LUND UNIVERSITY
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Financialization, the Great Recession, and the rate of profit: profitability trends in the US corporate business sector, 1946-2011

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Abstract: The tendential fall in the rate of profit lies in the center of a long-lasting debate among Marxist scholarship on its centrality and empirical relevance in the investigation of structural crises. Without neglecting the financial aspect of the current crisis, which is covered in the vast majority of academic accounts, we try to discover its underlying roots in the entire spectrum of capitalist production in the US, in reference with that debate. Our empirical evidence indicates that the US economy experiences an inability to recover profit rates to the high levels of the first postwar decades on a sustainable basis. It is proposed that this is due to the reluctance of policy makers to allow the vast destruction of unproductive capital, because such a process entails a potential systemic risk for the established socioeconomic and political status-quo.

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List of Abbreviations

ATP – After Tax Profits
ATPR – After Tax Profit Rate
BCTP - Business Current Transfer Payments
BEA – Bureau of Economic Analysis
BLS – Bureau of Labor Statistics
BTP – Before Tax Profits
BTPR – Before Tax Profit Rate
CAGR – Compound Annual Growth Rate
CB – Corporate Business
CC – Current-Cost Net Stock Valuation
CCAdj – Capital Consumption Adjustment
Fed – Federal Reserve System
FCB – Financial Corporate Business
GDP – Gross Domestic Product
GVA – Gross Value Added
HC – Historical-Cost Net Stock Valuation
IVA – Inventory Valuation Adjustment
L – Employee Compensation
LTRPF – Law of the Tendency of the Rate of Profit to Fall
OCC – Organic Composition of Capital
OECD – Organization of Economic Cooperation and Development
NBER – National Bureau of Economic Research
NDI – Net Domestic Investment
NFCB – Nonfinancial Corporate Business
NIP – Net interest payments
NIPA – National Income and Product Accounts
NNI – Net National Income
NOS – Net Operating Surplus
NOSR – Net Operating Surplus Rate
NVA – Net Value Added
TSSI – Temporal Single-System Interpretation
TSVR – Total Surplus-Value Rate

1. Introduction[1]

Structural crises have been the subject of research for many scholars deriving from diverse theoretical backgrounds for a long time. In the Marxist tradition of economic thought, structural crises lie in the center of an ongoing debate, as one of the fundamental issues of Marx's theory. As a theory that attempts to deal with the entire network of socioeconomic relations that develop under the capitalist system of production, Marxian political economy has engaged in a long-lasting debate on the role and the causes of structural crises in the process of capital accumulation. Since profit is the primal goal of any investment in capitalism and the motive power behind capital accumulation, profitability is one of the key concepts when discussing structural crises.

One great structural crisis is also the Great Recession of 2008-2009 and the global economic crisis that followed the outbreak of the 2007-2008 financial slump in the US. This crisis has once more provoked a wide academic and public discussion on both its proximate and ultimate causes. There have only been three other structural crises in the roughly two-and-a-half centuries of capitalist development that can be compared in their extent and severity to the Great Recession; the Long Depression of the 1880s, the Great Depression of the 1930s, and the stagflation crisis of the 1970s. The Great Recession is the biggest in length and output-decline crisis since the Great Depression (NBER, 2013). From the peak in December 2007 to the trough in June 2009 unemployment rates doubled (from 5.0 % to 10.0%) and long-term unemployment is consistently higher than in any other recession period (BLS, 2012).[2] Industrial output, personal income, trade volumes, and stock markets plummeted worldwide. The US economy contracted by roughly 4% during that period as did most high income economies of the Organization of Economic Cooperation and Development (OECD) and the recovery since then has been sluggish and weak compared to post-crisis growth rates of the past (World Bank, 2013). This development can be understood in the globalized market environment that exists nowadays, where economic relations are much stronger than in the past and economies of different countries are much more interdependent. It is also evident by the transfusion of the crisis from the US to the Eurozone in the form of a sovereign debt crisis.

Only few researchers have addressed the question as to why there has been such a drastic structural shift in the US from industrial to financial and banking activities and if that is the reason behind the intensification of the crisis and the growing instability of the economy. The US economy has become highly dependent on credit expansion and imports, and household as well as government debt have risen significantly. Domestic investment in manufacturing, as well as manufacturing as a productive sector, have

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[1] This part draws heavily and builds upon previous work of mine (drafts and paper assignments) submitted in 2012 and 2013 for other courses.
[2] Graphs with descriptive statistics can be found in Appendix A.

declined greatly over the last thirty years. Since the driving force of the US economy is consumption and manufactured goods account for the vast majority of consumer purchases, the trade deficit is increasing throughout this period. The sustainability of this development paradigm on a macro level is threatened by the specific economic conjuncture described above.

For many years, the importance of concepts such as capital accumulation and the profit rate in the study of long-term economic performance has been devalued by the marginalist mainstream that favored the inquiry of psychological, behavioral, monetary, or other micro-factors. The failure of these approaches in predicting and explaining the current crisis reveals the necessity for the revival of macro-oriented approaches with regard to economic growth under capitalism. Considering these facts, it is interesting to examine whether the present crisis has its roots solely in the financial sphere of the economy, or if it is indirectly connected with the long-term economic performance and profitability of the "real" economy.

Most studies about the Great Recession concentrate on the period following the dot-com bubble in 2000, mainly stressing the financial and monetary aspects of it. In the majority of these publications, the crisis is considered an outcome of various exogenous factors and bad policy, thus neglecting endogenous factors that give an explanation on why structural crises constitute a recurrent event in the process of capitalist development. Many analysts argue that this crisis is a result of very low interest rates, vast credit expansion, and extensive debt levels (both public and private) in the period preceding the crisis (Austrian school of economic thought). There are nevertheless explanations of the Great Recession that focus on the proximate causes of its financial dimension and adopt an endogenous or at least institutional approach with regard to the recurrence of economic crises. A brief overview of these theories will be presented in section 3. Nevertheless, our main goal here will be to examine the underlying and not the proximate causes of the crisis.

1.1. Aim, hypothesis, and outline of the thesis

The aim of this research project is to examine if the present crisis has its roots in the long-term profitability performance of the corporate business (CB) and nonfinancial corporate business (NFCB) sectors of the US economy. A declining average rate of profit could indicate that a deep structural crisis in the "real" economy of the US led to capital seeking investments in short-term and/or speculative financial activities, thus causing an over-saturation of interest-bearing capital in the markets and a bubble. In this sense, the goal of this study is to investigate the fundamental factors of this crisis and not the financial, monetary, or policy factors that played the biggest role in maximizing its effects. The credit bubble, the subprime mortgage crisis, and the consequent financial crisis are

considered the epiphenomenon of the crisis and not its cause, which may potentially have postponed the effects of a long-standing structural crisis.

Thus, the hypothesis to be examined is that the Great Recession was caused by an excess of profit-seeking capitals in the financial sector, which is an outcome of problematic profitability in the sphere of production. The theoretical foundations of this hypothesis will be presented in the next section. The simple questions we will try to address are the following: (1) Did the profit rate in the CB and NFCB sectors fall during this period? (2) If so, how much did it fall, did it recover at all, and to what extent in the neoliberal era? (3) Why did it fall/recover/not recover?

In this context, our goal is to calculate several profit rates for the CB and the NFCB sectors, in order to examine their levels, trends, and fluctuations in a long-term perspective and identify if the instability of the US economy is connected with declining returns to capital in the goods-producing sector during the entire postwar period. Therefore, the research question of this thesis can be summarized as follows: Do the different profit rate measures for the CB and NFCB sectors indicate a long-term profitability crisis in the "real" economy, which has led capital seeking alternative outlets of profit in the financial sector of the US economy in the period leading up to the crisis?

The thesis that will be proposed here is that profit rates recovered only partially in the period between 1980 and 1997 and cannot reach their pre-1970s levels, indicating a long-term fragility of the accumulation process in the US economy. It is argued that this process encouraged a glut of unproductive investments in financial and residential assets that favored the creation of bubbles. In our view, the long-lasting incapacity of the US economy to achieve a stable recovery lies in the protectionism of policy makers who have not allowed the vast destruction of unproductive capital in the fear of extreme aftershocks that would endanger the established socioeconomic and political order, as in the case of the Great Depression.

The rest of the paper is structured according to the following plan:

In the second section, the theoretical framework of the formulated hypothesis is presented, which covers Marx's crisis theory in regard to the "Law of the Tendency of the Rate of Profit to Fall", a discussion of historical interpretations of crisis in that tradition, and the criticism to those approaches. The third section comprises of the methodological approach that is followed in the calculation of the data series with a small note on known qualitative and quantitative issues. The fourth section includes an outline of previous research concerning the 1970s crisis and the state of the ongoing debate on profitability and the Great Recession, as well as a brief presentation of the financialization approaches. The fifth section examines the calculated profitability trends and presents the results, and finally the last section offers the conclusion that is drawn from this inquiry.

2. Theoretical framework

2.1. The "Law of the Tendency of the Rate of Profit to Fall"

Marx was not the only, nor the first one, to investigate declining returns to capital. The founders of Political Economy, the classical economists Adam Smith, David Ricardo, and John Stuart Mill had also written about the topic and given their explanations on why profitability would tend to decline in the process of capitalist development, a view which they strongly supported (Milios, Dimoulis, & Economakis, 2002, p. 145). Neither the presentation of their arguments nor the well-established criticism to them lies within the scope and limitations of the present study. It will be attempted to answer the research question from a heterodox point of view, drawing the theoretical background mainly from the Marxian literature on crises and more specifically from Marx's "Law of the Tendency of the Rate of Profit to Fall" (LTRPF). The profit rate is a key variable in Marxian economics that is a crucial determinant of capital accumulation and investment policies, which in turn, largely define the successful reproduction and growth of the economy.[3] The profit rate can generally be described as the ratio of profit flows for a certain period to the advanced capital, fixed and circulating, that was used during that specific period in the creation and realization of this profit. The Marxian equation for the *profit rate (p)* is the following:

$$p = \frac{s}{C} = \frac{s}{c+v} = \frac{s/v}{c/v+1}\,, \tag{1}$$

where the total amount of profit produced in a period, the *surplus value (s)*, is divided by the total amount of capital invested in that period *(C)*, which is the sum of *constant capital (c)* (i.e. plants, machinery, raw materials etc.) and *variable capital (v)* (employee compensation). If we further divide the first equation by *v,* we derive at the final form of equation (1). The *s/v* fraction is the *rate of surplus value* (or *rate of exploitation*) and the *c/v* fraction is the *organic composition of capital (OCC)* in value terms.

According to Marx (1991, Part III, Chapter 13), during the process of capitalist development and increasing competition, there is an endogenous drive for the individual capitalist to introduce new technology in order to raise the labor productivity and thus the *rate of surplus value*. Since technological innovation implies the use of more machinery compared to living labor (means of production per laborer in material terms, i.e. the *technical composition of capital* in Marxian terms or else capital intensity), then *ceteris paribus*, a rise in the *OCC*, which is the denominator in equation (1) would cause a

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[3] *"It is the rate of profit that is the driving force in capitalist production, and nothing is produced save what can be produced at a profit. Hence the concern of the English economists over the decline in the profit rate"* (Marx, 1991, p. 368).

decline in the rate of profit. The same would happen in any case of an increase in the OCC *(c/v)* which is greater than the rise in the rate of surplus value *(s/v)*.

Although, Marx valued this law highly and wrote extensively on it, he acknowledged that the LTRPF is only valid under specific assumptions *(ceteris paribus)* and there are *"counteracting forces"* which come into play and give it a merely tendential rather than an absolute character (Marx, 1991, Part III, Chapter 14). In this context, the declining underlying trend of the rate of profit will only under specific historical conditions, when the system is fragile, produce more generalized crises (Shaikh, 1978a). In other words, the rate of profit will not exhibit a long-standing secular decline. This means that Marx only examines this law using the scientific method of abstraction in order to discover the endogenous dynamic forces that would affect the profit rate if all other independent variables remained constant (Milios et al., 2002, pp. 194-196). In that sense, all exogenous factors that affect the trajectory of an economy in a specific historical, socioeconomic, political, and institutional environment are being neglected in favour of the inherent attributes of capitalist development.

2.2. Marxian theory of crises

Economic crises vary significantly in extent, intensity, general attributes, consequences, and forms of manifestation. The outcome of all these factors depends in every occasion on the specific historical conditions (economic, social, political etc.) and on the given socioeconomic power relations. In that context the present crisis also displays special characteristics that need to be studied in order to compare and contrast them with previous crises and possibly draw conclusions on the underlying causes of structural crises and the mechanisms that lead to their recurrence in the capitalist mode of production. One of Marx's main contributions to the investigation of economic crises is that in his theoretical system, crises are closely related with the process of economic growth and are an endogenous outcome of the contradictory forces that develop during that process. Mainstream schools of economic thought only consider crises to be caused by exogenous factors, but this approach does not provide any theoretical insights on the recurrence of structural crises. In the following passage from the third Volume of *Capital* Marx outlines the innate nature of periodical crises in capitalism:

> *"The periodical devaluation of the existing capital, which is a means, immanent to the capitalist mode of production, for delaying the fall in the profit rate and accelerating the accumulation of capital value by the formation of new capital, disturbs the given conditions in which the circulation and reproduction process of capital takes place, and is therefore accompanied by sudden stoppages and crises in the production process. [...] Capitalist production constantly strives to overcome these immanent barriers,*

but it overcomes them only by means that set up the barriers afresh and on a
more powerful scale" (Marx, 1991, p. 358).

In Marxian analysis all crises are considered as internally and externally generated
temporary shocks and disturbances in the process of capital accumulation and
reproduction that stem from the inherently antagonistic and conflicting nature of
capitalist development (Shaikh, 1978a). Although crises are considered as potential
moments of destabilization of the economy, they also work as a way to restore stability in
the economy through the destruction of unproductive capital, something that gives them a
periodical and temporary character:

> *"[A]t certain points the conflict of contending agencies breaks through in*
> *crises. Crises are never more than momentary, violent solutions for the*
> *existing contradictions, violent eruptions that re-establish the disturbed*
> *balance for the time being"* (Marx, 1991, p. 357).

This can to some extent explain the fact that Marx did not develop a solid "unitary" crisis
theory as a distinct and self-standing theoretical concept as his main task was to examine
the determinative forces in the capitalist economy (Tabb, 2010). Instead his references to
crises are spread throughout his earlier works and are more of descriptive and empirical
character (Milios et al., 2002, p. 158). The following segments describe the situation prior
and during a crisis and could very well be used to describe the situation of the US
economy on the verge of the Great Recession:

> *"The chain of payment obligations at specific dates is broken in a hundred*
> *places, and this is still further intensified by an accompanying breakdown of*
> *the credit system, which had developed alongside capital. All this therefore*
> *leads to violent and acute crises, sudden forcible devaluations, an actual*
> *stagnation and disruption in the reproduction process, and hence to an actual*
> *decline in reproduction [...] On the eve of the crisis, and during it, the*
> *commodity capital is contracted in its capacity as potential money capital. It*
> *represents less money capital for its owner and his creditors (also as security*
> *for bills of exchange and loans) than at the time it was bought and when the*
> *discounts and loans made with it as security were concluded"* (Marx, 1991,
> pp. 363, 622).

However in his more mature economic works, and especially in the 3rd Volume of
Capital and in his *Theories of Surplus Value*,[4] which were both published after his death,

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[4] The third Volume of *Capital* was written by Marx between 1863 and 1883, edited, and completed by
Friedrich Engels, before its first publication in 1894, eleven years after Marx's death. *Theories of Surplus*

he tries to develop his ideas on crises in a more structured theoretical way although his work remains ambivalent on this subject. That has caused a large debate within the Marxist scholars with regard to what is the Marxian theory of crises, or which of the dominant interpretations of Marx's writings is the most insightful on this specific topic. This historical debate on the origin of economic crises, which began at the dawn of the 20th century, continues unresolved up to this day and the Great Recession has sparked yet another series of intellectual conflict among exponents of different versions of Marx's theory. As Natalie Moszkowska aptly put it in 1935 and still holds true: *"In no field of Political Economy is there to be found such a great gap between the different viewpoints as in the investigation of economic crises"* (1935, p. 37).

