rate of surplus value determine the general rate of profit defined as the ratio of total surplus value to total capital advanced. In Figure 6 below, we juxtapose ST's estimates of the general rate of profit (R) spanning the period 1948 to 1989 to our estimates for the 1964 to 2007 period.

As we explained, our estimates follow and extend ST's methodology to more recent years using more detailed data consistent with the theory of productive/unproductive labor classification of industries and activities. Furthermore, in the denominator of the rate of profit, we use the net fixed capital stock as is used in similar studies.[12] It is interesting to note at this juncture that Shaikh (1999) has argued that for the estimation of the (general or net) rate of profit it is better to use the gross instead of net capital stock. The idea is that the measurement of depreciation is often of dubious quality and potentially may give rise to certain biases in the estimation of net capital stock, and therefore the rate of profit. The trouble with this suggestion is that the data for gross capital stock are not readily available and so we had no choice but to use net capital stock bearing in mind the potential for biases.

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[8]According to Mohun (2005: 807) ST's overestimation of variable capital in the total productive services sector of the economy for the year 1988 amounts to 69.4 percent.

[9]The growth rates of the rate of surplus value as well as the other variables for selective time periods are displayed in Table 1 below.

[10]Simon Mohun kindly provided his data set for the rate of surplus value of the U.S. economy from his 2006 paper. Mohun's (2006) estimates differ from ours not only in terms of detailed data, but also from the different definitions of value-added and variable capital (see also footnote 4).

[11]The data for the net fixed capital stock are from the BEA and refer to current-cost net stock of private non-residential fixed assets and government enterprises (www.bea.gov/bea/dn/faweb).

[12]For the source of our data for net capital stock see footnote 11.
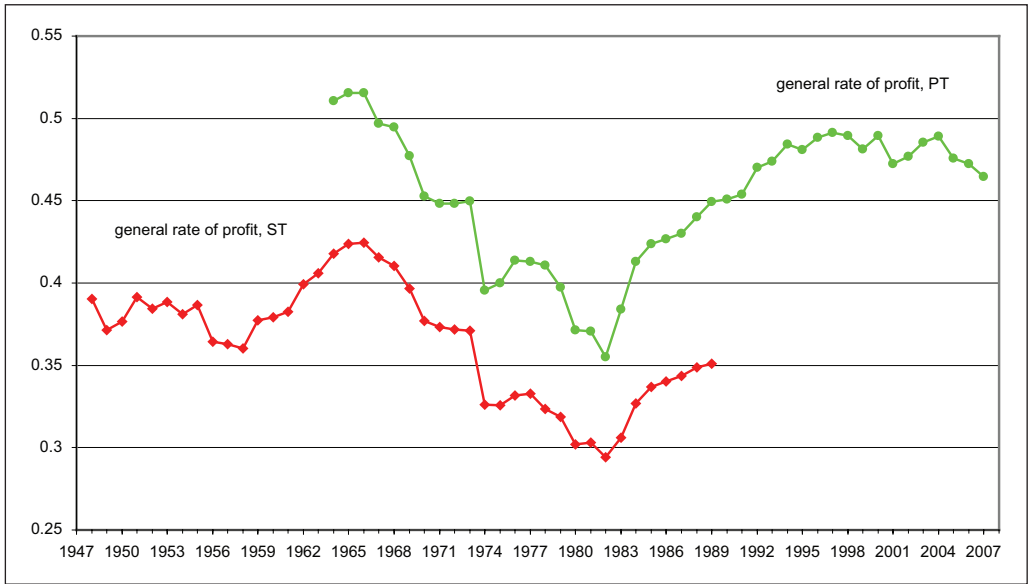
Figure 6. The movement of the general rate of profit

Inspection of the trajectories of the general rate of profit reveals in the case of ST's data the period of the golden age of accumulation, that is the period after World War II until the mid-1960s, and from then on the fall in the rate of profit, which signifies the so-called silent depression that lasted until the early or mid-1980s. We observe (Figure 6) that the general rate of profit replicates ST's estimates for the common time period (*i.e.*, 1964-1989) and then the rising trend signifies the potential for high growth rates in the economy. In fact, the general rate of profit displays a peak in the period 1997 (49.11 percent)-2004 (48.92 percent), that is 31 to 38 years after the previous peak in 1966 of the golden age of accumulation; a result which is absolutely consistent with the thesis of the tendential fall in the general rate of profit.

