An empirical investigation on the US economic performance from 1929 to 2008[1]

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Abstract

The core of the Marxian theory on economic crises is detected in Marx's theory of the falling profit rate ('The Law of the Tendencial Fall in the Rate of Profit'), owing to the rising organic composition of capital or the decrease of the rate of surplus-value, due to rising real wages ('over-accumulation of capital'). On the basis of this theoretical admission a research on US economic performance from 1929 to 2008 has been undertaken. The findings of this study indicate that US capitalism seems to suffer from a weakness to achieve high profit rates. The recent financial crisis is thus a possibly result of a 'plethora' of profit seeking capitals in the financial sector.

Keywords: US economy; organic composition of capital; over-accumulation of capital; labour productivity; financial crisis

1. Introduction

The fall in the profit rate – owing to the *rising organic composition of capital* or the *decrease of the rate of surplus-value due to rising real wages* – has counterparts in the lack of efficient demand relative to production *(underconsumption)*. These concepts aided Marx in analysing the causal relations and forms of manifestation of the economic crises. However, it is important to distinguish which of these concepts constitutes the decisive structural relation of economic crisis.

In this study it is supported that the decisive structural relation of capitalist economic performance is the profit rate, while the 'underconsumption' is only a secondary manifestation of the economic crisis. Using the net fixed capital return as an indicator of the Marxian profit rate, the investigation demonstrates that the variations of the net fixed capital return of the US nonfinancial corporate business sector from 1929 to 2008 are mainly, but not exclusively, determined by the variations of the real wages (average labour compensation in terms of our research). The rising composition of capital (the intensity of net fixed capital in our research) also affects the net fixed capital return. Since any increase of average labour compensation or net fixed capital intensity could be counterbalanced by increases in labour productivity the latter becomes the crucial factor behind the tendency of the net fixed capital return. Thus, we are in disagreement with Marxist interpretations that focus exclusively on one of the two main components of the falling profit rate, i.e. rising of organic composition of capital versus rising real wages.

Our findings show that the net fixed capital return of the US nonfinancial corporate business sector has recovered after the 1966-1982 crisis. However, it cannot reach the historical levels of the mid-1940s and mid-1960s. After a brief research it

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was concluded that the recent financial crisis is a possible result of a 'plethora' of the profit seeking capitals in the financial sector. Under crisis conditions the capitalist state faces a crucial dilemma. The destruction of less productive capitals is a condition for a dynamic economic recovery and for the violent overthrow of capitalism itself. Economic policy aims to avoid the risk of massive capital destruction.

2. The Marxian theory of economic crises: the law of the tendencial fall in the rate of profit'

Crises are characterised by a 'plethora of capital',[2] that is an overproduction of capital. The latter 'means... overproduction of means of production (...) that can function as capital'.[3] The function of capital presupposes the ensuring of a profit rate which corresponds to 'the "healthy" and "normal" development of the capitalist production process'.[4] This profit rate is the *'usual profit rate'*.[5] 'The usual rate of profit need not be thought of as one definite figure, no more and no less... Once the rate of profit goes below the usual range, a curtailment of operations on the part of capitalist will set in'.[6] Thus, the realisation problem (underconsumption) is merely a consequence of the profitability problem and a 'form of appearance' of crisis:[7] the curtailment of operations on the part of the capitalist class, once the rate of profit goes below the usual range, appears 'in the form of unsold (consumption and investment) commodities'.[8] Inasmuch as 'the branches producing means of production appear as *preliminary stages of the production of means of consumption*', crisis starts as overproduction of means of production, but manifests itself also as overproduction of means of consumption, which is the directly perceivable 'form of appearance' of crisis.[9] However, Marx's work is rather ambiguous on the issue of underconsumption. For example, in the 3rd Volume of *Capital* there are extracts that favour an underconsumptionist interpretation of economic crises.[10] On the base of this underconsumptionist interpretation the first Marxist controversy over economic crises was developed.[11]

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[2] Karl Marx, *Capital*, Vol. 3 (London: Penguin Books, 1991 [1894]), p. 359.
[3] Ibid., p. 364.
[4] Ibid., pp. 359, 364.
[5] Karl Marx, *Theories of Surplus Value* Part II, (London: Lawrence & Wishart, 1969 [1905-1910]), p. 494.
[6] Paul M. Sweezy, *The Theory of Capitalist Development: Principles of Marxian Political Economy* (New York and London: Modern Reader Paperbacks, 1970 [1942]) p. 142.
[7] Nikolai Bukharin, *Imperialism and the Accumulation of Capital*, in Rosa Luxembourg and Nikolai Bukharin *Imperialism and the Accumulation of Capital*, edited by Kenneth J. Tarbuck (London: Allen Lane, The Penguin Press, 1972 [1925]), pp. 151-270, 208-209, 227-228; Milios et al., op. cit., pp. 177, 188.
[8] John Milios, Dimitri Dimoulis and George Economakis, *Karl Marx and the Classics: An essay on value, crises and the capitalist mode of production* (Aldershot - Burlington USA - Singapore - Sidney: Ashgate, 2002), p. 159.
[9] Nikolai Bukharin, *Imperialism and the Accumulation of Capital*, in Rosa Luxembourg and Nikolai Bukharin *Imperialism and the Accumulation of Capital*, edited by Kenneth J. Tarbuck (London: Allen Lane, The Penguin Press, 1972 [1925]), pp. 208-209, 227-228. See also Milios, et al., op. cit., pp. 177, 188.
[10] Marx, *Capital*, Vol. 3, op. cit., pp. 352-353, 615.
[11] Milios et al., op. cit., chapter 8.

2.1.   *Organic composition of capital*

Developing his theory of *'The Law of the Tendencial Fall in the Rate of Profit'*,[12] Marx attempted at first to show that technological innovation – introduced into production by the individual capitalist in the context of economic competition in order to increase the labour productivity, and so the rate of surplus-value – could be the cause of a tendencial fall in the profit rate for the capitalist class as a whole.

Marxian analysis is based on the concepts of technical composition of capital (the quantity in material terms of means of production per unit of living labour) and value (or organic) composition of capital (the ratio of constant to variable capital, in value terms).[13] In the 3rd Volume of *Capital* Marx began his analysis on the tendencial fall in the profit rate supporting that: 'it has been shown [in the 1st Volume of *Capital*][14] to be a law of the capitalist mode of production that its development does in fact involve a relative decline in the relation of variable capital to constant, and hence also to the total capital set in motion'.[15] Given that the technical composition of capital increases with accumulation and technological innovation, Marx maintained that if all other factors remain constant, a fall in the profit rate may emerge if the value composition of capital increases, due to a more rapid increase in the technical composition than the labour productivity it creates.[16]

Considering that the rate of profit is a dependent variable (p´) we may write:

$$p' = \frac{s}{C+v} = \frac{s/v}{C/v + 1} \quad (1)$$

where s = surplus value, C = constant capital, v = variable capital, s/v = rate of exploitation (rate of surplus-value) and C/v = value (organic) composition of capital.

If the technical composition of capital increases more rapidly than the labour productivity, the C/v rises.[17] In all cases where this increase is more rapid than the increase in the s/v (an increase following technological progress, as the latter, by increasing labour productivity, lowers the price of the – constant or slightly variable – real wage) the profit rate falls.[18]

The Marxian analysis does not exclude the possibility of the containment or reversal of the tendencial fall in the profit rate: the tendencial fall is active to the degree that the organic composition of capital rises and 'all other factors remain constant'.[19] Marx analysed these 'other factors' in chapter 14 ('Counteracting Factors') of the 3rd Volume of *Capital*.[20] Moreover, in chapter 5 ('Economy in the Use of Constant Capital')[21] Marx also analysed the factors which cause a fall in the value of constant capital and thus raise the profit rate. Among these factors the nodal ones are: 'the concentration of means of production and their employment on massive

[12] Marx, *Capital*, Vol. 3, op. cit., pp. 317 ff.

[13] Ibid., pp. 241 ff; Milios et al., op. cit., p. 145

[14] Karl Marx, *Capital*, Vol. 1 (London: Penguin Books, 1990 [1867]), p. 776

[15] Marx, *Capital*, Vol. 3, op. cit., p. 318.