In some passages, Marx advocates the underconsumption of the working forces as the cause of crises,[5] whereas in most other parts of his work he strongly refutes that view, by considering underconsumption only as an aftereffect of the crisis.[6] His main argument is that the fall in the rate of profit is accompanied by an overproduction of capital (overaccumulation), as an outcome of higher concentration of capital which intends to counterbalance for the tendency of the rate of profit to fall through a higher mass of profits (Marx, 1991, Part III, Chapter 15).[7] So in this case arises the situation that a

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Value is considered as the fourth Volume of *Capital*. It was written between 1862 and 1863 and a first version of the manuscript was initially published in three volumes between 1905 and 1910 by Karl Kautsky. Both books include in these versions rearrangements, modifications, omissions, supplements and corrections to the original text that sometimes distort its meaning and are not considered scientifically accurate, something that has also affected the historical debate on crises (Heinrich, 1996; Milios et al., 2002, pp. 206-214, Chapter 10).

[5] *"The ultimate reason for all real crises always remains the poverty and restricted consumption of the masses, in the face of the drive of capitalist production to develop the productive forces as if only the absolute consumption capacity of society set a limit to them"* (Marx, 1991, p. 615).

[6] In a passage from the second Volume of *Capital* Marx contradicts both the abovementioned underconsumptionist approach as well as the Keynesian view that promotes the lack of effective demand: *"It is a pure tautology to say that crises are provoked by a lack of effective demand or effective consumption. The capitalist system does not recognize any forms of consumer other than those who can pay [...] If the attempt is made to give this tautology the semblance of greater profundity, by the statement that the working class receives too small a portion of its own product, and that the evil would be remedied if it received a bigger share, i.e. if its wages rose, we need only note that crises are always prepared by a period in which wages generally rise, and the working class actually does receive a greater share in the part of the annual product destined for consumption. From the standpoint of these advocates of sound and 'simple' (!) common sense, such periods should rather avert the crisis. It thus appears that capitalist production involves certain conditions independent of people's good or bad intentions, which permit the relative prosperity of the working class only temporarily, and moreover always as a harbinger of crisis"* (Marx, 1992, pp. 486-487).

[7] *"A fall in the profit rate, and accelerated accumulation, are simply different expressions of the same process, in so far as both express the development of productivity [...] a fall in this rate slows down the formation of new, independent capitals and thus appears as a threat to the development of the capitalist production process; it promotes overproduction, speculation and crises, and leads to the existence of excess capital alongside a surplus population [...] The barriers to the capitalist mode of production show themselves... in the way that the development of labour productivity involves a law, in the form of the falling rate of profit, that at a certain point confronts this development itself in a most hostile way and has constantly to be overcome by way of crises [...] Production comes to a standstill not at the point where*

"plethora" of capital seeks higher profits in short-term, speculative investments or even frauds (e.g. Madoff's Ponzi scheme in 2008) in the financial markets which finally leads to economic bubbles and crises (Marx, 1991, pp. 359-360). Thus, our main goal here is to examine if there is a declining trend in the rate of profit of the NFCB sector that may have led to the glut of fictitious capital in the financial sector and to the subsequent crisis.

2.3.   The Law of the Tendency of the Rate of Profit to Fall as the Marxian interpretation of crisis and criticism to it

Marx's LTRPF was first developed and formulated as a Marxian approach to economic crises by Henryk Grossman in the period right before the financial crash and the Great Depression.[8] He thought that in the process of capitalist development the implementation of new technological innovations in the production would lead the OCC to rise at a higher rate than the rate of exploitation. Once the influence of the "counteracting factors" on the law is exhausted, the capitalist system will eventually, through increasingly more intense periodical crises, break down (Grossmann, 1992, pp. 29-32).

It is obvious that Grossmann, alike most of the supporters of the underconsumptionist approach, develops his theory of crisis into a "determinist-necessitarian" "theory of the collapse" of capitalism (Milios et al., 2002, p. 149). Later on, other economists, with Maurice Dobb (1937, pp. 79-126) and Ernest Mandel (1995) being the most prominent among them, accepted the determinative influence of the LTRPF in the emergence of crises but in a "non-determinist" manner, as they were of the view that the law has only temporary power which after the impact of the countertendencies would lead to the restoration of the profit rate to pro-crisis levels (Milios et al., 2002, p. 149). In a similar contemporary account, Carchedi (2011) states that the outcome of the profit rate depends on the interaction between the tendency and its several countertendencies. Mandel (1995) also develops a theory of "long waves" where the LTRPF holds a central position and according to which long-term fluctuations in the rate of profit define the different phases of development. He argues that in the upper turning points of the "long wave" (i.e. the crisis), which precede the depressive phase, as well as during that period (which lasts approximately 20 to 30 years and is of similar duration with the expansionary phase) the economy is characterized by lower profit rates, sluggish rates of growth and accumulation, and high unemployment.

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needs are satisfied, but rather where the production and realization of profit impose this" (Marx, 1991, pp. 349-350, 367).

[8] Grossmann's main ideas on crises can be found in his major work which in English is translated as *The Law of Accumulation and Breakdown of the Capitalist System: Being also a Theory of Crises* (Grossmann, 1929, 1992). For a detailed account of his crisis theory as well as his overall work in relation to Marxist economic theory, politics, and philosophy see also Kuhn (2005, 2009).

In our view this approach is closer to Marx's original writings, it is theoretically more solid, and has proven to be scientifically and empirically more accurate in the long run.[9] Furthermore, this approach has the advantage that it can be compared and contrasted with other theories on long waves of capitalist development (long-term), economic cycles (medium-term), and business cycles (short-term) laid out by Kondratieff, Schumpeter, and Kuznets, and extended by Freeman & Perez and Schön in an attempt to draw wider conclusions on secular and temporal trends in profitability and cyclical fluctuations of the economy.[10] However, many of the above mentioned authors concentrate more on the lower turning points and on the mechanisms, endogenous or exogenous, that drive the system out of the depression and into a new expansionary phase, whereas our focus is on the upper turning points, the crises, and the inherent elements of the capitalist economy that produce them.

Grossman's crisis interpretation has received valid criticism from many scholars.[11] Natalie Moszkowska (1935, pp. 45-49) developed a critique of Grossman's concept some years after him, where she claimed that the technologies implemented after World War I would not cause a declining tendency in the rate of profit, but quite the opposite, at least in the long run, because of a simultaneous increase in rate of surplus value and a decrease in the organic composition of capital (as a result of labor productivity increasing faster than the technical composition of capital through these innovations). The weakness of Moszkowska's work was that she did not provide any empirical analysis or data of that period that would justify her theoretical thesis (Milios et al., 2002, p. 149).

The LTRPF as such has received both criticism and support from a broad spectrum of academic scholars on its validity and its centrality for Marxian economics. The most widely known critique of the LTRPF was published in 1961 by the Japanese Marxian economist Nobuo Okishio, who developed an economic model assuming that real wages remain constant and new techniques of production that substitute living labor with machinery are introduced only if they reduce the production cost per unit of output (Okishio, 1961, 1993). Under these assumptions, he asserted that the rate of profit would in every case rise and under no circumstances fall after the implementation of a labor-replacing and cost-cutting technology. Sixty years earlier, another Marxist theoretician,

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[9] One should always bear in mind that Marx's writings should not be interpreted in a "deterministic" way, as his theory is developed as a dialectical approach of the innate dynamics of the capitalist system, whose outcome always varies and depends on the specific historical context (Tabb, 2010). Besides that, the assumption that Marx's work provides the totality of theoretical and methodological tools to assess the current crisis conjuncture is groundless.

[10] See further in Schumpeter and Fels (1939), Kuznets (1940), Kondratieff and Stolper (1935), C. Freeman and Perez (1988), and Lennart Schön (2008) for an explanation of business cycles, long swings, and long waves. The scope and limitations of this paper do not allow for a more detailed presentation.

[11] For a critique to Grossman's "teleological" approach see Milios et al. (2002, pp. 148, 175-176),and Bukharin, in Luxemburg, Bucharin, & Tarbuck (1972, pp. 204, 262-263)

Mikhail von Tugan-Baranowsky, had criticized the LTRPF under similar assumptions as Okishio and had come to similar results concerning the validity of the law (Milios et al., 2002, pp. 150-156; Tugan-Baranowsky, 2000).

The refutation of the LTRPF by the "Okishio theorem" reignited the fuse in the continuing debate among (mainly Marxist) scholars with regard to its validity and produced a new wave of critics and supporters (Roemer, 1981; Shaikh, 1978a, 1978b). The most recent episode in that series of theoretical dispute was sparked by the refutation of the "Okishio theorem" by the proponents of the so-called "Temporal Single-System Interpretation (TSSI)" of Marx's Value Theory and their assertion that the LTRPF is valid and internally consistent. According to this approach the refutation of the "Okishio theorem" lies in the argument that the constant fixed capital stock (net or gross) of any given firm in the economy must be calculated according to its historical-cost (HC) value (the value at the time of purchase) and not by its current-cost (CC) valuation because it is not devalued by future technological advances and increases in productivity that cheapen it or make it impossible to realize all the value that is embodied in it before its replacement (i.e. there is no moral depreciation).[12] To read further on the arguments of the advocates of the TSSI approach see Kliman (1997, 2007); Kliman and Freeman (2000a, 2000b); and Kliman and McGlone (1999). For the arguments of the other side of the controversy, the defenders of the "Okishio theorem", see Foley (2000); Laibman (1999, 2000a, 2000b).

In this paper, our concern is to examine the potential role of the LTRPF in the emergence of crises and not the purely theoretical and mathematical debate that revolves around the law and/or the "Okishio theorem". In our view, the validity of both the LTRPF and the "Okishio theorem" can be mathematically proven on the ground of different assumptions. The essence of the debate nevertheless, has to be sought in how representative and scientifically accurate of the "real-world" conditions of capitalist development these different assumptions are. This discussion is however beyond the boundaries of the present research project. In conclusion, we can say that despite the fact that we do not embrace a dogmatic view according to which Marx was inerrable in everything he wrote, nor do we believe that this specific view has anything to offer to the theoretical strength, credibility, and advancement of Marxian economics, we are totally in agreement with the following statement by Duncan Foley:

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[12] Marx develops the concept of moral depreciation in the first Volume of *Capital*: *"If, as a result of a new invention, machinery of a particular kind can be produced with a lessened expenditure of labour, the old machinery undergoes a certain amount of depreciation, and therefore transfers proportionately less value to the product. [...] But in addition to the material wear and tear, a machine also undergoes what we might call a moral depreciation. It loses exchange-value, either because machines of the same sort are being produced more cheaply than it was, or because better machines are entering into competition with it"* (Marx, 1990, pp. 318, 528).

"The power and usefulness of Marx's analysis of exploitation as the central social relation of capitalist society does not stand or fall on technical details of matrix algebra or difference equations. The notion that technical gaps in Marx's discussion of the transformation problem undermine his theory of exploitation is a line of argument largely advanced by Ricardian and marginalist critics of Marx whose motivation is to discredit rather than to clarify its contribution" (1999, p. 233).

3. Data and method

3.1. Main data sources and basic methodology

The main sources of data are the National Income and Product Accounts (NIPA) and the Fixed Asset (FA) tables, which are produced by the Bureau of Economic Analysis (BEA) of the US Department of Commerce. The primary source of data on profit flows is the BEA's NIPA Table 1.14, which decomposes the Gross Value Added (GVA) produced by the domestic CB and NFCB sectors into its different components. Data on the net stock of private fixed assets stem from the BEA's FA Tables 6.1 and 6.3. These three tables are the main sources used in the empirical analysis, but additional data may be deduced from other sources and will be utilized to account for shortcomings in the BEA data.

The calculations made in order to obtain profit rates and other figures, as well as all the sources of secondary data, will be explicitly presented in Appendix B (Endnotes). This will add to the transparency of the empirical analysis, so that any reader can easily find the data and replicate the calculations to find the same results.

The measures that will be utilized in the empirical analysis as profit rates are in essence different versions of the net fixed capital return, i.e. different profit flow measures divided by the net stock of fixed assets (CC or HC) of the previous year. The figures provided by the BEA for the stock of corporate fixed capital are end-of year estimates, thus we divide the profit flow figure of the given year by the value of the preceding year for the net stock of capital, to extract the profit rate for the given year.

The equation that will be used to calculate these figures can generally be expressed with the following equation:

$$\rho = \frac{\Pi}{K}, \tag{2}$$

where ρ is the rate of profit, Π is the profit flow, and K is the net stock of fixed capital. What distinguishes these different versions is firstly, the variable that is operationalized to account for the profit flows, and secondly, the way the net stock of fixed capital is estimated.

The annual profit rate series will be filtered with the widely acknowledged Hodrick-Prescott (HP) filter, which was initially presented by the two authors in their

famous 1981 article, in order to distinguish the trend and the cyclical component of the time series, which is essential in our analysis (Hodrick & Prescott, 1997).[13] The HP filter is capable of revealing whether the profit-rate time series display a secular trend or whether their movements follow a cyclical pattern through time. For the abovementioned reasons, the HP filter will also be utilized in all other time series dealing with macroeconomic indicators of the US economy. The smoothness of the estimated trend as well as the form of the estimated cycle depend largely on the value of the smoothing parameter λ. Here we will use the commonly accepted values of 100 for annual data and 1600 for quarterly data.

3.2. Qualitative and quantitative methodological issues

The methodological issues that arise in the quest of calculating profit rates and estimating profitability trends for the different corporate sectors are huge and there is no consensus among the scholars who have undertaken such research on which is the optimal definition or measure to be used in analysis. Those issues pertain to both the nominator (profit flows) and the denominator (fixed capital stock) in the equation of the profit rate. The operationalization of the Marxian concepts and variables in terms of economic statistics and national accounts systems is a challenging task.

3.2.1. Current-cost (CC) vs. historical-cost (HC) valuation of the net stock of fixed capital

The biggest issue concerns the denominator of the equation, that is, the calculation of the net stock of capital (private corporate fixed assets) either with current costs (also called replacement and market costs) or with historical costs. The detailed definitions that the BEA ascribes to these two methods used to measure the stock of fixed capital are available in Appendix B and can be summed up as follows.[i] The CC method expresses the value of the net stock of capital in any given year in prices of that year, i.e. the amount (of value) that would be necessary to buy that specific stock of capital in the given year (BEA, 2003, pp. M-8). The HC method reflects the value of the stock of capital at the time of its original purchase and is estimated in a manner that resembles the accounting and bookkeeping techniques that companies use to produce financial reports and statements (BEA, 2003, pp. M-10).

Kim (2012), to name one of the many, claims that HC valuation of the net stock of capital is an inconsistent, irrelevant, and unreliable variable when it comes to calculating profit rates and assessing profitability trends, and that the only representative

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[13] The application of the HP-filter on the several time series was done in Excel 2010, using the HP-filter Add-In designed by Kurt Annen, which is available on the Internet at: http://ideas.repec.org/c/dge/qmrbcd/165.html.

way of measuring the capital stock is the replacement cost method. As has been mentioned earlier, in section 2, the HC valuation of the constant capital is promoted by some proponents of the TSSI approach, and mainly by Andrew Kliman (2012), who argues that the profit rate which is based on CC valuation is not a profit rate at all. His main argument in this debate, that there is no "moral depreciation" of constant capital throughout its lifecycle, has been discussed earlier. In our understanding, Marx supported the CC valuation of fixed capital firmly. In addition, this method has been adopted by the vast majority of scholars who have examined long-term profitability trends (e.g. (Brenner, 1998; Duménil & Lévy, 2002; Economakis, Anastasiadis, & Markaki, 2010; Michl, 1988; Moseley, 1991; Roberts, 2010; Shaikh, 2010; Weisskopf, 1979).