Turning our attention to the net rate of profit in Figure 7 below, we observe that over the entire period 1948-2007 the net rate of profit (*r*) displays a falling tendency.[13] We distinguish the various stages of this evolution over the 59 years of our analysis. Certainly, in the years up until the mid-1960s the net rate of profit, although displaying a slightly falling tendency, nevertheless remains at high levels, and given the rising general rate of profit the economy kept growing at a healthy pace (the annual growth rate of productivity was 3.60 percent). Thus, it comes as no surprise that this time period has been characterized as the "golden age of accumulation." From 1965 until the early 1980s the net rate of profit plunges to historical lows (the trough is in 1982), and this period is characterized as the "silent" or "contained depression." It is important to note that this fall in the net rate of profit is accentuated by a similar fall in the general rate of profit (see the data of Table 1). More specifically, from the mid-1980s until the mid-2000s the trend in the net rate of profit is reversed; however one cannot make the case for a vigorous rising trend, as for instance that of the years prior to the mid-1960s and certainly the level of the rate of profit is far below that of the 1960s. In fact, in the year 1997 the rate of profit is about 64 percent of the peak rate of profit of the year 1966. It is important to note that there are similar findings in a

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[13]For the estimation of the net rate of profit we subtract from total GDP the wages of general government, the various imputations, total employment compensation adjusted for the self-employed, net indirect business and corporate income taxes. The result of this subtraction is the net profits which, divided by net capital stock, give the net rate of profit of the economy.
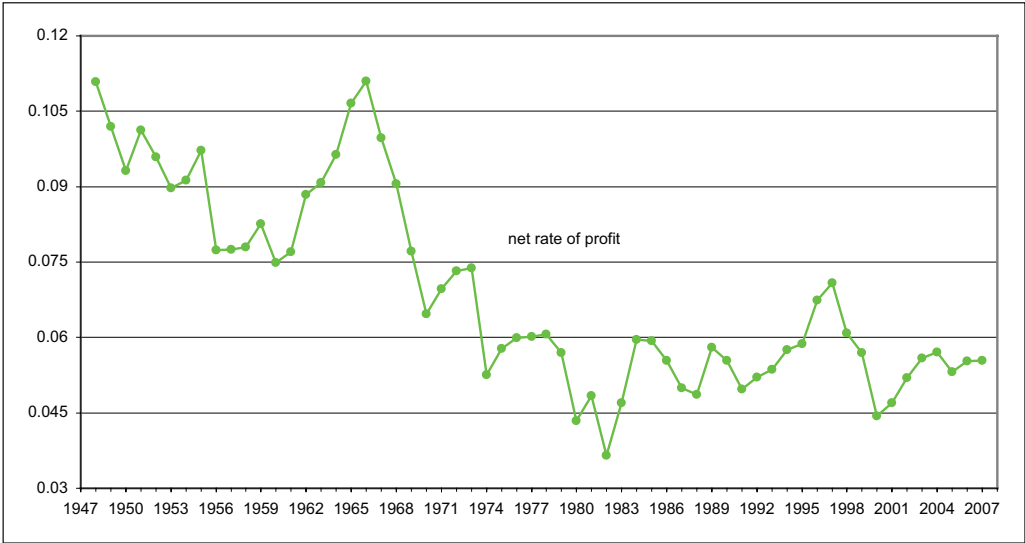
Figure 7. Net rate of profit of the U.S. economy, 1948-2007

Table 1. Annual Growth Rates[15]

Variables/ Periods	Authors	1948- 1965	1965- 1982	1982- 1989	1982- 2007	1948- 1989	1964- 1989	1964- 2007
RSV	ST	1.25	0.26	1.52	-	0.89	0.56	-
RSV	PT	-	0.49	3.03	1.64	-	1.13	1.12
RSV	SM		0.09	2.78	-	-	0.79	-
y	ST	3.60	2.50	2.42	-	2.94	2.19	-
y	PT	-	1.40	2.59	1.96	-	1.79	1.76
y	SM		1.15	2.29	-	-	1.54	-
w	PT	-	0.20	−0.03	0.15	-	0.28	0.26
C^p/v	ST	0.76	2.41	−0.99	-	1.15	1.26	-
C/v	PT	-	2.69	−0.33	0.56	-	1.65	1.34
C/v	SM		2.60	−0.44	-	-	1.55	1.48
R	ST	0.48	−2.14	2.51	-	−0.26	−0.70	-
R	PT	-	−2.20	3.37	1.08	-	−0.51	−0.22
R	SM		−2.50	3.57	1.22	-	−0.65	−0.25
r	PT	−0.23	−6.29	6.60	1.67	−3.80	−2.03	−1.29
ΔC/C	PT	3.28	3.88	2.36	2.61	4.22	3.63	3.17

number of other studies according to which the rate of profit is far below, usually 50 percent to 75 percent, of the peak level of the mid-1960s (e.g., Moseley 2001; Mohun 2006; Duménil and Lévy 2004).[14] We cannot say the same thing though for the general rate of profit, whose rising trend after 1982 is vigorous enough and approximates the level of the mid-1960s (see the growth rates of these variables in Table 1).