[16] Ibid., pp. 317 ff.

[17] Giorgos Stamatis, *Introduction to Political Economy* (Athens: Hellinika Grammata [in Greek], 1997), pp. 65 ff.

[18] Milios et al., op. cit., p. 146.

[19] See ibid., pp. 146-147.

[20] Marx, *Capital*, Vol. 3, op. cit., pp 339 ff. See also Milios et al., op. cit., pp. 147, 196 ff.

[21] Marx, *Capital*, Vol. 3, op. cit., pp. 170 ff.

scale', the formation of 'the combined collective worker' and the 'advances in the area of intellectual production, i.e. the natural sciences and their application'.[22]

Nevertheless, many Marxists ignored 'all the other factors' which Marx considered constant in his analysis, applying the scientific principle of *'ceteris paribus'*.[23] The first Marxist who formulated such an interpretation, in the late 1920s and early 1930s, was Henryk Grossmann. According to Grossmann, in the process of capitalist development, '[w]ith a further increase in the organic composition, there must be a time when any continuation of accumulation will be impossible. This is the Marxian law of collapse'.[24] Thus, Grossmann's approach gave the Marxian theory a 'mechanistic' and 'determinist' interpretation, converting it into a 'theory of collapse' of capitalism.[25]

However, the interpretation of crises on the basis of the rising organic composition of capital was adopted later on by other Marxists, such as Maurice Dobb (1937) and Ernest Mandel (1980) in a non-determinist and non-mechanistic version.[26] Dobb established a relationship between profit rate fall due to the rising organic composition of capital and profit rate fall due to the squeeze of the surplus-value rate (see below), linking the two main causes of the tendencial fall in the profit rate.[27] Mandel incorporated the Marxian theory of the tendencial fall in the profit rate due to the rising organic composition of capital in his theory of 'long waves'. He theorized the 'downturn' long waves of capitalist development as 'endogenous' and the 'upturn' as been influenced by 'exogenous' economic and social parameters which stem from the class relation of forces in the field of a historical social formation. Thus he supported that the technical innovations (if not counterbalanced by 'exogenous' factors) must always tend to increase the organic composition of capital, at least after they have been generalised in the economy. According to Mandel, there is 'a basic asymmetric rhythm in the long waves of capitalist development in which the downturn (the passage from an expansionist long wave into a depressive own) is endogenous, whereas the upturn is not, but rather is dependent on those radical changes in the general historical and geographic environment of the capitalist mode of production that can induce a strong and sustained upturn in the average rate of profit'.[28]

The first theoretician who subjected to criticism the Marxian theory of the tendencial fall in the profit rate due to rising organic composition of capital was Tugan-Baranowsky.[29] Marx's theory was also criticised in the post World-War II era

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[22] Ibid., pp. 170-181.
[23] Milios et al., op. cit., pp. 147-148.
[24] See Henryk Grossmann, *Aufsätze zur Krisentheorie* (Frankfurt/M: Verlag Neue Kritik, 1971), pp. 28-29.
[25] See also Milios et al., op. cit., pp. 148-149; Chris Harman, 'The slump of the 1930s and the crisis today', *International Socialism*, Issue 121 (January), 2009, http://www.isj.org.uk/?id=506
[26] See also Milios et al., op. cit., p. 149. For a relative literature reference to some other non-determinist and non-mechanistic Marxist interpretations of crises see ibid, p. 157.
[27] See Maurice Dobb, *Political Economy and Capitalism. Some Essays in Economic Tradition,* (London: Routledge & Kegan Paul, 1968 [1937]), pp. 79-126.
[28] Ernest Mandel, *Long Waves of Capitalist Development* (London - New York: Verso, 1995 [1980]), p. 42. For a short critique of Mandel's approach see Milios et al, op. cit., pp. 203-204.
[29] Mikhaylo Ivanovych Tugan-Baranowsky, 'Studies on the Theory and the History of Business Crises in England', Part I: 'Theory and History of Crises', in Paul Zarembka (ed.) *Research in Political Economy, Vol. 18: Value, Capitalist Dynamics and Money* (New York: JAI, An Imprint of Elsevier Science, 2000 [1901]), pp. 53-110, 81-108.

on the basis of the 'Okishio theorem', formulated by Nobuo Okishio,[30] who reached similar conclusions as those of Tugan-Baranowsky. According to these criticisms the introduction of technological innovations results in a rise and no a fall in the profit rate, and thus that the Marxian theory is logically flawed.[31] The basis of these criticisms was that in the 3rd Volume of *Capital* Marx developed his theory under the assumption that all constant capital wears out in each production process. In doing so, Marx actually studied the 'cost efficiency' instead of profit rate. Marx thought that the trend of the 'cost efficiency' coincides with that of the profit rate. However, this is not so.[32] Okishio like Tugan-Baranowsky saw the real wage as constant, and studied the trend in the 'cost efficiency' resulting from the introduction of labour-saving *and* cost-reducing techniques. Both concluded that the 'cost efficiency' must rise as result of the relative increase in the capital/labour ratio. However, the Tugan-Baranowsky analysis and the Okishio theorem concern the 'cost efficiency', not the rate of profit. So even on the presupposition of stable real wages, although it is true that the 'cost efficiency' necessarily rises in every case of the introduction of technologies which lower costs, the profit rate may still – depending on circumstances – either rise, remain constant or fall. Consequently, the Marxian theory is logically sound.[33]

2.2.　　　　　Over-accumulation of capital

In his previous analysis Marx has considered the numerator of the fraction of equation (1) as constant (given rate of surplus-value), and he investigated the effect of a rise in the organic composition of capital in the depended variable (profit rate). In the 3rd section of the 15th chapter of the 3rd Volume of *Capital*, 'Surplus Capital alongside Surplus Population',[34] Marx, using the *'ceteris paribus'* method, studies the influence of s/v on p´ by considering C/v as a constant quantity. Here we find his theoretical notion of the 'over-accumulation of capital'.

'Overproduction of capital [...] is nothing more than over-accumulation of capital. [...] There would be an absolute overproduction of capital as soon as no further additional capital could be employed for the purpose of capitalist production... i.e. appropriation of surplus labour, production of surplus-value, of profit. Thus as soon as the capital has grown in such proportion to the working population that neither the absolute labour-time that this working population supplies nor its relative surplus labour-time can be extended (...); where, therefore... the expanded C+ΔC will not produce any more profit, or will even produce less profit, than the capital C did before its increase by ΔC. In both cases there would even be a sharper and more sudden fall in the general rate of profit, but this time on account of a change in the composition of capital which would not be due to a development in productivity, but rather to a rise in the money value of the variable capital on account of higher wages and to a corresponding decline in the proportion of surplus labour to necessary labour'.[35]

Marx argumentation is that the changes in the surplus-value rate are due to the lack of additional workers (very low unemployment rate) and to subsequent increases

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[30] See Nobuo Okishio, 'Technical Changes and the Rate of Profit', *Kobe University Economic Review* 7 (1961), pp. 86-99. For a short presentation of Okishio's theorem see Milios et al. op. cit, pp. 152-154.

[31] See ibid., pp. 150, 152.

[32] Ibid., pp. 150, 155.

[33] Milios et al., op. cit., pp. 152-153, 154-156. For the recent debate on the issue see also ibid., pp. 154, 159.

[34] Marx, *Capital*, Vol. 3, op. cit., pp. 359 ff.