In a new article that was published this year, Basu (2013) argues that in the postwar period of US capitalism (1946-2010), profitability trends are not affected by the choice between HC or CC valuation of the net capital stock. He claims that there is a threshold rate of inflation for capital goods for which percentage changes between the two ways of measurement remain constant. According to his calculations, the entire postwar period in the US was one where the average rate of inflation in the price of capital goods equaled the threshold value. That being the case, the percentage changes (not the levels) in profit rates with both approaches, and subsequently the profitability trends in the long run, would not alter in accord with the different capital stock valuation methods. Despite the fact that we theoretically support the CC valuation for the aforementioned reasons, we acknowledge the contribution of the TSSI proponents in the advancement of Marxian theory, and crisis theory in particular. In order to do justice to both approaches we will utilize both methods of capital stock valuation in the empirical analysis and see if Basu's conclusion can be corroborated by our calculations. The focus of the discussion however will be on CC profitability trends. When the use of the HC net stock valuation method is not explicitly stated in the text, the reader can assume that the CC valuation method is implied.

3.2.2. Profit flow measures

As far as the calculation of profit flows is concerned, the main point of question is whether to use before-tax or after-tax profit flows. This should presumably affect the levels and to some extent also the fluctuations of the profit rates, as US governments' policy concerning the taxation of corporate profits was fairly stable after World War II and until 1987, but changed to the benefit of big corporations after that.[14] The average ratio of taxes to corporate profits is 40% for the period under discussion.[ii]

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[14] Federal Corporate Income Tax Rates declined by 12% in 1987, from 46% to 34%, for enterprises with income that exceeded $335,000USD (Source: Treasury Department; Commerce Clearing House (CCH); Tax Foundation).

What is more, measuring homogenous profit flows for miscellaneous sectors (productive, commercial, financial capital) in a globalized economic environment can be a very demanding accounting task, but it is unlikely to find data that are more comprehensive on corporate income flows than those provided by the American statistical institutions, and more specifically by the BEA (Tabb, 2010). In order to avoid such implications four different variants of the profit flow will be used to calculate and compare profit rates and see if their trends display similar tendencies. These four measures, from the broadest to the narrowest are the, NVA-L, the Net Operating Surplus – NOS, the Before Tax Profits – BTP, and the After Tax Profits – ATP.[15] The four profit rates that will result from these measures will be called Total Surplus-Value Rate – TSVR, Net Operating Surplus Rate – NOSR, Before Tax Profit Rate – BTPR, and After Tax Profit Rate – ATPR. Despite the fact that all four measures will be utilized, we agree with Weisskopf (1979), in the point he makes that before-tax profit flows precede after-tax profit flows both temporally and conceptually, and are thus more relevant in the examination of business decisions driven by profitability, as taxes affect businesses' investment decisions only secondarily.

Another limitation in the analysis of profit flows is that a large part of upper managerial income, such as bonuses, that is calculated as employee compensation, is in essence profit income. This restriction in the data may have an underestimating effect on profits, especially in the recent years before the crisis, when high-profile executives ("golden boys") of large firms were receiving big payments from dividends. Apart from that, some Marxist researchers do not include the entire corporate sector in their analysis, because they make a distinction between productive and unproductive labour, i.e. labour that produces value and surplus value in production activities in contrast with labor employed in circulation and supervisory activities (see further in Moseley (1992)). This issue will not be treated here.

Finally, there is no distinction in the BEA's NIPA tables between profit flows produced within the country or abroad. This is a major setback, as this distinction would allow us to account for developments in international competition that have had a large impact on American manufacturing. Undoubtedly, the estimation of these figures, which requires the additional use of the Flow of Funds Accounts of the Federal Reserve – Fed, would add to the external validity of this project. However, a task as laborious as that is beyond the scope of this paper.

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[15] NVA-L = Net Value Added minus Employee Compensation. This profit measure is closer than any other to what could be measured as total surplus value as Marx defined it the 3rd Volume of *Capital*. If you subtract Taxes on production and imports less subsidies from this number, you get the NOS. If you further subtract Net interest & miscellaneous payments (NIP) and Business current transfer payments (BCTP) from the NOS you get the BTP. Finally, ATP is the difference between BTP and Taxes on corporate income. All the aforementioned measures include Inventory Valuation Adjustment – IVA and Capital Consumption Adjustment – CCAdj.

3.2.3. Why the US corporate business sector?

In this part, the motivation behind the choice of country, period, and sectors for analysis will be summarized. To begin with, the choice of the US economy, although not the only available option, is quite evident in the investigation of processes that relate to the innate dynamics of capitalist development. The United States remain, and will be for some years to come, the greatest capitalist economy of the world. As such, it is reasonable to assume that the endogenous forces in the process of capital accumulation and technological progress are more apparent in the core of the global free market economy. The same approach was followed by Marx in his economic works, as his main area of study was the economy of 19th century-Britain, which at that time was the most developed capitalist nation of the world. Besides that, reliable macroeconomic data for every aspect of the postwar US economy can be very easily retrieved from the internet without any restrictions, something that is essential when time restrictions on the completion of a research project exist.

Second, the period under scrutiny is selected for a variety of reasons. Limitation of data does not constitute one of them, since the data series on profit flows and fixed assets available from BEA go back to 1929. The decision to focus on the postwar period up until 2011 was made to narrow down the scope of the paper and focus more on the current crisis in reference with 1970s crisis, which is widely considered as a profitability crisis. The inclusion of the Great Depression and the war period in our analysis would have required a far greater amount of time for the consideration of a number of exogenous factors that could potentially distort our theoretical focal point. In the chosen period, it is easier to compare and contrast similarities and differences in profitability trends between the two crises, and check if the different profit measures indicate a restoration of profit levels to pro-crisis peak levels.

Finally, the choice of restricting the empirical analysis to the CB sector of the US economy is made for a variety of reasons that have also been noted by the majority of researchers who have undertaken similar research and followed this approach (Basu & Vasudevan, 2013; Duménil & Lévy, 2002, 2004; Economakis et al., 2010; Kliman, 2012). The main reason behind this decision is that throughout the period under investigation, the corporate sector covers approximately 75 percent on average, of the total domestic business income and the total business fixed assets. This means that during this period, three quarters of the total constant capital were owned by the corporate sector, from which in succession three quarters of the total business income were generated. The nonfinancial corporate sector in particular, which accounts for roughly 92 percent of the corporate sector's total activity (in terms of net fixed assets and net value added), is considered to be the most representative of the US economy's capitalist core (Bowles, Gordon, & Weissskopf, 1986).[iii]

4. Heterodox interpretations of the crisis

4.1.   A small note on the historical debate on the stagflation crisis

The structural crisis of the 1970s had also been in the center of the debate on causal mechanisms that come into play before the manifestation of a crisis. The theoretical accounts that were proposed in an attempt to explain this crisis once more differed largely. Nonetheless, there was a wide consensus on the declining trend of the profit rate that characterized the period of gradual attenuation of the postwar growth dynamics in the advanced capitalist economies (Basu & Vasudevan, 2013). A reflection upon the theoretical accounts that were promoted to explain the fall in the rate of profit in that period is necessary in order to comprehend the basis of the current debate.

A concept that remains dominant for the explanation of the crisis in the 1970s is the "profit squeeze" or "rising strength of labor" theory. According to this theory, the root of the crisis is found in eroding profitability, which is the result of an increasing wage share in total output at the detriment of the profit share during the expansionary phase of the cycle. This is in turn attributed to intense class struggle and rising labor power (Boddy & Crotty, 1975; Glyn & Sutcliffe, 1972; Weisskopf, 1979; Wolff, 1986). This process was indeed evident in the postwar "Golden Age" of capitalism, where most of the advanced economies aimed at full-employment levels, which gave the working classes increased negotiation power in the promotion of their interests through strong unionization (Maddison, 1991).
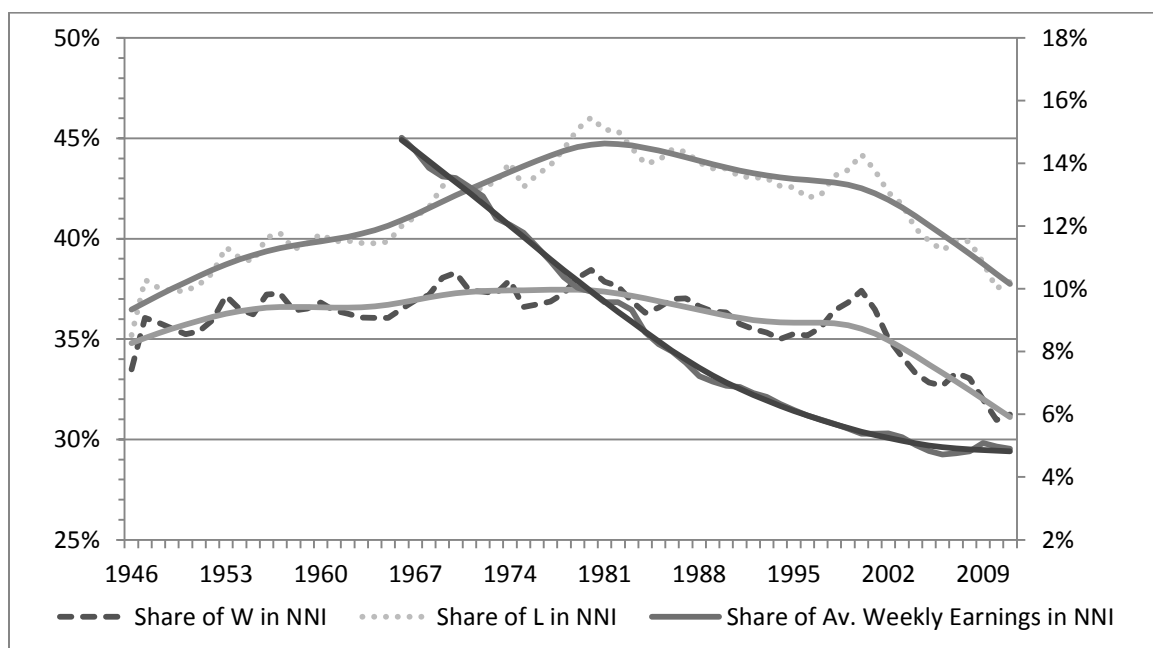
Figure 1. Share of Employee Compensation (L), Wage and salary accruals (W), and Total Average Weekly Earnings (secondary axis) in the Net National Income, 1946-2011, Annual Figures with HP-filtered trends[iv]

As we can observe in Figure 1, during this period the share of Employee Compensation (L) and in the Net National Income (NNI) rose by more than 10% (from 35.2% in 1946 to 46.04% in 1980) and the share of Wages (W) in the NNI rose by 5% during the same period (from 33.48% to 38.45%).[16] The increasing difference between L and W can be attributed to the fact that an increasingly larger portion of labor income is in the form of benefits and supplements to the salary (pension and welfare, social and health insurance funds, and so forth). However, the specific concept is not useful when examining the current crisis in the US, because real wages have generally stagnated or fallen in the period after the late 1960s-early 1970s, and so has the wage share (CEA, 2012). In 2010, the share of L in NNI had fallen to 37.53%, almost reaching its 1946 level. In the same year, the share of W in NNI had fallen well below its 1946 level to a record low of 30.98% for the postwar period. If we further examine the weakest groups of working people in the American society, the production/nonsupervisory workers in private nonagricultural industries, we will find that their real wages have remained stagnant around an average of circa 282 USD, and that the share of their income in the NNI is steadily falling after 1966 up until to this day (CEA, 2012).[17]

Other explanations focused on technological rather than distributional factors that would explain the declining trend in profitability. The rise in the organic composition of capital as a result of labor-saving technical change was one of the main (Shaikh, 1987). Fred Moseley (1992), another Marxist academic from the US, ascribed the profitability crisis to the relative increase of unproductive labor vis-à-vis productive labor. The exhaustion of the favorable technological and institutional advancements of the postwar period, which had led to the reallocation of resources and to the structural change of the economy, by the late 1960s – early 1970s, is the rationale promoted by Dumenil and Levy (1999) to explain the slowdown in productivity growth and the fall in the rate of profit.[18]

The 1970s crisis was also attributed to productive overcapacity of the monopoly-capitalist economy, which is accompanied by inadequacy of effective consumption and investment and thus has a tendency towards stagnation by the "Monthly Review School" (Baran & Sweezy, 1966; Magdoff & Sweezy, 1981). Another contributor to the Monthly Review, Robert Brenner (1998, 2006), identified the increasing intensity of international competition between the leading industrial economies (US, Germany, Japan), as the reason behind shrinking profit margins and overcapacity in the manufacturing sector, where he located the core of the crisis. In a similar fashion with the profit squeeze theory,

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[16] Wages = Wage and salary accruals = Employee compensation minus benefits and supplements to wages and salaries

[17] Employee Compensation for the entire corporate sector is probably an overestimation of working class income, because it includes upper management and executive incomes that are in essence profits (see p.16).

[18] For additional approaches on the saturation of the "Golden Age" growth dynamics (1946-1973) see more in Abramovitz (1986), Dumke (1990), Eichengreen (2007), and Temin (2002).

the supporters of the Social Structures of Accumulation theory (SSA) saw the root of the crisis in diminishing labor productivity and falling work intensity, which was the outcome of the, beneficial for labor, postwar SSA (Bowles, Gordon, & Weisskopf, 1983).

4.2. The current debate

The element that distinguishes the controversy this time is that the unprecedented collapse of the banking and wider monetary sector in many economies has highlighted the financial aspect of this crisis, which has been acknowledged by the majority of authors (Choonara, 2009). The role of the monetary sector in the unfolding of crises has also been treated by Marx, but in a more descriptive manner, when he discusses English banking crises (Tabb, 2010). The dispute arises when it comes to whether the systemic root of the crisis is founded primarily in the financial sector, which only secondarily affects the "real" economy, or vice versa, if it is based on the overall problematic performance of the nonfinancial enterprises that fostered the process of financialization and amplified its effects.[19]

  This study is mainly concerned with the group of scholars that investigate the latter question. In the following section, a very brief overview of the main arguments of the financialization explanations will be made. Afterwards, the alternative interpretations of the Great Recession that highlight the importance of the profit rate, in reference with the debate on the causes of the stagflation crisis where needed, will be made.

4.2.1. The financialization approach

Robin Blackburn (2008), was one of the first who identified the problem in the subprime mortgage market and attributed the crisis that followed the credit crunch to the weaknesses of the "Anglo-Saxon" model of capitalism which promotes privatization, deregulation of the global financial markets, and instability. For the late Peter Gowan (2009), the root of the crisis was founded within finance itself, and more specifically in the emergence of the "New Wall Street System" which produced new kinds of actors, agents, practices, and dynamics in the financial markets that were the primary forces behind the malaise of the US economy. Loosening or repeal of laws such as the Glass–Steagall Act which regulated capital markets and banking procedures have also been promoted as explanations for the augmentation of consumer finance and "casino-capitalism" (see for example Lapavitsas, 2009, 2010, 2011).

  Foster and Magdoff (2009), following the "Monthly Review" tradition and extending on the work of Veblen, Schumpeter, Keynes, Kalecki, Steindl, and Minsky,

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[19] *"As long as the social character of labour appears as the monetary existence of the commodity and hence as a thing outside actual production, monetary crises, independent of real crises or as an intensification of them, are unavoidable"* (Marx, 1991, p. 649). Defining which is the primary and which the secondary element in this causal relation is the kernel of the question on the current crisis.

claim that this is a crisis of the monopoly-finance capitalism, since financial bubbles are the means by which the economy attempts to overcome the underlying tendency towards stagnation in late capitalism. The inflated financial sector has become the "waste" area of our times, much like what military spending was for the US in the 1960s, according to Sweezy, Baran, and H. Magdoff. In fact, these bubbles, the authors maintain, only intensify, rather than reverse the long-term stagnation tendency of the economy through debt expansion. On a second level, this leads to the magnification of the "real world" repercussions of the crisis.