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[14]The differences in the various estimations of the rate of profit depend mainly on the treatment of the self-employed population, depreciation, imputations, and taxation.

[15]The estimates of productivity, value composition of capital, and general rate of profit of Simon Mohun (SM) are based on data from Mohun (2006).

Clearly, the net rate of profit never returns to the level of the mid-1960s, and so some Marxist authors have argued for a long-lasting downturn (Moseley 1997; Brenner 2006). The truth, however, is that the level of the net rate of profit in and of itself is not enough to determine the investment behavior of capitalists, because the mass of real profits and its growth are what count. A low rate of profit on a large base (capital) may give higher profits than a higher rate of profit on a smaller base (capital). Furthermore, a falling net rate of profit may not discourage capital accumulation because of a number of factors among which expectations figure prominently as a determining factor of investment behavior. In Marx, expectations are not subjective, as in the Keynesian analysis, but rather derive from the movement of the general rate of profit which signifies the general health of the system. Thus, it is possible for the general rate of profit to rise and the net rate of profit to fall and, at the same time, the accumulation process may continue uninterrupted. In terms of our estimates displayed in Table 1, we observe that during the period 1948-1965 the general rate of profit rises by an annual rate of 0.48 percent, the net rate of profit falls by an annual rate of -0.23 percent, and the annual growth rate in productivity is 3.6 percent, while capital accumulates at the annual rate of 3.28 percent.

In an overall appraisal of the movement of the net rate of profit, we derive that it is shaped, to a great extent, by the movement of the general rate of profit. A rising general rate of profit is absolutely consistent with a falling net rate of profit and a state of vigorous economic growth. For example, the fall in the net rate of profit in and of itself does not imply a phase-change in accumulation, which will occur only if the fall in the general rate of profit leads to a persistent fall in the net rate of profit and to a stagnant mass of profits rendering investment activity redundant (overaccumulation) signifying the onset of crisis. This usually takes a long period of time, a long wave we would say, in the sense that one phase of accumulation takes a considerably long period of time, which depends on a number of factors varying from the replacement of fixed capital to the intensity with which the fixed capital depreciates, the institutional framework which is set up nationally and internationally, and so forth.

4. Two Phase-Changes

The above causal relationship between the rate of profit, the mass of real net profits, and the manifestation of economic crisis is usually lost in the writings of many modern Marxist economists. For example, Foley argues that the fall in the rate of profit may be accompanied by a fall in the accumulation rate. This of course is not welcome by the capitalists but, at the same time, it does not lead to a crisis which is associated with the disruption of the accumulation process. In other words, Foley does not recognize in the fall in the rate of profit any systematic mechanism that leads to a crisis (Foley 1986: 153; Duménil and Lévy 1993: 231).[16]

The work of Shaikh (1992), however, explicitly recognizes the systematic relationship between the net profit rate (r), the mass of real net profits (π), 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 result can be cast starting with the simplified formula of the rate of profit (r), as the ratio of the mass of real net profits (π) to capital stock (C), that is

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

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[16]This is certainly true to the extent that the rate of profit falls gradually and not sufficiently enough. Cases such as the one described by Foley (1986), i.e., falling rate of profit with the potential of continued but slower accumulation process, have been investigated thoroughly using a variety of falling rate of profit scenarios in Mariolis (2010).