[35] Ibid., pp. 359-360.

of (real) wages. Nevertheless, the surplus-value rate depends also on other factors. The absolute labour-time does not depend exclusively on the number of workers, but also on the length of the working day, which is an external relation with regard to the examined internal economic determinations. The relative (surplus) labour-time (that is the rate of exploitation) does not only depend on the wages, but also on the increase in labour productivity, which is regarded as an unchangeable factor, like the value (organic) composition of capital. Consequently, Marx's 'omissions' have to do with the scientific method of abstraction.[36]

'How are the relations corresponding to a "healthy" movement of capitalist production to be restored?' Marx answered: 'Under all circumstances... the balance will be restored by capital's lying idle or even by its destruction […] The elements of fixed capital are more or less devalued […] Stagnation in production make part of the working class idle and hence places the employed workers in conditions where they have to accept a fall in wages... The fall in prices and the competitive struggle… impel each capitalist… to create an artificial surplus population. The devaluation of the elements of constant capital, moreover, itself involves a rise in the profit rate. ... The stagnation in production that has intervened prepares the ground for a later expansion of production – within the capitalist limits'. And he concluded: 'And so go round the whole circle once again... the same cycle of errors is pursued once more'.[37]

However, Marx supported that crises incorporates the possibility of the violent overthrow of capitalism:[38] 'The violent destruction of capital... as a condition of its self-preservation, is the most striking form in which advice is given it to be gone and to give room to a higher state of social production... these regularly recurring catastrophes lead to their repetition on a higher scale, and finally to its violent overthrow'.[39]

3. A short review of the recent Marxist debate on economic crises

In the mid-1960s the profitability started to have a globally common trend: that of decline (Shaikh)[40]. The initial causes of this decline became the subject of a theoretical debate.

As noted above, the profit rate is the decisive structural relation of capitalist economic performance, while underconsumption is only a consequence and not the cause of an economic crisis. Hence, a review is made on contemporary theoretical Marxist approaches that focus on the fall of the profit rate due to the rising organic composition of capital or the squeeze of the surplus-value rate.

Weisskopf[41] analyses the extent to which the above mentioned variants affects the profit rate of the US economy from 1940 to1975. According to Weisskopf, the organic composition of capital is of minor importance during this period, since the technical composition of capital increases less than the labour productivity it creates.

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[36] Milios et al. op. cit., pp. 195.

[37] Marx, *Capital*, Vol. 3, op. cit., pp. 362-364.

[38] We owe this point to Savas Michael-Matsas remarks.

[39] Karl Marx, *Grundrisse*, (London: Penguin Books, 1981 [1939]), pp. 749-750.

[40] Anwar Shaikh, 'Explaining the Global Economic Crisis', *Historical Materialism*, Vol. 5 (1999), pp. 103-144.

[41] Thomas E. Weisskopf, 'Marxian Crisis Theory and the Rate of Profit in the Postwar U.S. Economy', *Cambridge Journal of Economics,* Vol. 3 (December 1979), pp. 341-378.

According to Glyn and Sutcliffe,[42] since the mid-1960s the rising labour strength affects negatively the surplus-value rate and the profit rate. Weisskopf[43] supports that this labour strength is actually the development of the trade unions and the working class influence on government policy.

In the same theoretical direction with Weisskopf, Wolff,[44] based on a research from 1947 to1976, finds an explanation for the US profitability impasse on the profit squeeze. However, the core of each argument differs. Wolff seems reluctant to accept that there is a profit decline due to the increasing labour strength, i.e. an increasing working class influence on the government policy. Wolff focuses on two variants, labour productivity and wages, in order to find an explanation for the fall of the profit rate after 1967. During 1967-1976, the real average compensation decreases slightly as a portion of this decrease was offset by increased social security. Norsworthy, Harper and Kunze support that this decrease would have caused a raised profit rate if labour productivity had not fallen.[45] Consequently, according to these approaches the profit fall was primarily a result of the slowdown in labour productivity growth. According to Weisskopf et al.[46] the labour productivity decline was attributed to increasing worker - management friction, an outcome of the changing US labour market conditions.

In a later work, Wolff ascribes the rising profitability in US economy since the early 1980s, 'to a rise in the profit share in national income, a slowdown in capital-labour growth at the industry level, and employment shifts to relative labour-intensity industries'.[47]

Vis-à-vis Weisskopf and Wolff's profit squeeze explanation, Moseley[48], addresses the question of why the US profit rate recovery was so weak after the 1970's despite the inexistence of the working class power. According to Moseley, the poor economic performance can be ascribed to the increase of the composition of capital and the shift of the ratio of unproductive to productive labour in favour of the former. The first refers to the Marxian theory of the tendencial fall in the profit rate due to the rising organic composition of capital, a common view among many Marxist researchers (e.g. Freeman[49], Harman[50], Carchedi,[51] Michl,[52] among others). The

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[42] Andrew Glyn and Robert Sutcliffe, *British Capitalism, Workers and the Profits Squeeze* (London: Penguin, 1972).

[43] Weisskopf op. cit.

[44] Edward N. Wolff, 'The Productivity Slowdown and the Fall in the US Rate of Profit, 1947-76', *Review of Radical Political Economics*, Vol. 18 (1&2) (1986), pp. 87-109.

[45] J. R. Norsworthy, Michael J. Harper and Kent Kunze, 'The Slowdown in Productivity Growth: Analysis of Some Contributing Factors', *Brookings Papers on Economic Activity*, Vol. 2 (1979), pp. 387-421.

[46] Thomas E. Weisskopf, Samuel Bowles and David M. Gordon, 'Hearts and Minds: A Social Model of U.S. Productivity Growth', *Brookings Papers on Economic Activity*, No. 2 (1983), pp. 381-441.

[47] Edward N. Wolff, 'What's Behind the Rise in Profitability in the US in the 1980s and 1990s?', *Cambridge Journal of Economics*, Vol. 27, No. 4 (2003), pp. 479-499, p. 479.

[48] Fred Moseley, *The falling Rate of Profit in the Postwar United States Economy* (New York: St. Martin's Press, 1992); Fred Moseley, 'The United States Economy at the Turn of the Century: Entering a New Era of Prosperity', *Capital & Class*, 67 (1999), pp. 25-47; Fred Moseley, 'The decline of the rate of profit in the postwar US Economy: A comment on Brenner', *Historical Materialism*, 2000, http://www.mtholyoke.edu/~fmoseley/Working_Papers_PDF/HM.pdf.

[49] Alan Freeman, 'What makes the US Profit Rate Fall?', MPRA Paper No. 14147 (March) 2009, http://mpra.ub.uni-muenchen.de/14147/.

[50] Chris Harman, 'The rate of profit and the world today' *International Socialism*, Issue 115 (July), 2007, http://www.isj.org.uk/?id=340.

[51] Guglielmo Carchedi, 'The return from the grave, or Marx and the present crisis', http://www.scribd.com/doc/17174428/Carchedi-G-Return-From-the-Grave

second is based on a Marxist version of the productive labour assuming that the production of value and surplus-value is materialized through the production of new use-values from a material aspect. Accordingly, the labour employed in trade and more generally in capitalist enterprises in the service sector is unproductive labour. This is of crucial importance as the cost of unproductive labour increases constantly after 1970, counterbalancing any decline in the capital composition and any increase in the exploitation ratio. Shaikh and Tonak,[53] Mohun,[54] Kidron[55] and Harman[56], among others, accepting the same basic notion of productive labour, have pointed out that the growing 'non-productive' portion of the economy is a main factor of the falling profit rate (for a critique see below).

Besides the above researches, there are works which approach the issue on a global level (Brenner[57], Howard & King[58], etc). Brenner's original[59] work has been the core of debate, despite the absence of a coherent theoretical scheme for the profit rate trends.[60] His explanation of the decline of the profit rate in the US manufacturing sector through the international competition (US, Germany and Japan) in the 1970s and 1980s resulted in the 'Smithian error' – 'that a fall in one sector's rate of profit can drag down the general rate of profit'.[61] Moreover, accepting the 'Okishio theorem',[62] Brenner shifts his explanation of the profit rate fall to the rise of real wages,[63] although he 'rejects the profit squeeze explanation'.[64] According to Mosley, Brenner 'seems to suggest that real wages in nonmanufacturing must have increased very significantly during this period, in order to not only offset the positive effects of the decline of the rate of profit in manufacturing [i.e. the cheapening of inputs for nonmanufacturing], but also to cause an actual decrease in the rate of profit in nonmanufacturing'[65]

4. Assumptions for an empirical investigation

We have supported that the core of the Marxian theory of economic crisis is detected in the falling profit rate. It has been also noted that there is a great dispute as to which

[52] Thomas R. Michl, 'Why Is the Rate of Profit Still Falling?', *The Jerome Levy Economics Institute Working Paper* No. 7 (September 1988). http://www.levy.org/pubs/wp7.pdf

[53] Anwar Shaikh and Ertugrul Ahmet Tonak, *Measuring the Wealth of Nations* (Cambridge University Press, 1994).