Lapavitsas sees the crisis as the result of "financial expropriation" of profits from wages and salaries by the banking system, as he claims that workers have to cover many of their needs (health, education, insurance and so forth) which were privatized in the neoliberal era through debt (Lapavitsas, 2009, 2011). In a like manner, Moseley (2011) asserts that profit rates have largely recovered after the previous crisis of profitability at the expense of increased exploitation and stagnant real wages of the working classes, a view also shared by McNally (2009). This, claims the former, has led to increased household indebtedness and over-indebtedness in the financial sector as a whole, which is the basis of the feebleness of the US economy. Duménil and Lévy (2011a), in their latest book and in a series of articles dedicated to the present structural crisis, associate it with neoliberal-specific attributes in the era of the US political and economic dominance in the "world stage". They maintain that the current problematic performance of the US economy is the outcome of increased contradictions in the international competition, a *"trajectory of cumulative disequilibria […] that the international hegemony of the country rendered possible"* (Duménil & Lévy, 2011b).

The importance of technology (Information and Communication Technologies – ICTs), financial innovation, and financial engineering in the diffusion of the crisis through financial instruments such as derivatives (mainly collateralized debt obligations and credit default swaps) has also been stretched in several articles (Bryan & Rafferty, 2008; Lapavitsas & Dos Santos, 2008). Steve Keen (2011) developed a novel approach, which extends upon Hyman Minsky's theory of the inherent instability in the financial sector and Irving Fisher's theory of debt deflation to give an endogenous explanation of the crisis. Another such account is presented by Reinhart and Rogoff (2008), who argue that in periods prior to systemic banking crises, bubbles in asset prices, large capital inflows and credit booms are a common characteristic and that in the aftermath of such crises central government debt increases significantly with a certain time lag.

These approaches are very significant in the course of uncovering the principal forces that defined the financial dimension of the crisis and its forms of manifestation in this historically specific socioeconomic environment. Even though they consider structural processes that arose in the neoliberal era, they focus mainly on exogenous factors and policy implications that are associated with this specific development model and are not inherent in capitalism. That is why within this group of scholars the crisis is

perceived as a result of the dominance of finance in economic activity and not as the outcome of a wider problematic performance of capitalist production.

In our view however, these approaches were more relevant in the early phase of the financial slump, when the broader economic implications of the current crisis for the nonfinancial sectors were apparent neither in the US nor in Europe. Hence, in the recent conjuncture, and without underrating the importance of the financialization process, the principal causes of the crisis have to be sought in the entire spectrum of economic activity. Finally, one needs to point to the fact that, although most of the abovementioned scholars originate from a Marxist background, those interpretations owe more theoretically to Keynes and especially Minsky, rather than Marx, for the reason that their analysis is not based on concepts such as value, capital, accumulation, productivity, profit rate and so on.[20]

4.3.   The dispute over profitability trends

What is striking in the case of the contemporary dispute among Marxist scholarship is that there is no general assent on the cardinal issue of the empirical trend in profitability, mainly in the years after 1982 and until today. Whether or not the profit rate in the US CB and NFCB sectors recovered in this period to its previous high levels or whether it displayed a long-term declining trend that keeps it stagnating below the pre-1970's high levels, remains to be seen in our empirical analysis.

From the scholars that have engaged in the empirical inquiry of profitability trends in reference with the current crisis, two distinct groups can be identified. First, those who recognize a secular declining trend in the rate of profit or at least the incapacity of the economy to revive profitability to previous high levels. Second, those who observe that the rate of profit has to a large extent recovered in the previous years and focus more on demand-side explanations of the crisis. The theoretical and methodological dissimilarities in the calculation of profit rates have been discussed before. Only the findings of the various scholars that have treated this issue will be presented here.

Amongst those who have undertaken such kind of empirical research and maintain that profit rates have more or less recovered in the years after 1982, which means that they do not classify the Great Recession as a profitability crisis, are Duménil and Lévy (2011a, 2012); Mohun (2006, 2009); Moseley (2008, 2011). These authors conclude in their works that profitability trended upward in the period after 1982 and thus seek the causes of the crisis elsewhere. These explanations have been discussed earlier. In summary, the kernel of their thesis lies broadly in the process of structural restructuring

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[20] *"The main problem in the current crisis is the financial sector [...] [t]he best theorist of the capitalist financial system is Hyman Minsky, not Karl Marx. The current crisis is more of a Minsky crisis than a Marx crisis"* (Moseley, 2008).

of the US economy in the neoliberal era through financialization and deregulation of capital markets, whose main attributes are increased dominance of capital over labor, rising income inequality (especially between upper management and production or nonsupervisory workers), lack of effective demand, massive expansion of household debt, macroeconomic disequilibria (twin deficits) and global imbalances (rising external government debt).

The scholars that have associated the present structural crisis in some way with eroding profitability are Brenner (2006, 2008); Carchedi (2009, 2011); Economakis et al. (2010); A. Freeman (2009); Kliman (2012); Kotz (2009); Roberts (2010); and Shaikh (1999).

Brenner's account has been discussed in relation to the 1970s crisis. In assessing the Great Recession, he follows the same conceptual framework and argues that this is a postponed crisis that displays the chronic problems of the accumulation process in the manufacturing sector caused by the intensification of international competition (Brenner, 2006, 2008). The firm entrance of the Newly Industrialized Countries – NICs (East Asian Tigers, China, and India) in the global manufacturing map, amplified in his view, the overcapacity problem in the advanced capitalist countries and did not allow for the restoration of profit rates. Wage repression and cuts in government spending were promoted to reverse the fall in the profit rate with devastating results for aggregate demand and the stability of the economy. The policies that were followed to keep the economy running smoothly, he claims, are the reason behind the debt explosion in the US. In a comparable approach, Kotz (2009) ascribes the crisis to overcapacity caused by overinvestment in asset bubbles. Once the bubble bursts, falling capacity utilization drives down profit rates and consequently investment and demand.

Alan Freeman (2009) associates the profitability crisis with the long-term increase in the organic composition of capital caused by the introduction of labor-substituting technology. He supports that this is historically depicted in the development of the output-capital ratio and not in that of the profit share, which would mean that distribution outweighs technological changes in the movement of the profit rate. Carchedi (2011), Kliman (2012), Roberts (2010), and Shaikh (1999) also share this opinion, although Carchedi argues that the tendency of the rate of profit to fall has been to some degree counterbalanced by the rising rate of exploitation after 1987. Economakis et al. (2010), using the most advanced econometric model for the decomposition of the profit rate in related literature that we are aware of, find that during different upward or downward periods from 1929 to 2008, some factors are statistically more significant and strong in explaining the variance of the profit rate than others. Nevertheless, the authors argue that in the long run, both the evolution of real wages (distribution) and the composition of capital (technology) in relation to labor productivity, which is the most significant determinant, have a combined effect on the fluctuations of the profit rate.

According to Economakis et al. (2010) and Kliman (2009), the restoration of the profit rate to healthy levels after the stagflation crisis has not occurred, because the massive destruction of capital that took place during the Great Depression and the Second World War, has been avoided this time through government aid to corporations in the fear of unprecedented events that could have a severe effect on the already fragile accumulation process in the US.[21] In the following section the empirical results will be analyzed in reference with the abovementioned accounts to see which approach best captures the reality of the profit rate movements.

5. Results

The mechanisms through which profit rates affect the macroeconomic performance of an economy have already been underlined. The theoretical framework under which profitability trends are associated with the emergence of structural crises, as well as previous research on the subject, has also been presented. What remains, is the analysis of our empirical findings, which will follow in this section.

5.1. Profit Rates

I will broadly distinguish the period between 1946 and 2011 in two major phases, using the entire range of socioeconomic, political, and institutional characteristics that defined them.

The first period from 1946 to 1980 is the era of what has been called the postwar "social compromise", which had started to fade already from the early 1970s and was mainly characterized by: government policies towards full employment; the dominance of Keynesian economics; a stable international monetary system with rather fixed exchange rates; big credit institutions that facilitated long-term productive investments in new capital goods and technologies; corporate governance focusing on constructive reinvestment of profits in return for wage moderation; strong unionization; and finally steady actions against protectionism in trade, labor, and capital movements (Maddison, 1991).[22]

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[21] Destruction of capital, does not only mean the physical destruction of tangible assets (use values in Marxian terms) that happened for example during WWII (buildings, plants, infrastructure and so on), but also the monetary devaluation of capital (exchange value in Marxian terms) as the term is used nowadays.

[22] Under the Bretton Woods System, which was a system that regulated international monetary policy, restrictions on capital mobility were imposed and exchange rates could only marginally fluctuate (+/- 1%) because currencies of the member countries were pegged to the US dollar which in turn was pegged to gold (Eichengreen, 2008, pp. 91-92). Multilateral trade was on the rise and was institutionally supported by the GATT (General Agreement on Tariffs and Trade), which oversaw tariff reductions. In this environment of limited capital mobility, rather fixed exchange rates, and open trade promotion developed countries were capable to exercise independent/expansionary monetary and fiscal policies that aimed at full employment (fundamental policy trilemma) (Findlay & O'Rourke, 2007, pp. 485-486).

The second period, from 1980 to 2011 is the era of globalization, with the US in the forefront, which saw the gradual prevalence of the wider service and financial sectors over the traditional goods-producing sectors in the West. The definitive attributes of this period that could be labeled as the era of neoliberal hegemony are: fiscal austerity aiming at price stability; lesser role of the state in the economy, mainly through privatization; free floating exchange rates, free trade, and further deregulation of capital markets; very weak unionization and declining labor strength; increased economic and political power concentration to elites; and predominance of neoclassical economics in academia and politics (Harvey, 2005). Within this broad historical perspective, we will attempt to assess the evolution of the profit rate for the CB and NFCB sectors in the US.

5.1.1. Current-Cost (CC) Profitability Trends

Figure 2 and Figure 3 plot the four different profit rates of the CB and NFCB sectors, along with their HP-filtered trends, for the entire postwar period up to this day. A first impression from the visual observation of the graphs is that although the levels of the various profit rates are different, their fluctuations through time display a similar pattern. This is in fact verified by the closer inspection of the variances between the four profit measures, which more or less remain stable throughout this period. Nevertheless, the extent of the fluctuations in the different profit rates varies significantly, which affects the outcome of their evolution in time.
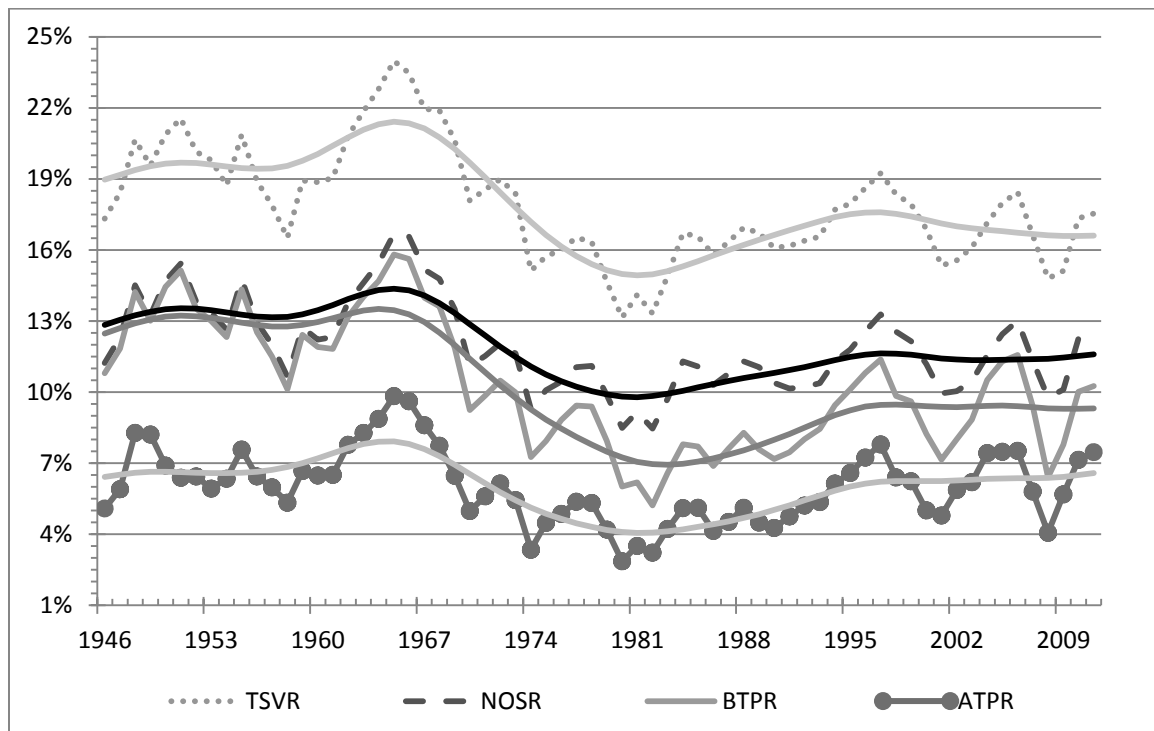
Figure 2. Profit rates, US Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[v]
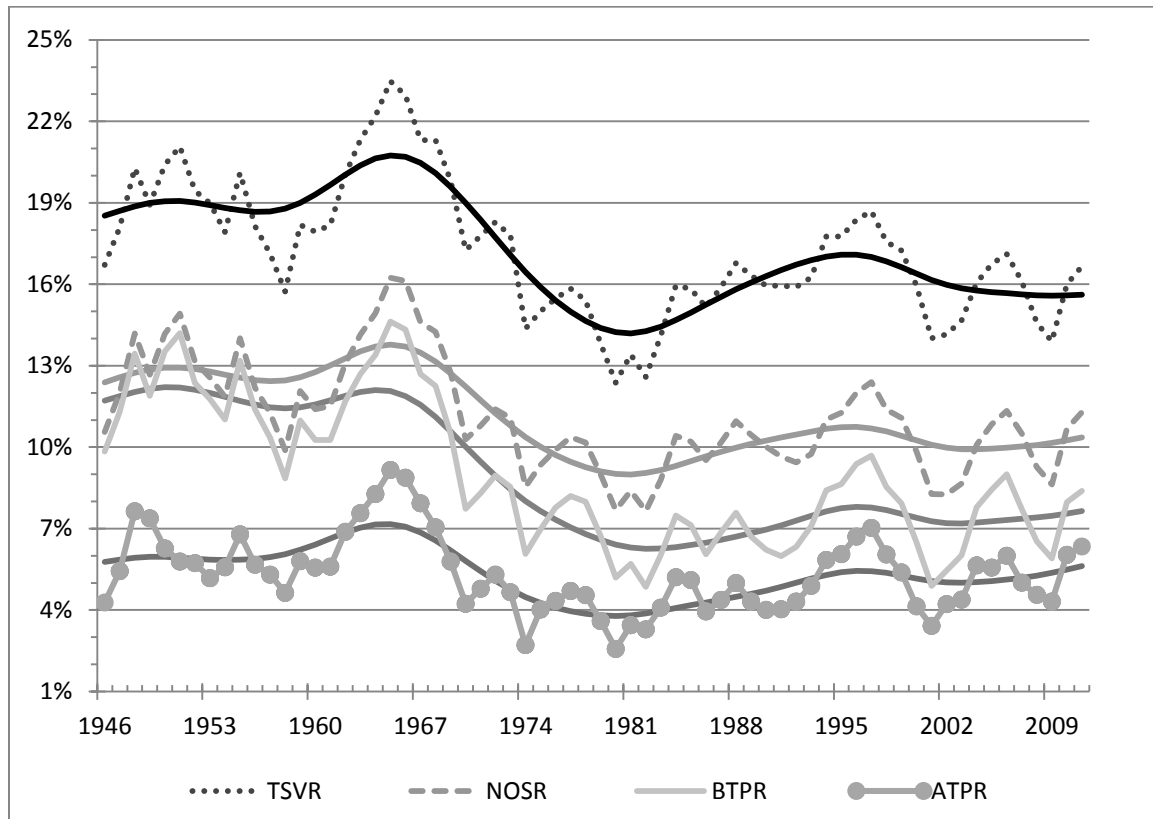
Figure 3. Profit rates, US Nonfinancial Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[vi]

The two extended periods described before, can be further separated into four minor phases that are common in the movement of the profit rates. The first period from 1946 until 1965 is a period of uniform profit rates with a slight upward trend towards the end of the 1950s. This small but rather sharp upward movement starts in the trough of 1958 and reaches its peak in 1965, when the postwar growth dynamic is exhausted and the decay of the advanced capitalist economies that would lead to the prolonged crisis of the 1970s begins. Nevertheless, this marginal trend is probably a result of business cycle fluctuations, although a safe inquiry into its causes would require going back in time, which is not in our intentions here. This era has not been termed as the "Golden Age" of capitalism without reason. The profit rates that corporations were able to achieve during these years are on average the highest of the entire period under examination. It is obvious from Table 1 that these rates of profit remain unmatched until today, despite the fact that the wage share was on the rise during this period (see Figure 1). What is more, the average annual growth during these years, which is calculated as a Compound Annual Growth Rate (CAGR) and presented in Table 2, is very high for both sectors, although

lower than the ones witnessed during the neoliberal rebound of 1980-1997.[23] That is reasonable, because profit rates in 1946 were already high, so their rate of growth could not exhibit large values, as their margin of increase was low or fully exhausted. On the other hand, the profit rates in 1980 were at an all-time low, which explains their potential for high growth rates.