By taking differences we write,

$$\Delta\pi = r\Delta C + C\Delta r$$

And dividing through by ΔC and we get

$$\frac{\Delta\pi}{\Delta C} = r + \frac{C}{\Delta C}\Delta r$$

Factoring out r, we have

$$\frac{\Delta\pi}{\Delta C} = r\left(1 + \frac{\Delta r}{\Delta C}\frac{C}{r}\right)$$

The term $\Delta\pi/\Delta C$ indicates the way in which profits change with every change of capital stock or the change in profits for each unit of investment ($I=\Delta C$). The process of accumulation is disrupted when we arrive at the point of a stagnant mass of profits, which is equivalent to saying that the change in profits for each unit of investment remains the same so the extra investment (capital accumulation) becomes redundant. The necessary condition is attained when the elasticity of the rate of profit, that is the term ($\Delta rC/\Delta Cr$), is equal to -1, which is equivalent to saying that the percentage change in the fall in the rate of profit ($\Delta r/r$) is exactly matched by a rise in capital accumulation ($\Delta C/C$), a condition requiring a persistently and sufficiently falling rate of profit.[17] As the economy reaches this tipping point the motivation for new investment fades away, because any profits from new investment are offset, on average, by the fall in the rate of profit, thereby holding the mass of profits stagnant. The persistent lack of new investment and the rising unemployment rate form the two characteristic phenomena of depression.[18] 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 a slowdown in investment activity, and only if the rate of profit is falling sufficiently enough and for a stretched period of time will the mass of profits stagnate and the economy display the phenomena of crisis.

In Figure 8 below we display the natural logarithm of the net profits expressed in constant prices of the year 2005. We observe that the mass of real net profits in the U.S. economy stagnated during the period between the mid-1960s to the mid-1980s. This time period is known as the "silent depression" in the sense that the effects of a depression (such as high unemployment and business bankruptcy rates) were not fully unfolded. The reason is that the presence of institutions and, in general, government intervention moderated the adverse effects of the disruption of the accumulation process on employment. As a consequence, the crisis was manifested through a slowdown in investment activity, relatively high unemployment rates, and inflation. Our data are consistent with the view of the end of a long expansion phase of the early or mid-1980s and the onset of a long period of slowdown in investment activity and the associated phenomena of rising unemployment and mounting public and private debt.

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[17]We rule out the trivial case of $r=0$ (Tsoulfidis 2010: ch.5). It is interesting to note that Marx in *Capital III* (p. 251) discusses the case of such a tipping point.

[18]Heilbroner (1993) notes that as a rule of thumb, when the unemployment rate exceeds the 10 percent borderline, a recession is converted to a depression. Such borderline unemployment rates were reached for the U.S. economy during the depressions of 1873-1896, 1930s, 1982; the current official unemployment rate, despite its biases, is not far from the 10 percent borderline.
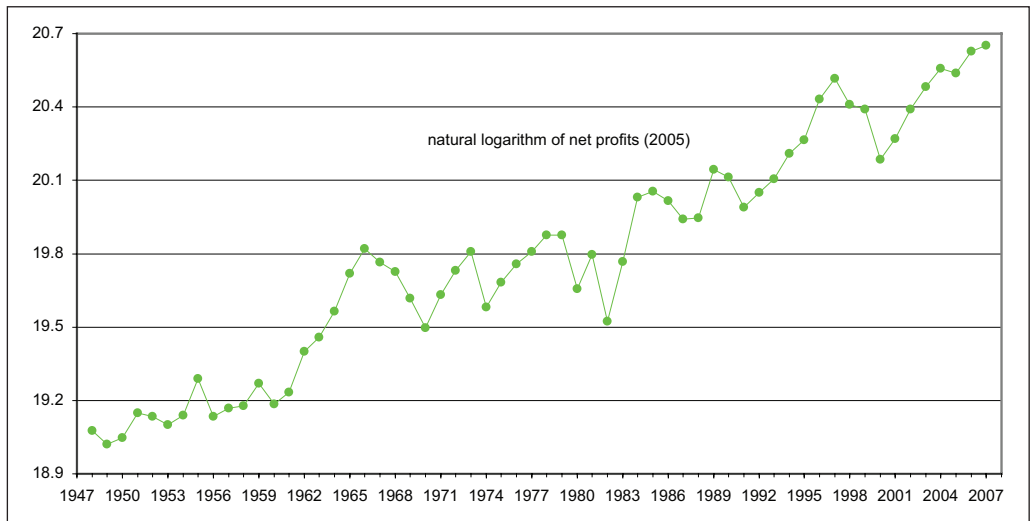
Figure 8. Net real profits in the United States, 1948-2007