[54] Simon Mohun, 'Distributive Shares in the US Economy, 1964-2001', *Cambridge Journal of Economics,* Vol. 30, num. 3 (2006), pp. 347-370.

[55] Michael Kidron, 'Failing Growth and Rampant Costs: Two Ghosts in the Machine of Modern Capitalism', *International Socialism*, Issue 96 (winter) 2002, http://pubs.socialistreviewindex.org.uk/isj96/kidron.htm.

[56] Chris Harman, 'The rate of profit and the world today', op. cit.

[57] Robert Brenner, 'The Economics of Global Turbulence', *New Left Review* 229 (1998), pp. 1- 264; see also Robert Brenner, *The boom and the bubble: The US in the World Economy* (New York: Verso, 2002).

[58] Michael Charles Howard & J. E. King, *A History of Marxian Economics* (Princeton: Princeton University Press, 1992).

[59] Brenner, 1998, op.cit.

[60] Shaikh, op.cit.; Moseley, 2000, op.cit.; Alex Callinicos, 'Feature Review: The Boom and the Bubble: The US in the World Economy Robert Brenner (Verso, 2002)' *New Political Economy,* Vol. 8, No. 3 (November 2003), pp. 419-425.

[61] Shaikh, op.cit., p. 136.

[62] Shaikh, op.cit.; Moseley, 2000, op.cit.; Callinicos, op.cit.; Freeman, op.cit.

[63] Shaikh, op.cit. p. 136.

[64] Callinicos, op.cit., p. 421.

[65] Moseley, 2000, op.cit.

of the two options of the falling profit rate is valid in Marx's theory (rising organic composition of capital or rising real wages).

Let us attempt to investigate this theoretical question in the US economy for the period 1929-2008.

Net fixed capital return is used as an indicator of the Marxian profit rate.[66] Net fixed capital return is a modified equation of the Marxian profit rate equation:

Net Fixed Capital Return = (Net Product - Labour Compensation)/Net Fixed Capital.[67]

According to Duménil and Lévy, such an index 'is appropriate in an analysis *à la Marx* of the trend of the profit rate, focusing on technology and distribution'.[68] The equation numerator demonstrates the distributional relation (profits vis-à-vis wages). The equation denominator focuses on technological development, which is mainly expressed through net fixed capital volume rather than fixed capital, total constant capital or total capital (i.e. constant capital plus variable capital). Technological inovation affects, *ceteris paribus*, the labour productivity, which is the crucial counteracting factor of the fall of the profit rate. As a result, the focus on the net fixed capital facilitates the theoretical research on the causes of economic crises.

More formally, net fixed capital return (r) is expressed by the following equation:

$$r = \frac{Y - L}{K} \quad (2)$$

where Y = net value added (net product), L = labour compensation, Y-L = net operating surplus (profit),[69] and K = net fixed assets (net fixed capital). Equation (2) is a modified version of the Marxian equation (1).

The data refers to the US nonfinancial corporate business sector, which includes the total of private (non-state) US economy, without the financial sector.[70] The latter redistributes the (new) value and surplus-value (net product and profit) but does not produce any (new) value (net product) or surplus-value (profit). According to Marx, 'the ownership titles to joint-stock companies are genuinely titles to real capital. … They give only a legal claim to a share of the surplus-value they

[66] See Elias Ioakeimoglou and John Milios, 'Capital accumulation and profitability in Greece (1964-2004)', *Theseis* (in Greek), No. 91 (April - June 2005), pp. 33-66.

[67] Duménil and Lévy use fixed capital instead of net fixed capital; see Gérard Duménil and Dominique Lévy, *The Economics of the Profit Rate*, (Aldershot U.K. and Vermont U.S.A.: Edward Elgar, 1993); Gérard Duménil and Dominique Lévy 'The profit rate: Where and how much did it fall? Did it recover? (USA 1948-2000)', *Review of Radical Political Economics,* Vol. 34, No. 4 (2002), pp. 437-461; Gérard Duménil and Dominique Lévy, 'The field of capital mobility and the gravitation of profit rates (USA 1948-2000)', *Review of Radical Political Economics,* Vol. 34, No. 4 (2002), pp. 417-436; Gérard Duménil, and Dominique Lévy, 'The Real and Financial Components of Profitability (USA 1948-2000)', *Review of Radical Political Economics*, Vol. 36, No.1 (2004), pp. 82-110.

[68] Duménil and Lévy, 'The profit rate: Where and how much did it fall? Did it recover? (USA 1948-2000)', op. cit., p. 442.

[69] Bureau of Economic Analysis (BEA), *Concepts and Methods of the U.S. National Income and Product Accounts*, 'Chapter 1-5', October 2009, http://www.bea.gov/national/pdf/NIPAhandbookch1-4.pdf.

[70] SIC Division Structure in Occupational Safety and Health Administration (OSHA gov.), United States Department of Labor, *SIC Division Structure*, http://www.osha.gov/pls/imis/sic_manual.html.

represent'.[71] At the same time 'the accumulation of these securities expresses… an expansion of the actual reproduction process… [b]ut as duplicates that can themselves be exchanged as commodities… they are illusory and their values can rise and fall quite independently of the movement in value of the actual capital to which they are titles'.[72]

Our estimation excludes the net fixed capital return of capitalist state enterprises that produce commodities, producing new value and surplus-value (net product and profit).[73] This is a restriction of our analysis.

Although the analysis is realized in terms of price and profit, it is presupposed that price and profit are expressions of value (and surplus-value).[74]

For the estimation of net fixed capital return of the US nonfinancial corporate business sector:

(a) It is supported that: 'from the standpoint of the capitalist production process, 'productive labour' is the labour paid from variable capital. Correspondingly, 'production' from the standpoint of the capitalist production process is any process in which labour-power is exchanged for capital. Thus a 'physiocratic explanation of productive labour'[75] and 'production', according to which the Marxian notion presupposes the production of new use-values from a material aspect, is rejected. The Marxist bibliography reflects a theoretical contradiction in Marx's work. In the *Grundrisse*, as in the 1st Volume of *Capital*,[76] Marx clearly considers the capital in all sectors of economy equally productive: 'Insofar as circulation itself creates costs, itself requires surplus labour, it appears as itself included within the production process. [...] Circulation can *create value* insofar as it requires fresh employment (...) in addition to that directly consumed in the production process'.[77] Nevertheless, in the 3rd Volume of *Capital*, Marx regards the capital in the commodity circulation process as unproductive: 'Commercial capital [...] creates neither value nor surplus-value'.[78] Many Marxist theoreticians embrace the latter viewpoint, drawing the corresponding conclusions in relation to wage-earners employed in trade and more generally in capitalist enterprises in the service sector. As shown above, Moseley, Shaikh & Tonak, Mohun, Kidron and Harman (among others), accepting such a 'physiocratic' notion of productive labour, argue that the augmentation of 'unproductive labour' is a major factor of falling profit rate. Espousing the first of Marx's two analyses,[79] it is

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[71] Marx, *Capital*, Vol. 3, op. cit., p. 608.

[72] Ibid.

[73] Guglielmo Carchedi, *On the Economic Identification of Social Classes* (London: Routledge & Kegan Paul, 1977), pp. 129-130.

[74] Milios et al. op. cit., p. 119.

[75] Apostolos Dedoussopoulos, 'Capitalism, Simple Commodity Production and Merchant Capital: The Political Economy of Greece in the 19th century' (PhD dissertation, University of Kent at Canterbury, 1985, pp. 42, 79).

[76] Marx, *Crundrisse*, op. cit, Marx, *Capital*, Vol. 1, op. cit.

[77] Marx, *Crundrisse*, op. cit., pp. 524, 548.

[78] Marx, *Capital*, Vol. 3, op. cit., p. 395.

[79] For a review of the contradictions within Marxian theory and among Marxists in relation to the concept of productive labour see, among other works, Stephen A. Resnick & Richard D. Wolff, 'Classes in Marxian Theory', *Review of Radical Political Economics*, Vol. 13, No. 4 (1982) pp. 1-18, 6-10.

assumed that the nonfinancial capitalist[80] services (e.g. capitalist commercial activities) produce new exchange values and surplus-value (net product and profit), although they do not produce new use-values from a material aspect – i.e. the labour hired by the nonfinancial capitalist enterprises of services is 'productive labour'. Consequently, all the magnitudes related to the capitalist nonfinancial service production are included in our research.