Table 1. Average Profit Rates for selected periods, US Corporate Business and Nonfinancial Corporate Business Sectors, 1946-2011 (Current-Cost Net Stock Valuation)

Break-Point Periods	TSVR		NOSR		BTPR		ATPR	
	CB	NFCB	CB	NFCB	CB	NFCB	CB	NFCB
1946-1965	19.87%	19.21%	13.47%	12.84%	13.03%	11.85%	6.95%	6.22%
1965-1980	18.34%	17.64%	12.08%	11.41%	10.45%	9.18%	5.92%	5.27%
1980-1997	16.29%	15.84%	10.65%	9.99%	7.93%	6.96%	4.97%	4.68%
1997-2011	16.96%	15.96%	11.50%	10.17%	9.36%	7.38%	6.32%	5.20%
1946-2011	17.91%	17.22%	11.95%	11.14%	10.27%	8.95%	6.03%	5.34%

In the second part of the first period, there is a huge decline in the profit rates of both sectors, which clearly signifies the undisputable role of eroding profitability in the stagflation crisis of the 1970s, as most scholars have indicated. Already from 1965, all profit rate measures had started falling and by 1980, their values had diminished by half or more. Moreover, the annual growth rates for this period display high negative values, which are not entirely counterbalanced by similar positive values in the following periods.

Table 2. Compound Annual Growth in Profit Rates for selected periods, US Corporate Business and Nonfinancial Corporate Business Sectors, 1946-2011 (Current-Cost Net Stock Valuation)[vii]

Break-Point Periods	TSVR		NOSR		BTPR		ATPR	
	CB	NFCB	CB	NFCB	CB	NFCB	CB	NFCB
1946-1965	1.64%	1.71%	2.00%	2.17%	1.93%	2.00%	3.35%	3.88%
1965-1980	-3.69%	-3.92%	-4.13%	-4.57%	-5.86%	-6.26%	-7.43%	-7.64%
1980-1997	2.14%	2.32%	2.52%	2.69%	3.61%	3.52%	5.74%	5.75%
1997-2011	-0.61%	-0.76%	-0.45%	-0.62%	-0.69%	-0.96%	-0.29%	-0.68%
Trough-to-trough								
1958-2001	-0.17%	-0.26%	-0.15%	-0.40%	-0.79%	-1.34%	-0.24%	-0.69%
1958-2009	-0.17%	-0.24%	-0.10%	-0.26%	-0.50%	-0.78%	0.12%	-0.14%
Peak-to-peak								
1965-1997	-0.67%	-0.69%	-0.69%	-0.81%	-0.99%	-1.24%	-0.70%	-0.80%
1965-2006	-0.62%	-0.75%	-0.59%	-0.85%	-0.74%	-1.15%	-0.63%	-1.00%

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[23] The CAGR is commonly used by companies to calculate the average annual growth in rates of return or rates of investment, thus making it a suitable measure to assess the progress of profit rates. In essence, the CAGR is the slope of the linear trend between two data points.

The third period signifies the resurgence of capital profitability, as the growth rates of the profit measures are again positive and the trends for the CB and NFCB sectors are ascending. Nevertheless, the average profit rates are the lowest among all other phases and these 17 years of significant increase were not enough to fully reverse the previous decline, excluding the ATPB in the CB sector, which recovered to a much bigger degree that the other rates. This obvious dissimilarity between the three broadest profit measures and the ATPR, which depends very much on taxation of corporate income, is substantial; it clearly displays the shift in government policy during the neoliberal era to the benefit of capital. The ATPR in the CB sector is the only measure that has reached an average close to that of the initial period and above the average for the entire period (see Table 1). Despite these favorable distribution policies for capital, all the profit rates in the NFCB sector, including the ATPR, remain lower than their CB equivalents. Besides that, the trough-to-trough and peak-to-peak average growth rates, which are better indicators of the performance of the sector within this long wave, are all negative and higher in absolute terms than the ones for the CB sector.

Finally, in the last period, that includes the Great Recession and the years leading up to it, the CAGRs of all profit measures are negative in both sectors. The average profit rates are slightly higher than in the preceding period, but still lower than in any other phase of the long wave and lower than the average rates for the whole period under scrutiny (except for the ATPR CB). In addition to that, the trend of the TSVR in both sectors is slightly descending and that of the other measures is leveling off. What is more, it is obvious from the peak-to peak and trough-to-trough CAGRs, that the long-term profitability in the CB and NFCB sectors, aside from the partial revival of profit rates during the 1980-1997 period, is one of declining or at best stagnating nature. This denotes that prior to the crisis, the accumulation process in the US economy was certainly problematic, and profit rates in the "real" economy may have led to the boom of the financial sector.

In Figure 4, we can see that there was an enormous increase in the Financial Corporate Business (FCB) sector's share in BTP in 1998, after the exhaustion of the profit rate growth dynamic. While the sharp ascending trend and the boom in the share of financial profits in BTP, had started back in 1984, when the process of financialization was put forward as part of the wider neoliberal policy agenda to counteract the declining trend in profitability of the previous years, it was in the five years from 1998 to 2003 that this share skyrocketed from 23.3% to 40.2%, despite the burst of the dot-com bubble in 2001.
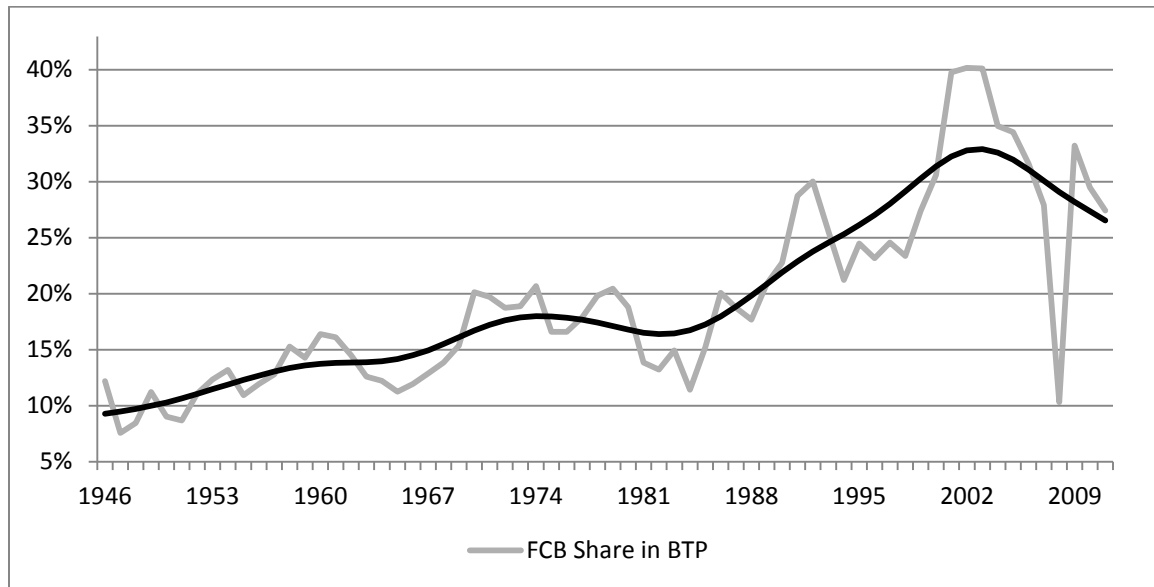
Figure 4. Share of Corporate Financial Profits (Before-Tax) in Total Corporate Before-Tax Profits, 1946-2011, Annual Figures with HP-filtered trends[viii]

5.1.2. Historical-Cost (HC) Profitability Trends

Figure 5 and Figure 6 are analogous to Figures 2 and 3, with the only difference being that HC net stock valuation of private fixed assets replaced CC valuation in the denominator. The same goes for Table 3 and Table 4, which are equivalent to Table 1 and Table 2. However, as we will now see, this has a significant influence on the levels and trends of the profit rate time series.

The periodization that was followed before can be identified in these time series, only in the extreme values, in peak and trough years. Apart from that, these figures display a completely different evolution through time, specifically one of a secular declining trend, with no cyclical variations for the entire period under investigation. Only the BTPR and the ATPR in the CB sector display a very slightly ascending trend after 1986 and all other measures in both sectors have a flat trend after 2001.

The differences between HC and CC valuation of the net stock of private fixed assets have been discussed before. HC values are consistently lower than CC values because the price index of capital assets was increasing throughout the whole period under research (Basu, 2013). Thus, as long as inflation in capital goods is positive, HC valuation will have an inflating effect on the rate of profit, which is why it significantly higher than the CC measure.
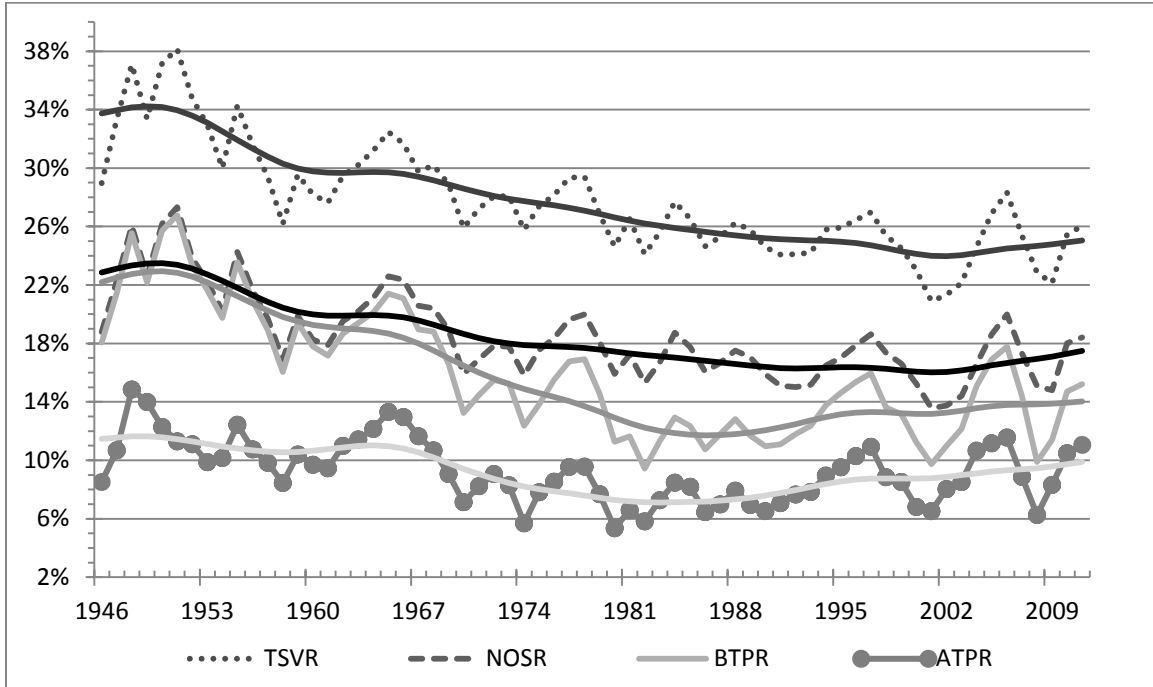
Figure 5. Profit rates, US Corporate Business Sector, 1946-2011 (Historical-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[ix]
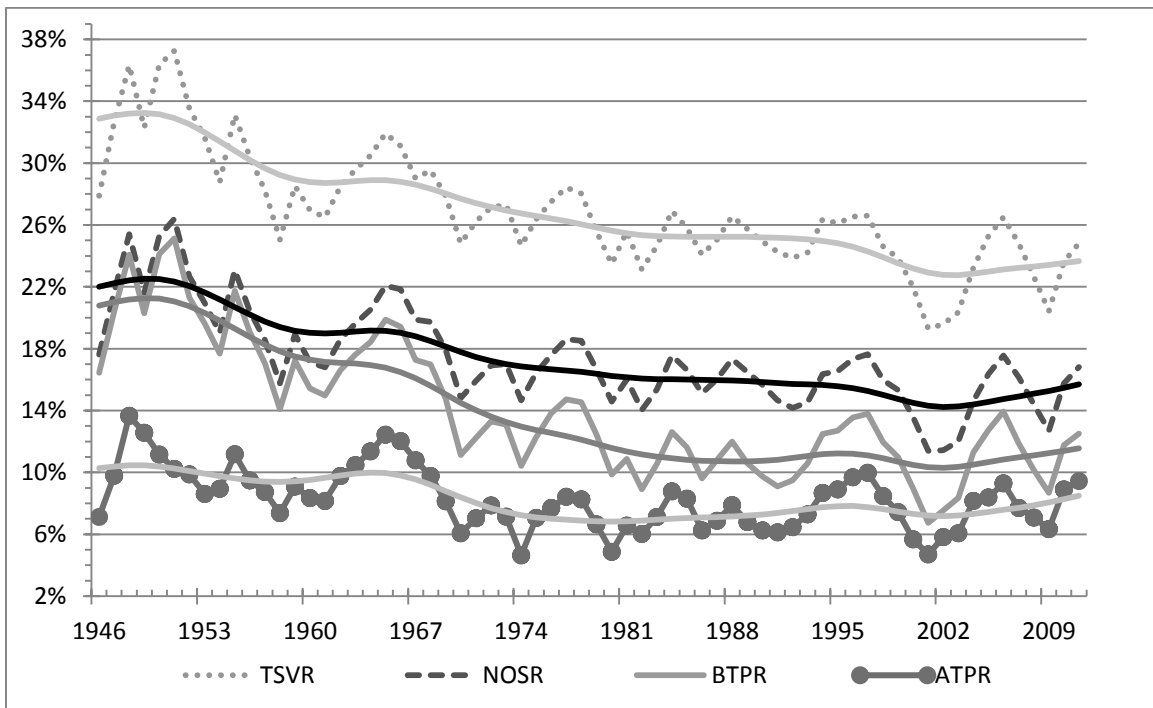
Figure 6. Profit rates, US Nonfinancial Corporate Business Sector, 1946-2011 (Historical-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[x]

If we assess the HC profitability trends with the use of the HP-Filter, we can definitely conclude that there is a secular declining trend in the rate of profit, which is not reversed throughout this period, despite some short intervals of upward movement in the time series. If we further examine the average profit rates in Table 3, we will see that all of them are declining from preceding to succeeding period. Moreover, the averages for the last period of 1997-2011, which includes the years prior to the Great Recession, are significantly lower than the average for 1946 to 2011.