6. Summary and Conclusions

In this paper we argued that the distinction between productive and unproductive labor, far from being an issue of semantics, esoteric of Marxian analysis, is of extreme importance for the growth potential of economies. Furthermore, the distinction is crucial in situations of economic crisis, where one wonders about the effectiveness of various economic policies on employment and on the restoration of conditions sufficient for economic growth. Our analysis showed that since the early to mid-1980s the U.S. economy displayed high growth rates that resembled, to a great extent, the performance of the economy in the 1950s till the mid-1960s. Thus this recent period has been rightly characterized as a "new golden age of accumulation." However, this new golden age of accumulation not only shares the basic characteristics of the previous golden age, that is the rising productivity of labor and new technologies, but also significant differences such as stagnant real wages and the expansion of unproductive sectors of the economy, which are choking off its growth potential. During this period the general rate of profit approximated in the late 1990s the general rate of profit in the mid-1960s, while the net rate of profit was rising after the early 1980s, but at a level well below that of the rate of profit of the "golden age of accumulation." The difference in the two rates of profit depends on the unprecedented expansion of unproductive activities. The net rate of profit, although very low, nevertheless was sufficient enough to generate large profits for two reasons: (a) rising capital stock, that even for a smaller net rate of profit gave rise to a larger mass of profits, and (b) policies of keeping low the interest rate especially in the period 2000-2005, combined with rapidly rising productivity (of an annual growth rate about 2.33 percent), led to a rising rate of profit which, nevertheless, remained far below the level of the 1960s, while capital accumulation was going at a rate (3.53 percent) not far from that of the previous golden age of accumulation (see also Table 1).

In retrospect, though, we discover that the new "golden age of accumulation" and the associated "new economy" are inflicted with the same "disease" of the older "golden age of accumulation" and the associated "mixed economy" of the 1960s. The major difference is that during the rising stage of accumulation in the 1950s and 1960s there was a build-up of institutions that formed the so-called welfare state. The presence of these institutions mitigated the destructive effects of the depression that started in the mid-1960s and deepened during the 1970s and early

1980s. More specifically, the rate of unemployment was kept at tolerant levels and the business bankruptcy rate was far lower than that of the 1930s. It is important to note that unlike the depression of the 1930s, when the subsequent recovery was based on demand management policies and the build-up of the welfare state, the silent depression was accompanied by the (partial at least) dismantling of the welfare state, the minimization of the unionization factor, and the withholding of real wages well below the rise in productivity. As a consequence, the restoration of profitability in the 1990s and its maintenance at higher levels because of the artificially kept low interest rates sustained the growing state of the economy until the last years of our study. However, it became evident and begins to show also in the data that this state was no longer sustainable for exactly the same reason that the previous golden stage of accumulation was not, that is, because of the falling rate of profit and the associated stagnant mass of real net profits that discourage investment activity.

Summing up we conclude that every crisis has its own imprint depending on the institutions that are in place. For instance, during the 1930s the prevailing economic philosophy was that of no market intervention, and thus the economic crisis was associated with both high unemployment rates (in the range of 25 percent for the United States and most European countries) and substantial deflation. By contrast, the Keynesian economic philosophy that prevailed in the post-WWII period and the subsequent build-up of the welfare state and the associated creation of a safety net for workers moderated the negative effects of the depression of the 1970s and 1980s over employment and the income of the vast majority of people. The cost of all these was rising inflation, a phenomenon abhorred by free market economists and especially by financial institutions. The expansion of economic activity that followed after the early 1980s was associated with the dismantling of the welfare state and its safety nets and inflation was gradually converted to reflation, which in combination with the provision of low interest rates enhanced profitability, whose long-run falling tendency of course was not reverted as the rate of profit (net or general) did not fully recover the levels of the mid-1960s. The major difference from the previous depression is that the welfare state of the 1970s and early 1980s is no longer in place, although the depression of the 1970s was often blamed on rising real wages, falling labor productivity, and the cost of the welfare state. In the present situation, the real wages remained stagnant or even falling for over three decades and, at the same time, productivity of labor was rising and the emergence of neoliberal ideology in the late 1970s led to the (partial at least) dismantling of the welfare state from the 1980s onwards. These developments reveal beyond any doubt that the causes of the current crisis are to be found in the internal logic of the system oriented towards the extraction of the maximum possible profit as a purpose in itself.