(b) All kinds of nonfinancial-non-capitalist private enterprises are also included in our research. These are the enterprises of 'independent' producers 'who employ no labourers and therefore do not produce as capitalists', but which 'working with their own means of production, not only reproduce their labour-power but create surplus-value'.[81] These producers, either employed in services or in anywhere else, come under the Marxian thesis that: 'they confront me as sellers of commodities, not as sellers of labour, and this relation therefore has nothing to do with the exchange of capital for labour; therefore also it has nothing to do with the distinction between *productive and unproductive labour*, which depends entirely on whether the labour is exchanged for money or for money as money as capital. They therefore belong neither to the category of *productive* nor of *unproductive labourers*, although they are producers of commodities'.[82]

Transforming equation (2) we have the following three equations:

$$r = \frac{\dfrac{Y-L}{N}}{\dfrac{K}{N}} \quad (3)$$

$$r = \frac{1 - L/Y}{K/Y} \quad (4)$$

$$r = \frac{1 - \dfrac{L/N}{Y/N}}{\dfrac{K/N}{Y/N}} \quad (5),$$

where N = magnitude of employment in the nonfinancial corporate business sector (hired labour plus self-employment), and

$\dfrac{Y-L}{N}$ = average profit

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[80] For a definition of a capitalist type enterprise see George Economakis, 'Definition of the Capitalist Mode of Production: A Re-examination (with application to non-capitalist modes of production', *History of Economics Review*, No. 42 (Summer 2005), pp. 12-28.

[81] Karl Marx, *Theories of Surplus Value* Part I, (London: Lawrence & Wishart, 1978 [1905-1910]), p. 407.

[82] Ibid.

$1 - \dfrac{L}{Y}$ = profit share of income

$\dfrac{K}{N}$ = intensity of net fixed capital, or the net fixed capital per employee, which resembles to the Marxian composition of capital

$\dfrac{L}{Y}$ = labour share of income

$\dfrac{K}{Y}$ = ratio of net fixed capital to income, which expresses the ability of capitalists to make economy in the use of fixed capital[83]

$\dfrac{L}{N}$ = average labour compensation

$\dfrac{Y}{N}$ = labour productivity

Since the US nonfinancial corporate business sector is considered as an articulation of capitalist and non-capitalist enterprises, the number of self-employed must be incorporated in the total number of employment. Thus, for the estimation of N it is assumed that:

$$N = N_{\text{FulltimeEquivalent}} + N_{\text{Self-Employment}}$$

Accordingly, N includes the sum of the full-time equivalent employees plus self-employment.

The official data give the total compensations of employees. Thus, in the calculation of L two issues emerge. The first one is whether the compensation of the chief executives is a labour wage, as it appears in the statistical data. The second one is the estimation of the labour compensation of the self-employed.

Given the above, for the calculation of L it is assumed that:

(c) The chief executives belong to the bourgeois class. According to Poulantzas '[t]he directing agents who directly exercise… powers [of capital] and who fulfill the "functions of capital" occupy the place of capital, and thus belong to the bourgeois class even if they do not hold formal legal ownership'.[84] Consequently, a part of the chief executives compensation is profit and not a labour wage.

(d) The labour compensation of the self-employed tends to be equal to a rather low equivalent of the labour wage obtained by wage-earners. According to Marx, '[t]he only absolute barrier he [the self-employed] faces […] is the wage that he pays himself, after deducting his actual expenses'. He produces 'as long as the price of the product is sufficient for him to cover this wage; and he often does so down to a physical minimum'.[85]

After facing the following problems additional assumption have been made:

(e) The number of the chief executives and their earnings is not known for the whole period under investigation. Comparing the top income fractiles[86] of all the wage-earners with the compensation of chief executives for 1998-2007,[87]

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[83] John Milios, *Modes of Production and Marxist Analysis* (Athens: Hellinika Grammata [in Greek], 1997), p 189.

[84] Nicos Poulantzas, *Classes in Contemporary Capitalism* (London: NLB, 1975), p. 180.

[85] Marx, *Capital*, Vol. 3, op. cit., p. 941-942.

[86] Thomas Piketty and Emmanuel Saez, 'Income Inequality in the United States, 1913-2002', November 2004, http://emlab.berkeley.edu/users/saez/, table A1.

[87] Occupational Employment Statistics (OES), http://www.bls.gov/oes/2007/may/oes_dl.htm.

it is found that the top 0.5% of all employees earns more than the average compensation of the chief executives. Consequently it is inferred that the 0.5% of the total employees belongs, in any case, to the category of the chief executives, assuming that this percentage holds for the whole period under investigation. Since the income levels data do not exclusively refer to the nonfinancial corporate business sector, it is assumed that there is no differentiation in the percentage of the chief executives sector employment. Considering the chief executives income above the average labour compensation as profit it is subtracted from L. Accordingly, it is assumed that a part of the chief executives earnings is a labour wage and not a profit. This compensation is equal to the average compensation of the sector and is added to L. As a result the Marxian analysis is followed: the capitalist 'obtains surplus-value not because he works as a *capitalist* but rather because... he *also* works. This part of surplus-value is therefore no longer surplus-value at all but rather its opposite, the equivalent for labour performed'.[88]

(f) Assuming that the self-employed compensation tends to be equal to a rather low equivalent of the wage of the wage-earners, 10% of the highest labour incomes is subtracted from the total labour compensation and divided the residual sum by corresponding $N_{FulltimeEquivalent}$. Thus, the 'wage equivalent' of the self-employed is equal to the average compensation of the wage group from 0-90% of the labour-income range.[89] The product of 'wage equivalent' and $N_{Self\text{-}Employment}$ is the total self-employed compensation.[90]

5. Analysis of empirical results

In our attempt to investigate which variable – according to the transformation of the profit rate equation (5) – affects mostly the fluctuations of the profit rate, an econometric analysis has been made.[91] We performed ordinary least squares on a model where the dependent variable was net fixed capital return and the independent variables were labour productivity, average labour compensation and net fixed capital. The estimated parameters of the model substantiate the importance of labour productivity and labour compensation on the profit rate. During the examined period, 1929-2008, these two variables appeared to be of crucial importance indicating an over-accumulation crisis interpretation of falling trends of net fixed capital return. Thus, the falling r (as an expression of the falling profit rate) can be seen mainly as the combined result of the relationship between Y/N and L/N. However, the importance of the composition of capital in capitalist economic performance (as expressed through K/N) is also significant. The effect of the variations of the K/N in r is the combined result of the relationship between Y/N and K/N. The final outcome is affected by the combined effect that these three variables have on r. It is from this aspect that, as already noted, we are in disagreement with the Marxist interpretations that focus exclusively on one of the two main components of the profit rate: composition of capital versus real wages. Taking into consideration that this is the

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[88] Marx, *Capital*, Vol. 3, op. cit., p. 506.
[89] Piketty and Saez, op. cit., table A4.
[90] Different treatments can be found in other studies as to the question of the computation of the 'wage equivalent' for self-employed persons; see Duménil and Lévy, 'The profit rate: Where and how much did it fall? Did it recover? (USA 1948-2000)' op. cit., Shaikh and Tonak, op. cit.
[91] For a detailed analysis, see Economakis et al., op. cit.

general trend of the examined period, our further emphasis will be laid on the analysis of each specific upward and downward period.

Figure 1 shows the variations of r of the US nonfinancial corporate business sector from 1929-2008. The line joining the maximum and minimum value of r fluctuations (giving the general trend during a sub period of years) is estimated using least square linear regression. On the basis of the positive and negative movements of r, the examined period of 80 years has been divided in upward and downward sub periods, which are depicted in table 2. Our periodology corresponds to other researches (Freeman,[92] Harman,[93] Moseley,[94] among others).