Table 3. Average Profit Rates for selected periods, US Corporate Business and Nonfinancial Corporate Business Sectors, 1946-2011 (Historical-Cost Net Stock Valuation)

Period	TSVR		NOSR		BTPR		ATPR	
	CB	NFCB	CB	NFCB	CB	NFCB	CB	NFCB
1946-1965	31.80%	30.80%	21.57%	20.61%	20.89%	19.06%	11.07%	9.93%
1965-1980	28.36%	27.44%	18.66%	17.70%	16.03%	14.14%	9.03%	8.06%
1980-1997	25.51%	25.21%	16.67%	15.89%	12.33%	11.05%	7.70%	7.39%
1997-2011	24.39%	23.17%	16.56%	14.78%	13.48%	10.75%	9.10%	7.57%
1946-2011	27.74%	26.89%	18.51%	17.41%	15.91%	14.00%	9.26%	8.29%

The CAGRs for the different profit measures depict a similar image to that shown in Table 2. The sign (positive or negative) of the average annual growth rates is the same in every period, although we cannot really distinguish clear upward trending periods in the HC time series as before. Still, the difference in the absolute values of the CAGRs is noteworthy. Fluctuations in the CC profit rates are considerably larger than in the HC ones, at least when we examine the four distinct periods. Nonetheless, when it comes to the trough-to-trough and peak-to-peak analysis, the average annual growth rates are very close if we compare the figures from Table 2 and Table 4. The negative average decline is always larger (in absolute terms) in the HC profit rates for the trough-to-trough periods and smaller for the peak-to-peak periods, where CC profit rates display a larger average decline.

Table 4. Compound Annual Growth in Profit Rates for selected periods, US Corporate Business and Nonfinancial Corporate Business Sectors, 1946-2011 (Historical-Cost Net Stock Valuation)[xi]

Break-Point Periods	TSVR		NOSR		BTPR		ATPR	
	CB	NFCB	CB	NFCB	CB	NFCB	CB	NFCB
1946-1965	0.57%	0.68%	0.93%	1.13%	0.86%	0.96%	2.26%	2.82%
1965-1980	-1.71%	-1.90%	-2.17%	-2.56%	-3.94%	-4.28%	-5.54%	-5.69%
1980-1997	0.51%	0.70%	0.88%	1.06%	1.96%	1.88%	4.05%	4.07%
1997-2011	-0.24%	-0.46%	-0.08%	-0.32%	-0.32%	-0.65%	0.09%	-0.38%
Trough-to-trough								
1958-2001	-0.51%	-0.59%	-0.50%	-0.73%	-1.13%	-1.67%	-0.59%	-1.02%
1958-2009	-0.32%	-0.39%	-0.25%	-0.42%	-0.65%	-0.93%	-0.03%	-0.29%
Peak-to-peak								
1965-1997	-0.56%	-0.55%	-0.58%	-0.68%	-0.89%	-1.10%	-0.59%	-0.66%
1965-2006	-0.33%	-0.44%	-0.29%	-0.54%	-0.44%	-0.84%	-0.34%	-0.69%

The assessment of the HC profitability trends certainly leads to the conclusion that the secular trend in the profit rate is one of declining nature. This result however is "biased" because of the HC valuation method of the net stock of fixed capital, which does not account for the relative devaluation of constant capital, and is considered to be of lower theoretical relevance to the research subject than the CC valuation method. In spite of this, there are some interesting conclusions that can be drawn from the comparison of the results from the two distinct methods. First, both time series display that the long-term performance of the CB and NFCB sectors has been problematic, even after the partial revival of CC profit rates. Second, although the secular trend is not identical and the HC time series do not display evidence of long wave cyclical movements as the CC time series, Basu's (2013) conclusion, that the average percentage changes in the profit rates between two end points (trough-to-trough and peak-to-peak) are similar for the entire postwar period, is validated by our results. Third, the CC series display significantly larger fluctuations in the period of drastic decline (1966-1980) and in the period of frail recovery (1980-1997) than the HC series. Finally, the only profit rate measure that has considerably recovered is the ATPR, which signifies a distribution of the total income produced that is more favorable to capital in the neoliberal era.

5.1.3. Concluding remarks with regard to profitability trends

The fact that the leading capitalist economy of the world has not been able to reach the profit rate levels of the first two postwar decades in the 50 years that have succeeded that period denotes the long-term problematic performance of the CB sector in the US economy. If one takes into consideration that the NFCB sector, that comprises more than 90% of the CB sector and is the most significant and representative of US capitalism sector among all others, has functioned in a decreasingly effective way, then it is safe to assume that the structural aspect of the Great Recession lies within the accumulation process of the "real" economy.[24]

Wage repression, government cuts, and financial (debt) expansion were the policies used to confront the profitability crisis of the 1970s. This process created the conditions for further accumulation, concentration, and centralization of capital in a few multinational corporations that supported the new development model. Private initiative became the central force of economic activity and these companies grew too big to fail, as their network of activities extends to every corner of the world and affects the healthy operation of many other businesses and organizations (suppliers, pension funds, banks etc.). The breakdown of corporations of that size, which have an almost institutional

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[24] As these lines are written, the Detroit municipality, once the prosperous automotive and manufacturing capital of the US, has filed for bankruptcy after more than a decade of economic decay.

character in the age of neoliberalism, would potentially pull other productive sectors or profitable sections of the economy into a downward spiral. In spite of the dot-com bubble in 2001, investors and policy makers were not alarmed by the signs of structural weakness of the US economy and continued to seek outlets for profits in the financial markets (see Figure 4 and the consequent analysis). Growth once again relied on the build-up of an unsustainable bubble based on the vast expansion of household debt to fuel the subprime mortgage market. This development had no substantial benefits for the international competitiveness of the US economy, but rather amplified global imbalances (twin deficits and expansion of international public debt). When this bubble burst in 2007, affecting the entire financial sector, which had built a huge amount of derivative products on top of mortgage loans, the structural instability of the US economy became more than apparent to all economic agents and led to the Great Recession.

It has been argued by Dumenil and Levy (1999), that the 1970s crisis was caused by the saturation of the favorable postwar developments, in technology and institutions (diffusion of electrical mechanization, work standardization and managerial organization – Fordism), which had functioned effectively for about two decades under the specific historical socioeconomic environment that has been described before. In a similar manner, stemming from a technological long wave perspective, we could assess that the Great Recession may designate a crisis of the Third Industrial Revolution, namely that of the ICTs (microprocessor, computerization, Internet), that generated in the early 1970s and was widely diffused in production, with beneficial productivity effects, during the 1990s (Lennart Schön, 2010).

As in the case of the 1970s crisis, which represented the end of the postwar "social compromise" and the dominance of a new socioeconomic and institutional model of development that is widely referred to as neoliberalism, this crisis could potentially mean the end of this era, and the embarkation upon a new growth path for the global economy. However, for this to happen, there has to be a widespread destruction of capital, meaning that the "creative-destructive" tendencies and forces that are inherent in capitalism, have to be left free to act.[25] The productive implementation of groundbreaking technologies requires the violent restructuring of the economy in order to yield a sustainable developmental trajectory. This development would probably create disruptive social tendencies (massive unemployment, devaluation of capital, destruction of entire sectors, radicalization of the masses and so on) that could potentially reach in extent and severity the Great Depression, and put the current socioeconomic and political status-quo at risk (Mackey, 2010). Policy makers, who are a fundamental agent of the existing

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[25] The concept of capital destruction first appeared in Marx's work and was later adopted by German sociologist-economist Werner Sombart, who developed the notion of "creative destruction". This term later appeared in Joseph Schumpeter's work *Capitalism, Socialism, and Democracy* (1942), who put it in a long wave framework and emphasized the importance of technological innovations (Reinert & Reinert, 2006).

system of public relations, do not seem keen on assuming such a risk, as their actions to hinder these procedures have clearly shown.[26]

5.2. Organic composition of capital (OCC)

The relation of the OCC with the evolution of the profit rate has been discussed in section 2.1 in reference with the LTRPF. When comparing the profit rate measure closest to the analysis of Marx, the TSVR, with the OCC in the NFCB sector we would expect that the latter would rise in the periods of declining profitability, because the countertendencies that would mitigate the fall in the profit rate would have saturated. This is indeed evident from the visual inspection of the two time series and their HP-filtered trends. The two time series display completely reverse movements and trends, which is a very interesting finding that calls for further research since it does not constitute in any definitive way a confirmation of the LTRPF but simply a suggestion towards that direction.
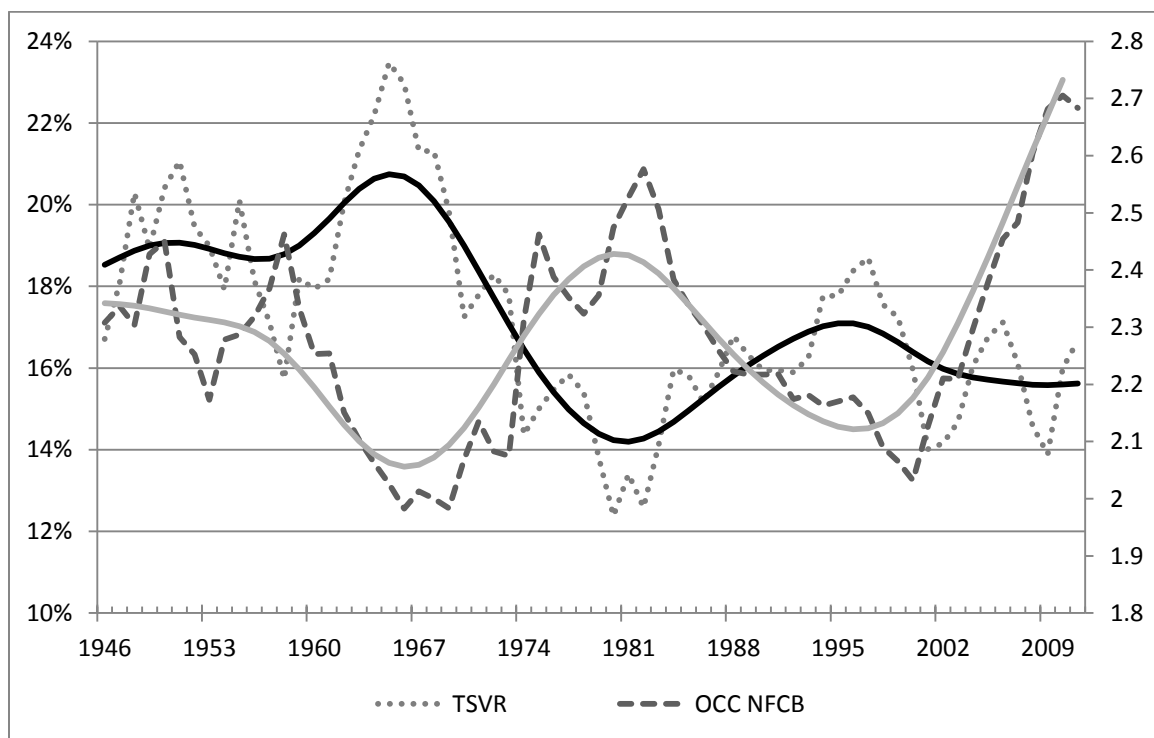
Figure 7. TSVR and Organic composition of capital (secondary axis), US Nonfinancial Corporate Business Sector, 1946-2011, (Current-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[xii]

To establish a sound causal relationship between the fluctuations of the two variables one would need to apply sophisticated econometric methods that lie out of our capabilities for

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[26] The US bailout and stimulus programs that have been implemented so far to save the banking, financial, insurance, and automotive sectors have by far exceeded $1 trillion USD (Mackey, 2010).

the present paper. Nevertheless, we will examine if there is a negative linear association between the OCC, which is variable *X* and the TSVR, which is variable *Y* (lagged by one year). We will calculate the *Pearson coefficient of correlation (r), the coefficient of determination (R^2),* and the *t* values of the correlation coefficient to determine its significance level.[27] The null hypothesis H_0, is that there is zero correlation between the two variables. The correlation of the two continuous variables is charted in the following scatter diagram. There is a moderate negative association between the two variables, as we can see from the correlation coefficient *r ≈ -0.66*, which in this case can be considered satisfactory if we bear in mind the multitude of other economic factors that can influence these variables. The coefficient of determination is equal to *R^2 ≈ 0.4*, which means that approximately 40% of the variation in the TSVR is explained by the OCC. For a two-tailed test, the correlation coefficient is significant on a 0.05% level, which is very high (*t = 7.02*). This result is promising in the direction of the validity of the LTRPF and invites for additional research in the field that would be able to offer a more comprehensive causal link between these variables.

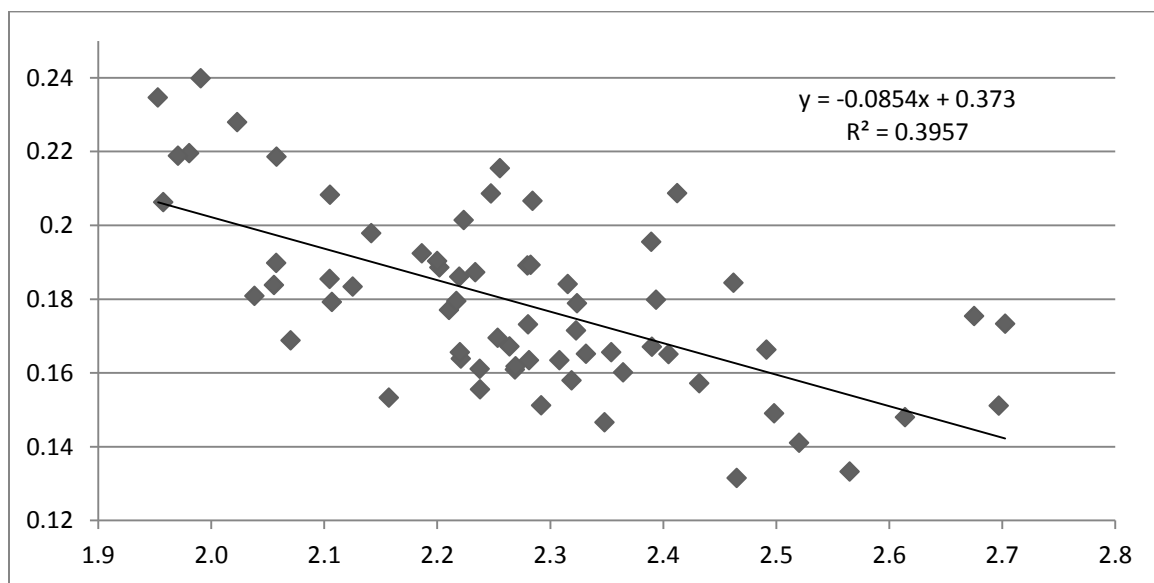**Figure 8. Scatter Diagram, TSVR and Organic Composition of Capital, US Nonfinancial Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with Linear Trend[xiii]**

This result could be interpreted in reference with Mandel's theory (1995) of technological long wave fluctuations in the profit rate owing to fluctuations in the OCC. It is safe to assume that the wider implementation of ICTs led to the replacement of living labour

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[27] Under no circumstance does this test establish a causal relationship between the two variables, however strong the correlation, or the significance level of the coefficient. It constitutes nevertheless an indication for further inquiry.