Appendix

The classification of economic activities into productive and unproductive follows that of ST's discussion with some differences which arise from the availability of more detailed data on some industries as well as the changes in the classification system from the SIC (1987) to NAICS (1997). This new accounting system and the availability of data made possible the more consistent with the theory (of productive/unproductive labor) classification of industries than those in the previous system. For example, the trade sector (Wholesale Trade & Retail Trade, SIC codes 50-51 & 52-59) is viewed in principle as unproductive; nevertheless, there are activities, especially those that are near the completion of the product such as cutting and packaging, taking place within the trade sector and are productive. At the same time, there are industries such as Eating and Drinking Places (SIC code 58) which would be classified as productive and in the former system were subsumed in the trade sector with no further information. Thus, for the estimation of productive activities within the trade sector, there was no way other than the adoption

Table A. Classification of Sectors

Productive Activities	Unproductive Activities
1. Farms	21. Wholesale trade
2. Agricultural services, forestry & fishing	22. Retail trade (except eating & drinking places)
3. Mining	
4. Construction	23. Finance, insurance, and real estate
5. Manufacturing	24. Business services (except computer data & processing services)
6. Transportation and public utilities	25. Legal services
7. Eating & drinking places	26. Other services
8. Computer data & processing services	27. Private households
9. Hotels and other lodging places	
10. Personal services	
11. Auto repair, services, and parking	
12. Miscellaneous repair services	
13. Motion pictures	
14. Amusement and recreation services	
15. Health services	
16. Educational services	
17. Social Services	
18. Membership organizations	
19. Government enterprises (federal)	
20. Government enterprises (local)	

of heroic assumptions. For example, Moseley (1985) approximated the number of productive employees in Wholesale and Retail Trade by stipulating that fifty percent of non-supervisory employees employed in the trade sector were productive. On the other hand, ST in principle would agree that some productive labor is employed in the trade sector and in other generally non-productive sectors of the economy; nevertheless, due to the lack of data and also because the results do not change qualitatively and for all practical purposes, they treated this sector wholly as unproductive.

The NAICS treats the Eating and Drinking Places as a separate industry and so we can place it in the productive sectors of the economy. This treatment improves the estimates of all relevant variables, inasmuch as this industry's share in the GDP of the trade sector is relatively high and increases over time. Thus, in 1964, the value added of Eating and Drinking Places was 9.6 percent of the total trade sector, whereas in 2007 this percentage increased to 13.2 percent.

Another industry whose treatment in the past was problematic is the Computer Data and Processing Services, a rapidly growing industry which although productive nevertheless in the previous studies because of the lack of data was classified in the non-productive sectors of the economy. It is important to note that the share of this industry in the GDP of the total private (mainly non-production) business and other unproductive services[19] in the year 1977 amounted to 10.8 percent. Because of the changes in the classifications, the old SIC industry Computer Data and Processing Services is approximated almost 100 percent by the following industries and subindustries in the new system: Computer System Design & Related Services (NAICS code 5415); Software Publishers (NAICS code 5112); Data Processing Services (NAICS code 5142);

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[19]According to SIC 1987, the non-production private services comprise Business Services, Legal Services, Other Services, and Private Households.

and the subindustry Software Reproducing (NAICS code 334611). In order to estimate the share in the value added of these industries and subindustries, we relied on information provided in the benchmark input-output tables of the years 1997 and 2002, the last year that we have such detailed input-output data. In the year 2002 the relative share of so-reconstituted Computer Data & Processing Services was estimated to 18.1 percent. For all the other years we applied inter- and extrapolations. Finally, the classification of various sectors into productive and unproductive is shown in Table A.

Another important feature of our estimations is the number of productive and non-productive workers. We assess the number of productive workers starting with the total number of workers $(L_j)_{\text{NIPA}}$ employed in the productive sectors ($j = 1,2, ..., n$) according to NIPA tables. In this total are included both employed and self-employed. In order to identify the number of the unproductive employees of the productive sectors, we use data from BLS, and for each productive industry j we take the share of productive to the total number of employees, that is $(L_p/L)_j$. Consequently, the number of productive workers in sector j is estimated as follows:

$$(L_p)_j = (L_p / L)_j * (L_j)_{\text{NIPA}}$$

The estimation of variable capital should also include the employer's social security contributions because this is labor cost for businesses. For this purpose, we estimate the ratio of the compensation of productive workers (EC) to the wages and salaries (WS) for each sector. The ratio between those two variables gives us a markup with the aid of which we can estimate the social security contributions:

$$x_j = (EC/WS)_j$$

Subsequently, we multiply the average weekly wage of productive workers (w_j) in each productive sector by x_j in order to estimate in the wage data of the BLS the social security contributions. The so-estimated average wage is multiplied by 52 weeks to get the average annual wage, which multiplied by the total number of productive workers in each sector gives the variable capital in each productive sector of the economy:

$$V_j = (w_j * x_j) * (L_p)_j$$

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