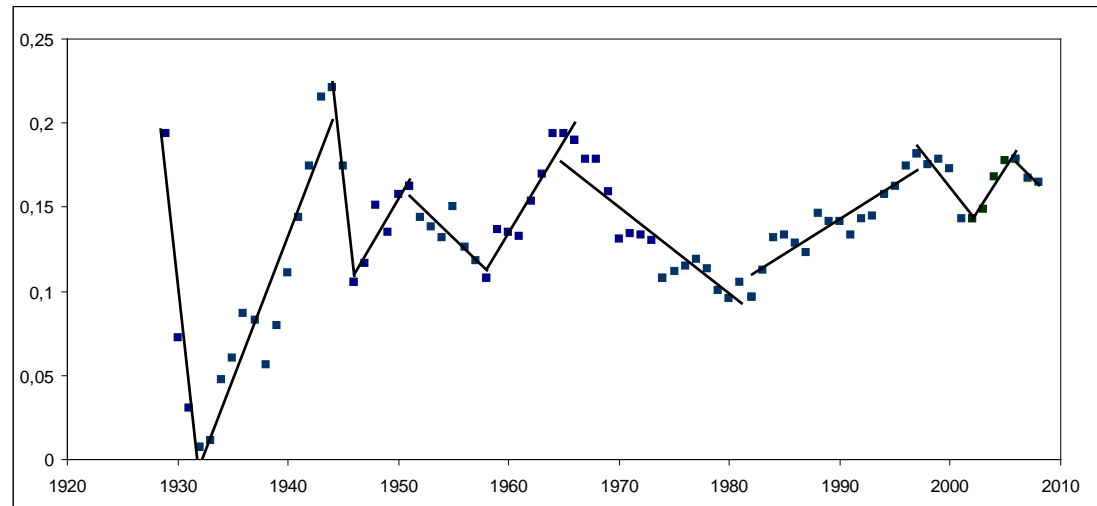**Figure 1: Net fixed capital return of the US nonfinancial corporate business sector (1929-2008)**

Table 1: Upward and downward sub periods (1929-2008) of the US nonfinancial corporate business sector and changes of related variables

	r	Y/N	L/N	K/N	(Y-L)/N	L/Y	K/Y	Y	N	L	K	u*
Upward sub periods												
1932-44	31.14	1.38	0.8	-0.21	24.45	-0.24	-0.67	2.36	0.41	1.55	0.12	
1946-51	0.54	0.27	0.16	0.16	0.79	-0.09	-0.08	0.39	0.1	0.27	0.27	
1958-66	0.76	0.38	0.27	0.07	0.88	-0.08	-0.23	0.58	0.14	0.45	0.22	-0.30
1982-97	0.89	0.18	0.04	-0.05	0.79	-0.12	-0.2	0.62	0.37	0.43	0.3	-0.49
2002-06	0.25	0.1	0.01	0.11	0.38	-0.08	0.01	0.15	0.05	0.06	0.16	-0.21
Downward sub periods												
1929-32	-0.96	-0.21	0.25	0.39	-0.95	0.59	0.77	-0.38	-0.21	-0.01	0.1	
1944-46	-0.52	-0.18	-0.09	0.14	-0.45	0.12	0.39	-0.17	0.02	-0.07	0.16	
1951-58	-0.34	0.17	0.26	0.34	-0.11	0.08	0.15	0.15	-0.02	0.24	0.32	0.65
1966-82	-0.49	0.19	0.3	0.7	-0.14	0.09	0.43	0.53	0.29	0.67	1.19	1.55
1997-02	-0.21	0.06	0.13	0.13	-0.11	0.06	0.06	0.1	0.03	0.17	0.17	0.18
2006-08	-0.08	-0.04	-0.07	0.14	0.05	-0.04	0.18	-0.05	-0.01	-0.08	0.12	0.17

*Unemployment

Table 1 also shows, the changes of the variables that are connected to r during each sub period: the three variables already used in the econometric estimation (Y/N,

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[92] Freeman, 'What makes the US Profit Rate Fall?', op. cit.
[93] Harman, 'The rate of profit and the world today', op. cit.
[94] Moseley, 'The decline of the rate of profit in the postwar US Economy: A comment on Brenner', op.cit.

L/N, K/N), their components parts (Y, K, L, N), and additionally $\dfrac{Y-L}{N}$ (see equation 3), L/Y and K/Y (see equation 4). Each variable changes that affect r is indicative, as the relation of each variable with r in each sub period is intervened by a coefficient. Table 2 also depicts the changes of unemployment during the sub periods after 1950 (available data 1948-2008).[95]

Table 2 shows common patterns in upward and downward sub periods. Starting with the former, it can be seen that the impetus of r increases (positive changes) has to be assigned on Y/N. During these sub periods, Y/N preempts both L/N – thus leading to positive average profits $(\dfrac{Y-L}{N})$ – and K/N (with the exception of the sub period 2002-2006 for the latter). The growth rate of Y/N during the upward period 1932-1944 certifies this pattern at the most. This is the sub period with the highest positive changes of r and of $\dfrac{Y-L}{N}$ and the highest negative change of K/N. The other sub period with negative change of K/N is the recovery period 1982-1997, after the crisis of 1966-1982. According to Wolff (see above), this reduction corresponds to a shift to relative labour-intensity industries, one of the causes of rising profitability since the early 1980s. It could be said that the same explanation applies to the sub period 1932-1944. In any case there is a significant rise in the magnitude of employment (N) in both sub periods. Moreover, both the labour share of income (L/Y) and the net fixed capital to income ratio (K/Y), display negative changes during the upwards sub periods (with the exception of the sub period 2002-2006 for the latter), leading thus to the positive change of r (see equation 4). This means that the rise of the net product (Y) preempts the rise of the labour compensation (L) and of the net fixed capital (K). Since $(1-\dfrac{L}{Y})$ is the profit share of income, the decreases of L/Y imply a rising profit share during the upwards sub periods. Additionally, inasmuch as $\dfrac{L}{Y}=\dfrac{L/N}{Y/N}$ and $\dfrac{K}{Y}=\dfrac{K/N}{Y/N}$, the relation between Y/N and L/N and K/N is again the common parameter behind these changes. Hence, the rising labour movement after the Second World War[96] keeps step with the rising labour productivity. In the sub period 1958-1966, where the L/N displays its highest rise, Y/N displays its second highest rise. Especially for K/Y, which denotes the ability of capitalists to economise on fixed capital, it must be noted that, according to Marx, the negative changes express the advances in the area of intellectual production, i.e. the natural sciences and their application, as well as the formation of a skilled 'collective worker'. This is more evident here, since it has been taken into account only the net fixed capital, given that the technological development is mainly expressed through net fixed capital volume. Once again 1932-1944 is the sub period of the highest negative changes of L/Y and K/Y being the period with the highest positive change of Y. However, the negative change of K/Y in 1932-1944, and the high labour productivity, could be ascribed mainly to the massive destructions of old less productive capitals

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[95] Bureau of Labor Statistics, http://www.bls.gov/data/.

[96] Gérard Duménil and Dominique Lévy, 'Costs and Benefits of Neoliberalism', *Review of International Political Economy*, Vol. 8, No. 4 (2001), pp. 578-607, 586.

during the crisis of 1929-1932 and the Second World War.[97] On the contrary, '[t]he favourable features of technical change… were the main factors of the prosperity… during the first decades following World War II'.[98] In the first sub period of recovery after the 1966-1982 crisis (1982-1997) K/Y also displays a negative change. According to Ioakeimoglou the negative change of K/Y in this period could not be ascribed to the introduction of new technologies in production, and to the consequent rise in labour productivity, as this introduction occurs only after 1992-1993. Thus, the negative change of K/Y (and the rise in Y/N) in this period is a possible expression of the destruction of less productive capitals, during the period 1983-1992.[99] Harman supports that '[a]n important change took place in the system from around 1980 onwards – crises begin to involve large scale bankruptcies for the first time since the interwar years'.[100] As seen above 1982-1997 is the other sub period, after 1932-1944, in which K/N also displays a negative change. These reductions were ascribed above

to a shift towards relative labour-intensity industries. Since $\dfrac{K}{Y} = \dfrac{K/N}{Y/N}$, it could be

supposed that the reduction of K/Y and K/N demonstrates a double movement: the destruction of old less productive capitals is followed by a shift towards labour-intensity industries. Taking into account the negative changes of K/N and K/Y in 1932-1944 and 1982-1997 it can be noted that the extent of the destruction of old less productive capitals was greater in the first case than in the second. The last sub period of recent recovery (2002-2006) is the only upward period where the change of K/Y is positive, and both Y/N and Y obtain the lowest changes during the sub periods of

recovery. Additionally, $\dfrac{Y-L}{N}$ obtain the lowest change, even though L/N obtains the

lowest change during the sub periods of recovery. Thus, this is the sub period of recovery with the lowest r. The above indicate a problem in the productive application of new technologies introduced in business in the mid-1990s,[101] and thus in the formation of a skilled 'collective worker'.[102] Consequently a weakness in the continuation of recovery with high profit rates after the 1966-1982 crisis appears. Finally, as is expected by the Marxian theory, unemployment is reduced in upward periods.