with machines in the NFCB sector, which according to the LTRPF has a negative effect on the profit rate, when the initial gain in productivity is diffused throughout the economy. The universal application of ICTs and their side-products on the production level together with the entrance of new powers in the international competition of capital-intensive goods (NICs) probably caused an exhaustion of the beneficial productivity effects that generated from the innovation capacity of the US economy. Furthermore, innovations that emanate conceptually in the US are nowadays usually developed and produced in countries with a scientifically competent workforce of lower cost through Foreign Direct Investments (FDIs), where companies face a more favorable investment environment. That does not allow the NFCB sector of the US to successfully compete on an international level with these countries since long-term productive investments are channeled towards East Asia, leaving the US as the leader only on a research level. Another explanation will be presented in the following section.
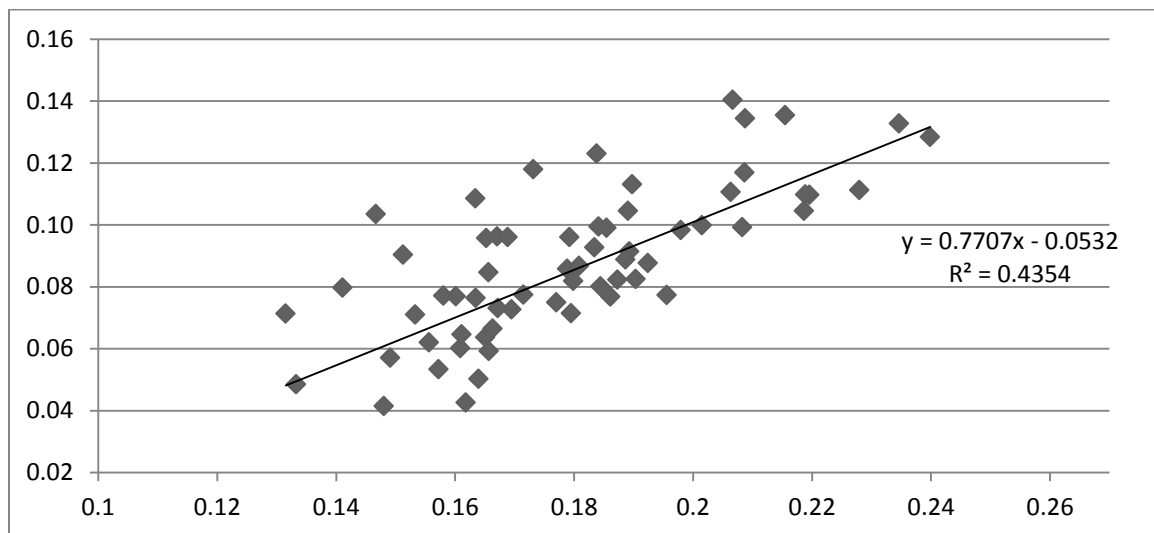
5.3. Rate of accumulation

The rate of capital accumulation is a very important factor, especially in the nonfinancial corporate enterprises where the formation of new fixed capital largely determines the productive capacity of the sector and in turn the output growth. This rate displays the percent change in the growth of the net stock of private fixed assets. Another definition could be how much new constant capital is accumulated every year as a ratio of the existing stock of fixed capital. The profit rate is closely related to the rate of accumulation, as is obvious from the following equation:

$$Rate\ of\ accumulation = \frac{NDI}{K} = \frac{NDI}{TSV} * \frac{TSV}{K} = \frac{NDI}{TSV} * TSVR \qquad (3)$$

Large profit rates are the main motivation for further investments as well as the reassurance for the healthy progression of the overall economic activity of a business through the financing of lucrative new projects and for a stable macroeconomic environment (Duménil & Lévy, 1993).

To see if there is a positive linear association between the TSVR, which is variable *X* and the accumulation rate, which is variable *Y* (lagged by one year), we will follow the same procedure as before and check the *Pearson coefficient of correlation (r)*, *the coefficient of determination (R^2)*, and the *t* values of the correlation coefficient. The null hypothesis H_0, is again that there is zero correlation between the two variables. The correlation of the two continuous variables is plotted in the following scatter diagram. The Pearson coefficient illustrates a modest positive relationship between the two variables of *r ≈ 0.66*, which is not low if we take into consideration the number and complexity of other economic factors that potentially affect these variables, as well as the cyclicality factor. The coefficient of determination is equal to $R^2 ≈ 0.44$, which means that approximately 44% of the variation in the rate of accumulation is explained by the

TSVR. For a two-tailed test, the correlation coefficient is significant on a 0.05% level, which is very high ($t = 6.97$). Despite the moderate positive correlation, there is indication that the rate of profit could affect the accumulation rate positively, but in order to establish a more sound causal relationship between the two variables, further investigation with the use of advanced econometric techniques under a strictly specified model is needed. Using historical costs for the fixed assets, Kliman (2009) found similar empirical findings, which led him to conclude that the rate of accumulation has closely followed the rate of profit in its decline, according to his calculations.
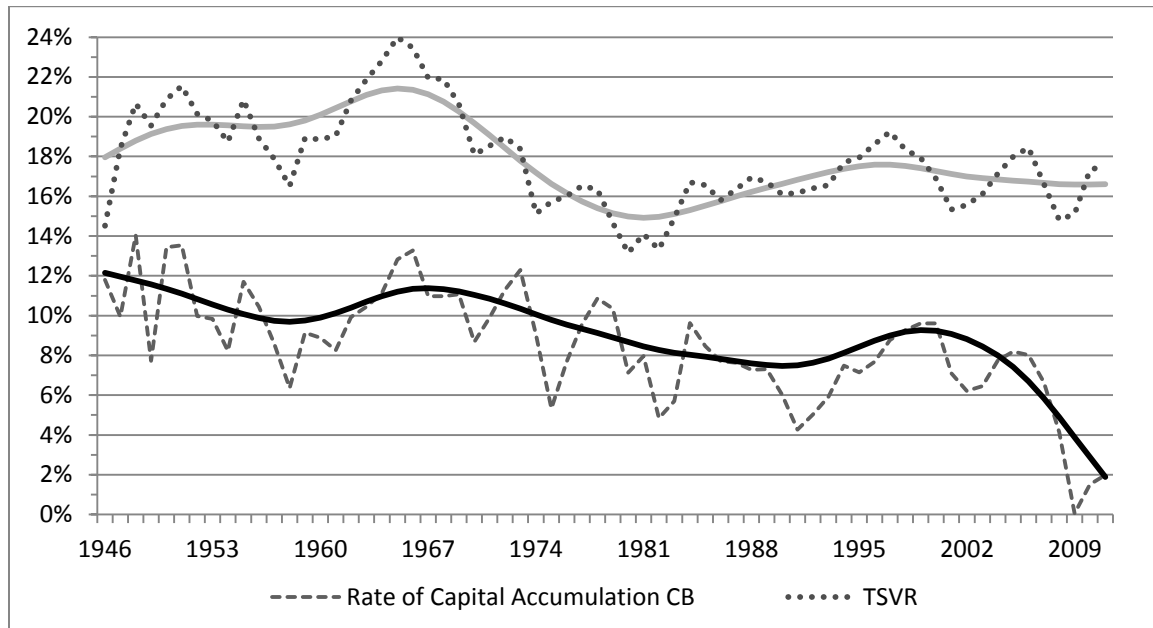

$$y = 0.7707x - 0.0532$$
$$R^2 = 0.4354$$

Figure 9. Scatter Diagram, TSVR and Rate of Accumulation, US Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with Linear Trend[xiv]

In Figure 10 below, which displays the accumulation rate for the US CB sector in contrast with the TSVR, we can distinguish both a cyclical component and a secular trend in the time series with the help of the HP-filter (the results for NFCB sector time series are almost identical). The duration of the cycle that is apparent is 33 years from trough to trough and from peak to peak (1958-1991 and 1966-1999 respectively). This periodization is in line with the one proposed by Kondratieff and Stolper (1935) and Mandel (1995), where long cycles have a duration ranging from 50 to 60 years approximately. Aside from the fact that the capital accumulation rate collapses after 2005 to reach a near-zero low in 2009, we can clearly see that the pace of capital accumulation is slowing down in the long-run and that the contracting periods are longer in duration than the expansionary ones. From 6.36% in the 1958 trough, the rate of accumulation fell to 4.26% in 1991 and to 0.05% in 2009. If we examine the peak points, we will also see that the accumulation rate fell rapidly from 13.28% in 1966 to 9.6% in 1999.

        This means that the long-term development of the accumulation rate cannot be solely explained by the movement of the profit rate, which has recovered partially or fully, depending on the profit flow measure, after 1982. The evolution of the

accumulation rate in the CB and NFCB sectors must be viewed in a long-term perspective with regard to socioeconomic and institutional changes that took place during this specific historical period and greatly affected the decision-making policies of upper management. This line of argumentation is not in conflict with the concept that the profit rate is the determinative force of the accumulation process, but rather adds to the point that the institutional changes that were made in order to tackle the profitability crisis of the 1970s, set the ground for the creation of financial bubbles that would amplify the effects of the Great Recession.


Figure 10. TSVR and Rate of Capital Accumulation, US Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[xv]

According to Duménil and Lévy (2012), in the first two decades after the war it was common practice for business managers to dedicate a large portion of the generated profit to productive investment instead of distributing it through dividends to the shareholders. Aside from that, the authors claim that in the period of the "social contract" the financial system was devoted to provide constructive loans to the producing sectors in order to facilitate the accumulation process and the stability of economic growth. In the neoliberal era on the other hand, executive managers focus on achieving stock-market targets that will raise their personal incomes in the short-run (bonuses etc.) and are highly inclined to distribute a larger part of profits in the form of dividends in order to pursue that goal. Increasing shareholder value has become the principal aim.

These developments are well documented in Figure 11. The share of net dividends in after tax profits was averaging at approximately 41% for the entire CB sector and at 45% for the NFCB sector from 1948 to 1981. From 1982 to 2011, this share averaged at approximately 61.5% for both sectors, which is roughly 20% more than in the

postwar period. This shift in corporate governance along with the rise in real interest rates that was caused by the policies implemented by the Fed after 1979 in order to tackle inflation, created a hostile environment for investments in the NFCB sector (Duménil & Lévy, 2011a, pp. 60-64).

Nonetheless, there are counterarguments against this approach as well. While the increase in the share of dividends is more than apparent in the chart, the problematic accumulation could be ascribed to other reasons. Alternatively, the direction of the causation described above can be reversed, so that the rate of accumulation is declining not because of a change in the patterns of dividend distribution, but because corporations cannot "steer" their funds towards profitable investment channels. According to Michel Husson (2010), the self-financing of investments is the primary concern of corporations, after which they distribute profits that cannot be productively invested in the form of dividends. In this explanation, companies move their capital in search of profits towards the financial sector, because of a lack of effective demand in the goods-producing sectors, in turn due to diminishing real wages in the neoliberal era. Duménil and Lévy (2011b), defend their thesis by arguing that the clear upward trend that is evident in the share of net dividends in ATP after the mid-1970s, cannot be explained by disadvantageous, to the working classes, changes in income patterns that would only gradually affect demand.
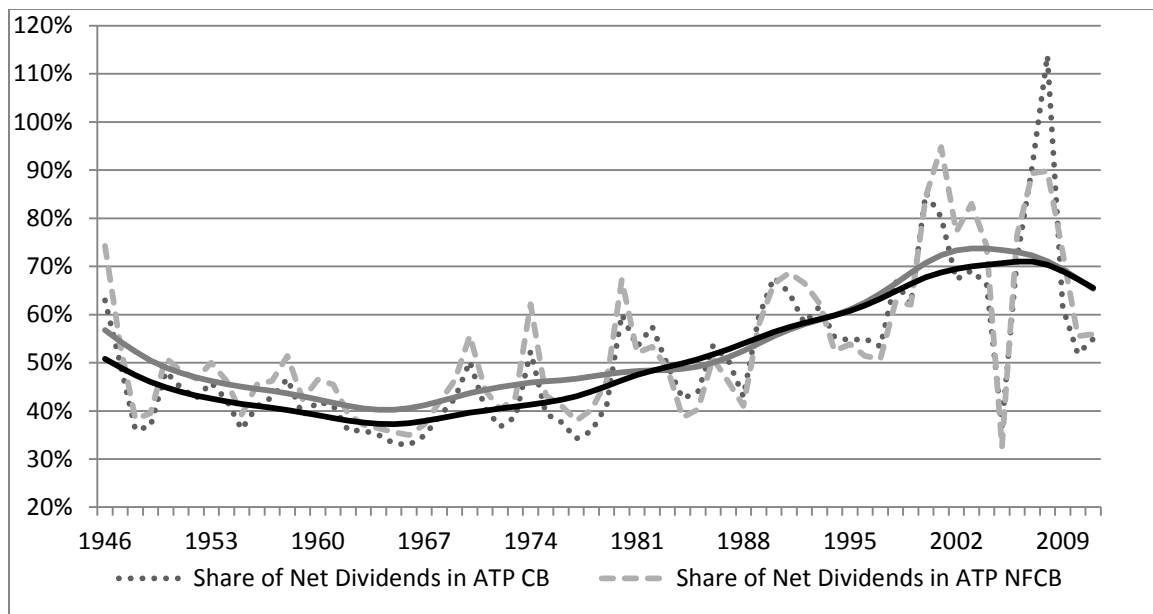
Figure 11. Share of Net Dividends in After Tax Profits, US Corporate Business and Nonfinancial Corporate Business Sector, 1946-2011, Annual Figures with HP-filtered trends[xvi]

In conclusion, this debate requires further research, with more advanced econometric techniques, in order to obtain definite results. Differences between countries will probably affect the result of the outcome considerably. As far as the US case is concerned, we hold that the line of reasoning provided by Duménil and Lévy is

theoretically and empirically more robust than that of Husson, because even if one assumes that the real income of wage-earners (not their share in total income which fell indeed, but the actual wages) declined in the US after 1980, that process was largely counterbalanced by the vast expansion of household debt.

5.4.   Decomposition of the profit rate

To check what influences the profit rate historically, we will decompose it into two parts as has been previously proposed by Duménil and Lévy (1993) and , in order to see which of these two components best explains the variations of the profit rate. The equation that generally describes our broadest profit rate measure is equation (2), $\rho = \Pi/K$. If define Y as the total output of the economy or a specific sector we could rewrite equation (2) as:

$$\rho = \frac{\Pi}{Y} * \frac{Y}{K}, \qquad (2)$$

where Π/Y is the profit share in total output and Y/K is the output-capital ratio, otherwise referred to as capital productivity or maximum profit rate.[28] The first term explains how much income distribution, as the outcome of balance in class power and relations of production (labor productivity growth vis-à-vis wage growth), affects the movement of the rate of profit (Mohun, 2006). The second term, explains the influence of the dynamic development of productive forces and technological innovation (labor productivity growth vis-à-vis capital intensity growth) in the variation of the profit rate (Mohun, 2009). Here we will only visually examine the decomposition of the profit rate in the CB sector. We will use the broadest profit rate measure, the TSVR. In this case, Y is equal to the NVA of the CB sector and K is net stock of corporate fixed assets.