In the downward sub periods it can also be seen that the negative changes of r are correlated with the relation between Y/N and L/N and K/N. In this case the Y/N

cannot offset the changes of L/N – and thus $\dfrac{Y-L}{N}$ displays negative changes (with

the exception of last sub period 2006-2008, where the average profit displays positive changes) – and of K/N. The latter indicates that the rise of the K/N is more rapid than the increase in Y/N – that follows technological progress. Moreover, in three sub periods Y/N exhibits negative changes (1929-1932, 1944-1946 and 2006-2008). As a

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[97] Harman, 'The slump of the 1930s and the crisis today', op. cit. and Harman, 'The rate of profit and the world today', op. cit.

[98] Duménil and Lévy, 'Costs and Benefits of Neoliberalism' (2001), op. cit., p. 588.

[99] Elias Ioakeimoglou, *End of the Century, End of the Crisis?* (Athens: Hellinika Grammata [in Greek], 2000), p. 70.

[100] Harman, The rate of profit and the world today', op. cit.

[101] Paul Krugman, *The Returns of Depress Economics and the crisis of 2008*, (New York – London: W. W. Norton & Company, 2009), p. 141.

[102] The neoliberal educational reforms we suppose that are directly connected with this finding. However, this is a question that we do not intend to examine here.

consequence of low levels of labour productivity (in relation to the changes of L/N and K/N), both the L/Y and the K/Y display positive changes (with the exception of the sub period 2006-2008 for the former), contributing to the sagging rates of r, and of profit share of income. The period 1929-1932 (the Great Depression), which is before the highest recovery (1932-1944) is the sub period with the most unfavourable trends for the performance of capital for the majority of the variables. This is the period with the highest negative changes of both r and $\frac{Y-L}{N}$, the highest positive changes of L/Y and K/Y and the greatest diminution of Y. In regard to the fluctuations of r, the sub period 1966-1982 corresponds to the third highest negative change of r. This sub period, the most durable crisis period since 1929, has the highest positive changes among the downward sub periods (the second after 1932-1944) of L/N and of L. Furthermore, among downward sub periods, it includes the highest positive changes of N, while that of K/N and K are the highest for the whole sample. These findings, referring to an over-accumulation crisis and a crisis owning to the rising organic composition of capital, explain why the period 1966-1982 is the starting point of disputes among contemporary Marxists in reference to the causes of crisis. The positive change of Y (the highest among downward sub periods) is perhaps an indicator that during this crisis the powers of destruction of less productive capitals were not delivered. The time span of available data for the beginning of the recent crisis (2006-2008) is very short to exact valid conclusions. However, it is noteworthy that this sub period is the only downward period in which the Y/N offsets the change of L/N (the diminution of the Y/N being less than the diminution of L/N), and thus $\frac{Y-L}{N}$ displays positive change. It is also the only downward sub period in which the L/Y displays negative change. The neoliberal 'direct confrontation with the worker movement and unions',[103] the defeat of labour movement in relation to the augmentation of unemployment, the diminution of N and the highest among all the sub periods decrease in L outline some explanatory aspects of these findings. The problem in the productive application of new technologies, already detected from the sub period of recovery 2002-2006, is probably the main cause for the beginning of the crisis. Finally, as is expected by the Marxian theory unemployment is augmented in downward periods.

Table 2: Net fixed capital return of the US nonfinancial corporate business sector, selected years

	1929	1932	1944	1946	1951	1958	1966	1982	1997	2002	2006	2008
r	0.194	0.007	0.221	0.106	0.163	0.108	0.190	0.096	0.182	0.143	0.178	0.165

From table 2 it can be seen that r obtains its highest price (0.221) in 1944, after its lowest price (0.007) in 1932; it obtains the second highest price in 1966 (0.190) and the third highest price in 1997 (0.182). Finally, r obtains the fourth highest price in 2006 (0.178). Thus, after the recovery that followed the Great Depression and the Second World War, r never reaches such a high price. On the contrary, every highest point of r is lower than the previous one over the 80 years period.[104]

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[103] Duménil and Lévy, 'Costs and Benefits of Neoliberalism' (2001), op. cit. p. 587.

[104] Many other Marxist studies come to a similar conclusion in regard of the US non-financial profit rate. For a review of the relevant literature see Chris Harman, 'Not all Marxism is dogmatism: a reply to Michel Husson', *International Socialism,* Issue 125 (January), 2010, http://www.isj.org.uk/?s=contents&issue=125.

According to Harman, 'the combined impact of the interwar slump and the Second World War had already caused a massive destruction of old capital (...). Accumulation was able to restart with higher profit rates than in the pre-war period... Capitalism could enjoy what is often now called its "golden age"'[105] Nevertheless, it seems that the 'fuel' that led capitalism, to its 'golden age' has diminished. Capitalism seems to suffer from a weakness in achieving high profit rates. As seen above, Marx has taught that the 'fuel' for capitalist recovery and expansion of production is primarily the massive capital destruction itself, the extent of which seems to determine the extent of recovery. According to Beitel, '[t]his process of… destruction of technologically-obsolete capital is the necessary precursor to the restoration of a higher rate of profit'.[106] However, Marx supported that a great depression is a condition of a great recovery but it is also a condition for the violent overthrow of capitalism. Capitalist states are aware of this dilemma. 'The economy did not collapse in the 1990s in the way that the US and German economies did in the early 1930s. The state still seemed able to stop that. But it could not lift the economy back to its old growth path, whether by monetarist means, Keynesian means or a combination of the two'.[107]

6. Conclusion

'Just as medical science progresses through pathology, Marxist political economy develops through the analysis of the actual crises of capitalism'.[108] And what can be said about the general evolution of profitability in the US economy is that profit rate cannot be restored to the previous levels of the mid-1940s and mid-1960s. Capitalism appears to suffer from a weakness in achieving high profit rates. Despite the labour movement defeat, the application of new technologies, introduced in business during the mid-1990s, did not lead to a sufficient rise of profitability because this application was not materialized in a sufficiently purged field of less productive capitals. The economic resurgence is a crossword without solution.

Neoliberalism appeared to be the solution to the 1966-1982 crisis. During a period of falling profit rates and rampant inflation '[t]he major event was the change of monetary policy in 1979, the 1979 coup, targeting nearly exclusively monetary policy toward price stability'.[109] This objective was accomplished through the increase of the interest rates[110] – which results in the destruction, to some extent, of less productive capitals, during the period 1983-1992. 'The rise of real interest rates simultaneously contributed to the failure of many institutions (…), while creating very favourable conditions for others. Simultaneously to this rise of financial corporations, non-financial corporations developed their financial activity'.[111] At the same time, a relaxation of the restrictions imposed to the financial sector after the Great Depression

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[105] Harman, 'The rate of profit and the world today', op. cit.

[106] Karl Beitel, 'The Rate of Profit and the Problem of Stagnant Investment: A Structural Analysis of Barriers to Accumulation and the Spectre of Protracted Crisis', *Historical Materialism* 17 (2009), pp. 66-100, 91.

[107] Harman, 'The slump of the 1930s and the crisis today', op. cit.

[108] Joseph Choonara, 'Marxist accounts of the current crisis', *International Socialism,* Issue 123, 2009, http://www.isj.org.uk/?id=557.

[109] Duménil and Lévy, 'Costs and Benefits of Neoliberalism' (2001), op. cit., pp. 586-587.

[110] Ibid., p. 588; see also Benjamin M. Freidman, 'Lessons on Monetary Policy from the 1980s', *The Journal of Economic Perspectives*, Vol. 2, No. 3, (1988), pp. 51-72, 52.

[111] Duménil and Lévy, 'Costs and Benefits of Neoliberalism' (2001), op. cit. p. 600.

of 1929 appeared to be a solution to the economic deadlock and the precursor of the forthcoming economic crisis. The 'Depository Institutions Deregulation and Monetary Control Act'[112] of 1980 and the following 'Garn-St. Germain Depository Institutions Act' of 1982 pave the way for the de-regulation of the financial system and the explosion of the financial sector. The repeal of the 'Glass-Steagall Act' in 1999 was crucial in this direction.[113] According to Ticktin,[114] 'outlets for profitable investment were... restricted' in 'real' economy' and the profit seeking capitals flooded the financial sector. Consequently, '[t]he expansion of finance... has constituted an attempt by capitalists to get rates of profit higher than they could get from productive investment'.[115] According to Duménil and Lévy, '[i]n the US, comparing the 1990s to the 1970s, the ratio of the monetary and financial assets of non-financial corporations to their tangible assets was nearly multiplied by two. These trends are one expression of what has been denoted as "financialization"'.[116] From this point of view the 'financialization' is 'the result… of blockages in genuine accumulation'.[117]

The financial sector explosion can be seen from Figure 2, where it is clear that the deviation between the growth of non-financial and financial profits in favour of the latter increased gradually in the late 1990s. Due to the blockages in genuine accumulation, this sector-deviation resulted in a 'plethora' of the profit seeking capitals in the financial sector and led to the two subsequent bubbles in the US economy[118] in 2001 and 2007: the dot-com and the real-estate bubble. Thus, the recent financial crisis is an 'intensification' of a 'real' crisis.[119] 'Real' and 'financial' non-conformity is further by the rescue movements of the US government with the Paulson's Plans.[120] These Plans further underline the fear of the capitalist state to the powers of the violent destruction of capital.

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[112] Shah Gilani, 'How Deregulation Eviscerated the Banking Sector Safety Net and Spawned the U.S. Financial Crisis', *Money Morning*, January 13, 2009, http://moneymorning.com/2009/01/13/deregulation-financial-crisis.

[113] See 'Critique Notes', *Critique* 46, Vol. 36, No. 3, December 2008, pp. 333-342, 335.

[114] Hillel Ticktin, 'A Marxist Political Economy of Capitalist Instability and the Current Crisis', *Critique* 47, Vol. 37, No. 1, February 2009, pp. 13-29, 27.

[115] Harman, 'Not all Marxism is dogmatism: a reply to Michel Husson', op. cit.

[116] Duménil and Lévy, 'Costs and Benefits of Neoliberalism' (2001), op. cit. p. 600-601.

[117] Marx, *Capital*, Vol. 3, op. cit., p. 639. According to Beitel, '[t]his reallocation of profits from production to finance marks the reassertion of the power and prerogatives of capitalist owners – in particular, that sector of the capitalist class that controls the origination and allocation of credit and finance'. Beitel, supports that this reallocation expresses 'the breakdown of the expected profit-investment relation' is not caused by the absence of profitability: 'One of the puzzles of the performance of the US economy over the last several decades is the failure of the improvement in profitability to translate into a higher rate of net investment'. Based on the 'monopoly-capitalist theory' (the 'monopoly-capital school'), Beitel finds as the farthest cause of the breakdown of the expected profit-investment relation the 'industrial maturity': 'the maturation of the US – and global – industrial system has imposed barriers to accumulation that appear to have largely offset any stimulus due to the improvement in the profit-rate' (Beitel, op. cit., pp. 74, 82-85). Thus, Beitel, justifies Baran and Sweezy's substitution of 'the law of rising surplus for the law of falling profit' (Baran, Paul and Paul Sweezy, *Monopoly Capital: An Essay on the American Economic and Social Order* (New York: Monthly Review Press, 1966), p. 72.

[118] Krugman, op. cit., p. 145.

[119] Marx, *Capital*, Vol. 3, op. cit., p. 649; see also Jack Rasmus, 'Speculative Capital, Financial Crisis and Emerging Epic Recession', *Critique* 47, Vol. 37, No. 1 (February) 2009, pp. 31-49.

[120] See 'Credit Crisis - Bailout Plan', *The New York Times*, Monday, Dec. 10, 2009, http://topics.nytimes.com/top/reference/timestopics/subjects/c/credit_crisis/bailout_plan/index.html.

Figure 2: U.S.: Profit rate of nonfinancial and financial corporations, %

Nonfinancial corporations: (———)
Financial corporations: (-----)

Source: Duménil and Lévy[121]

Without dispute, a great depression can drive the capitalist system into a profitability restore, throughout massive capital destructions. But the (not so) 'invisible hand', found the solution to the Keynesianism and Neoliberalism without leaving the destructive forces to act on the less productive capitals. These political decisions are not made by chance. Massive capital destruction can pave the way for the conditions of the violent overthrow of capitalism, acting as tinder for the proletarian revolution.

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[121] Gérard Duménil and Dominique Lévy, 'Costs and Benefits of Neoliberalism: A Class Analysis', 2005, in Epstein G., Financialization and the World Economy, Edward Elgar : Aldershot, England, http://www.jourdan.ens.fr/levy/dle2005g.htm, figure 11.

Technical appendix

1. Data sources

Our data covers the period 1929-2008. All monetary data are converted into 2000 US dollars.

From the Bureau of Economic Analysis (BEA) 'National Economic Accounts' (op. cit.) we found data for:
- Net value added for nonfinancial corporate business sector in production prices[122] (Y): table 1.14.
- Net Fixed Assets of nonfinancial corporate business[123] (K) from table 6.13.
- Full time Employees of nonfinancial corporate business ($N_{Full\text{-}Time}$): table 6.4.
- Full time Equivalent Employees of nonfinancial corporate business ($N_{FulltimeEquivalent}$) (table 6.5), which equals the number of employees on full-time schedules plus the number of employees on part-time schedules converted to a full-time basis.
- Self-employment of nonfinancial corporate business ($N_{Self\text{-}Employment}$): table 6.7.
- Compensation of employees of nonfinancial corporate business ($L_{employees}$): table 1.14.

From the study of Piketty and Saez, (op. cit) we use the data:
- Average compensation of 0.5% top wage level ($L_{0.5\%}$) from the table A1.
- Average compensation of 0-90% of wage share ($L_{0\text{-}90\%}$) from the table A4.

2. Estimation of Labour Compensation

For the estimation of L we supposed that:

$$L = L_{employees} + N_{Self\text{-}Employment}L_{average\ 0\text{-}90\%} - 0.005\ N_{Full\text{-}Time}L_{0.5\%} + 0.005\ N_{Full\text{-}Time}\left(L_{employees}/N_{FulltimeEquivalent}\right) =$$
$$= L_{employees} + N_{Self\text{-}Employment}L_{0\text{-}90\%} - 0.005 N_{Full\text{-}Time}(L_{0.5\%} - L_{employees}/N_{FulltimeEquivalent})$$

where,

$[L_{employees}/N_{FulltimeEquivalent}]$ stands for the average compensation per employee,

$[L_{average\ 0\text{-}90\%}]$ is the 'wage equivalent' per self-employee,

$[N_{Self\text{-}Employment}L_{0\text{-}90\%}]$ is the total wage compensation of self-employed.

Supposing that chief executives employment is a full-time employment,
$[0.005\ N_{Full\text{-}Time}]$ is the estimated number of chief executives, $L_{0.5\%}$ is the average wage of the higher 0.5% of labour compensation and so
$[0.005\ N_{Full\text{-}Time}L_{0.5\%}]$ is the total income of chief executives.
Finally, $[0.005\ N_{Full\text{-}Time}(L_{employees}/N_{FulltimeEquivalent})]$ is the total wage compensation obtained by chief executives.

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[122] (Gross value added for nonfinancial corporate business) – (Consumption of fixed capital for nonfinancial corporate business)
[123] Current-Cost Net Stock of Private Fixed Assets of nonfinancial corporate business