      The profit share fell in the years 1950-1973 by a vast 23%, having reached its peak for the entire postwar period in 1949 at 33.5%. In the following years and until 2001 the profit share stagnated on average at 27.2%. From 2001 to 2011, the profit share displayed an acute upward trend, increasing by 28.5%, to reach an average of 29.2% in the period, not far from the 30% average of the postwar years. The profit share seems to be the main determinant of the vast profit rate decline during the 1970s, although the output-capital ratio is also following the decline in the TSVR but with a lag. After 1980 however, the profit share levels off and has a very slight ascending trend, which cannot explain the fluctuations in the TSVR. During this period, it seems that the output-capital

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[28] If we assume that real wages or employee compensation were equal to zero, this would mean that the entire output *(Y)* of an economy would be profit. Thus, *Y/K* would be the maximum rate of net fixed capital return.

ratio has a bigger role in influencing the movements of the profit rate and has been the factor that drove down profitability again after 1997.
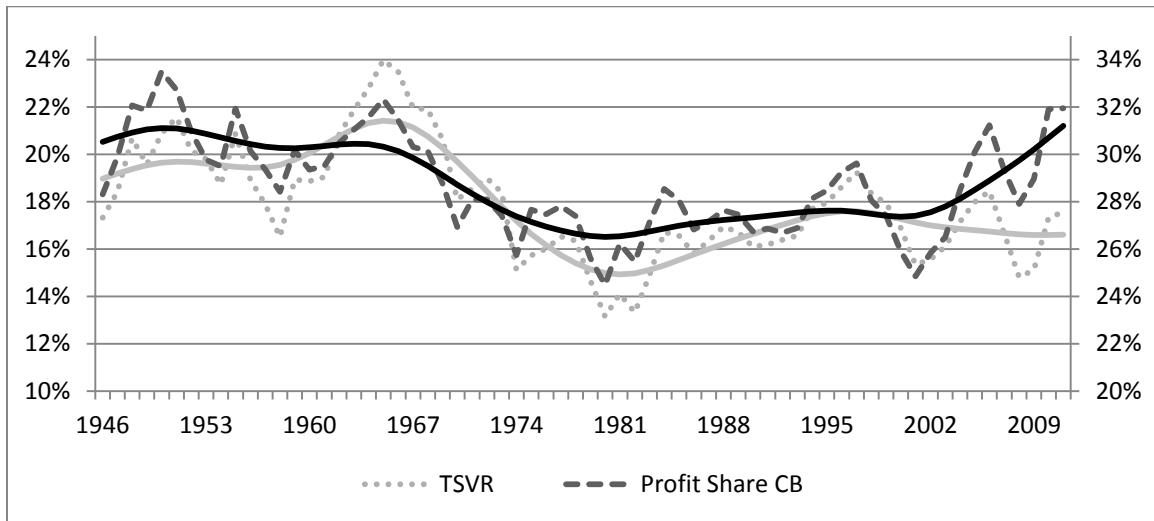
Figure 12. TSVR and Profit Share (secondary axis), US Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[xvii]

Nevertheless, in order to be able to draw some sound conclusions from an analysis of the decomposition of the profit rate, one needs to construct an elaborate econometric model that would incorporate the countertendencies to the LTRPF in variables such as real wage growth, labour productivity growth, exploitation rate, and possibly capacity utilization. Such attempts have been made by Basu and Manolakos (2013), Economakis et al. (2010), Michl (1988), and Mohun (2006, 2009), which are mostly in line with what we have seen only as an indication in the visual investigation of these graphs.
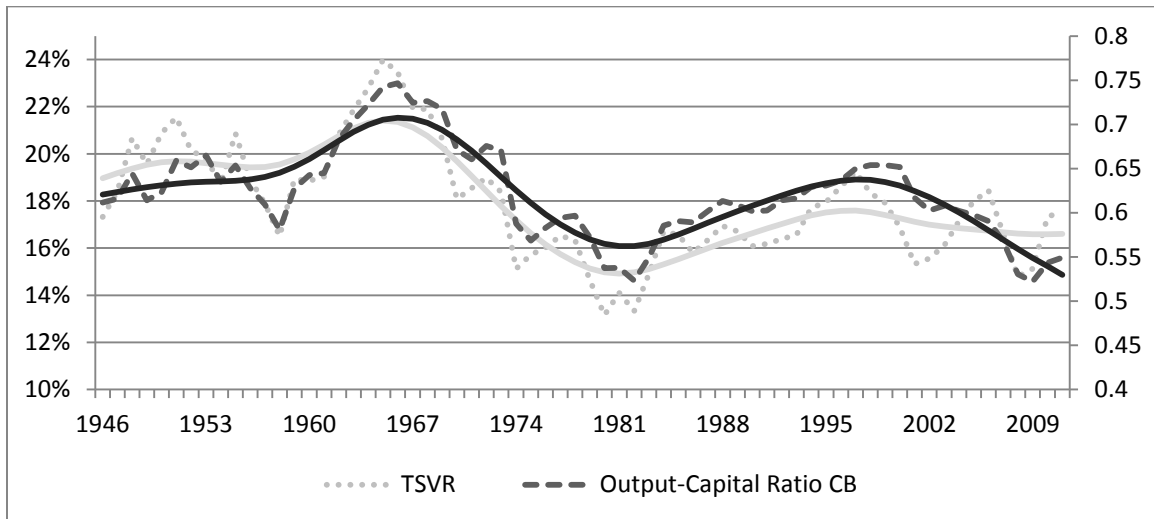
Figure 13. TSVR and Output-Capital Ratio (secondary axis), US Corporate Business Sector, 1946-2011 (Current-Cost Net Stock Valuation), Annual Figures with HP-filtered trends[xviii]

6. Conclusion

While most academic scholars have focused on the unquestionable significance of the financial dimension of the present crisis, this paper has attempted to provide a radical account regarding the ultimate causes of the Great Recession, which focuses on the performance of capitalist production in the US, as it is exhibited by the long-term profitability trends in the corporate business and nonfinancial corporate business sectors.

Every crisis manifests itself in different a way, which is specific of a certain historical economic conjuncture and affected by several exogenous factors. Nevertheless, this does not exclude the possibility to develop a theoretical framework within which one can explain the periodical recurrence of structural crises in the short history of capitalism. That framework is provided by the Marxian concept of the of tendential fall in the rate of profit. This approach is found on the argument that in the process of capitalist development there is a capital-deepening and labor-saving technical bias. Hence, there is a long-term tendency for the organic composition of capital to rise and for the rate of profit to decline. If the countertendencies that moderate the tendency of the rate of profit to fall are exhausted, a structural crisis of profitability will emerge.

Our findings indicate that the CB and NFCB sectors, which comprise the core of capitalist production in the US, have been going through a long-term period of structural incapacity to raise profit rates to the high levels of the pre-1970s crisis. Current-cost profit rate measures have increased in the period between 1980 and 1997 but their revival has only been partial and weak and their trend after that was either slightly descending or trendless. Historical-cost profit rates display a secular declining trend that flattens out after 2001. The only profit rate measure that has significantly recovered after 1980 is the ATPR, mainly due to, favorable to capital, taxation and income distribution policies. The CAGRs between trough-to-trough and peak-to-peak points, which are more reliable because they limit the effect of business cycle fluctuations, are also an indication of the problematic profitability performance in the US.

The organic composition of capital in the NFCB sector suggests that the fall in the rate of profit after 1997 could be attributed to the wide diffusion of ICTs in production, which led to the saturation of the initial productivity gains, in the context of increased international competition in capital-intensive goods. Moreover, from an institutional perspective, business practices of upper management regarding investment policies and distribution of profits between long-term productive investments and short-term shareholder value shifted in favor of the latter. That process intensified the problems of the accumulation process in the NFCB sector that was already slowing down due to falling profitability and further shifted capital towards financial activities with higher risk and bigger profit margins, leading to consecutive asset price bubbles.

Nevertheless, there are no permanent crises. The crisis incorporates the mechanism by which the economy will regain its profitability and enter a new growth

period. This mechanism, which has not always been allowed to act without hindrance by state intervention, is the vast destruction of unproductive capital. The means by which US policy makers and ruling classes decided to tackle the weakness of the economy in the 1980s (wage repression, government cuts, financial expansion) created the conditions for further concentration and centralization of capital in a few supranational corporations that became too big to fail, as their network of activities extends to every corner of world and affects the healthy operation of many other businesses and organizations (suppliers, pension funds, banks etc.). The breakdown of corporations of that size, which have an almost institutional character in the age of neoliberalism, would potentially pull other productive sectors or profitable sections of the economy into a downward spiral. If one takes into consideration, the immense imbalances of the US economy, both on a national and on a global level, this development could imperil the stability of globalized free-market capitalism as a whole, and consequently of the entire socioeconomic and political establishment that supports it. Hence, the means by which the system would regain its profitability and embark upon a new growth path would – at least in the short-term – set its very existence at risk. That largely explains the unwillingness of US policy makers to let the almighty markets decide who will survive and who will not this time. However, without this massive destruction of unproductive capitals, the sustainable resurgence of the once potent US economy as a global imperial force seems rather bleak in the 21st century.

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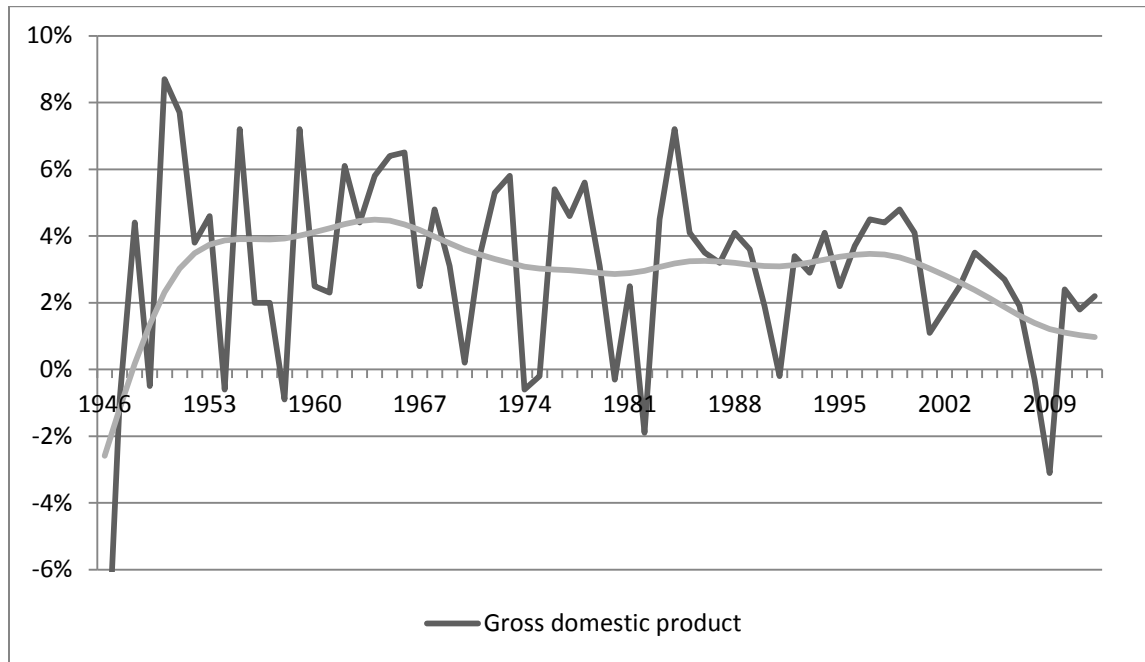
Appendix A

Descriptive Statistics

Figure 14. Percent Change from Preceding Period in Real Gross Domestic Product, US, 1946-2011, Annual Figures with HP-filtered trends[xix]
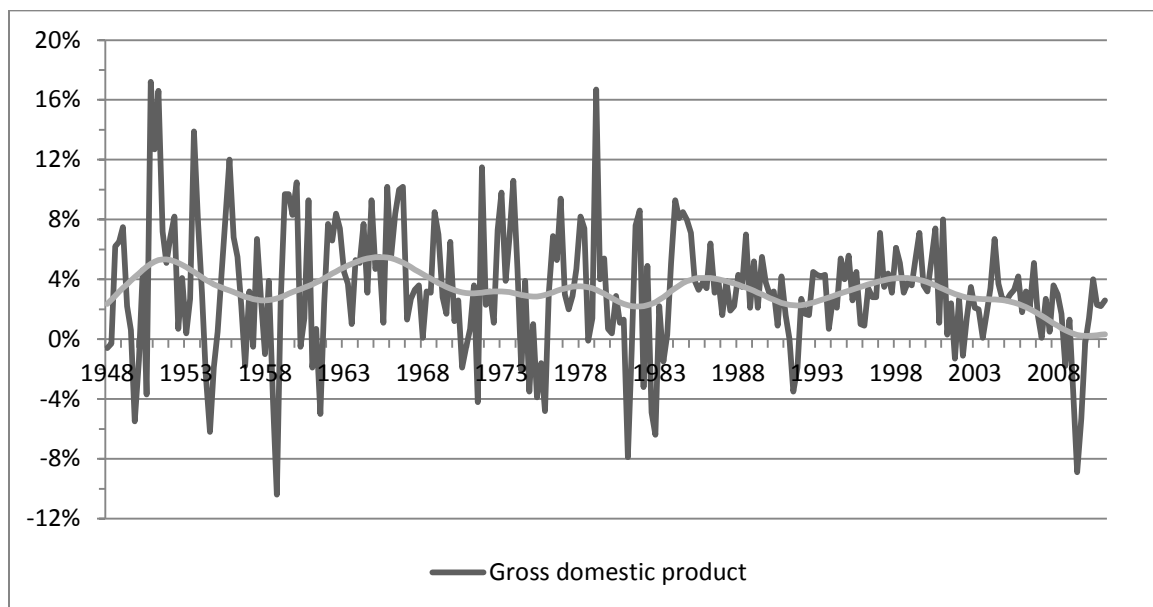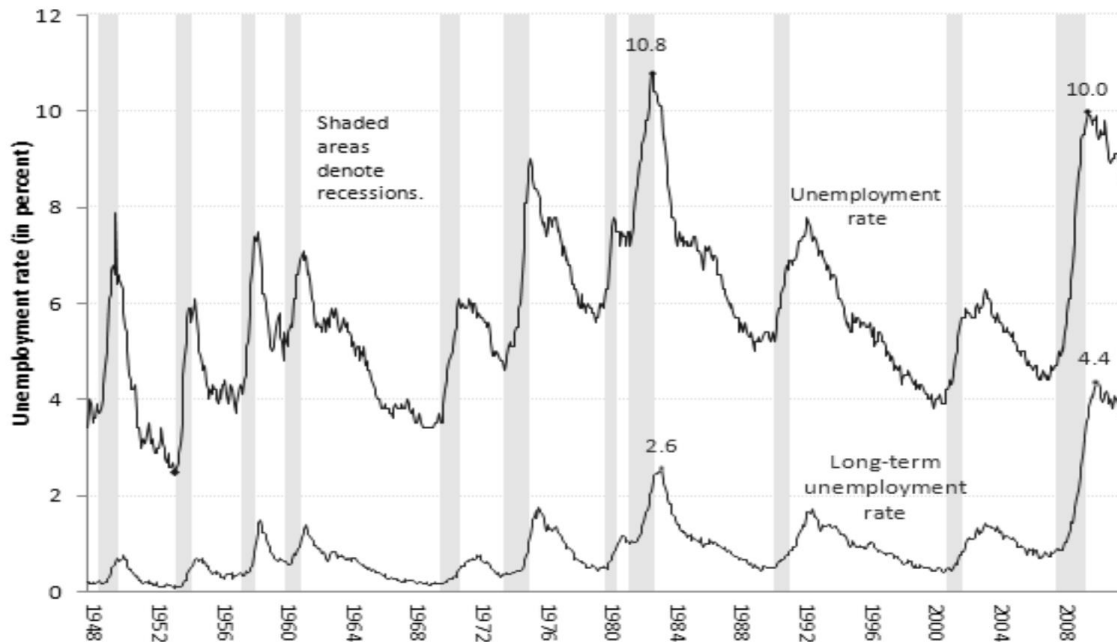

Figure 15. Percent Change from Preceding Period in Real Gross Domestic Product, US, 1947-2010, Quarterly Figures with HP-filtered trends[xx]

Figure 16. Unemployment Rate and Long-term Unemployment Rate, 1948-2011, Monthly Figures (seasonally adjusted)[xxi]

Appendix B (Endnotes)

[i] *"Current-cost estimates of net stocks and depreciation reflect the prices of the given period. For instance, the estimate of the net stock for 1997 reflects the value of the stock expressed in the prices that would have been paid for those assets if they had been purchased at the end of 1997. Similarly, the 1925 net stock estimate reflects the value of the stock in 1925 expressed at the prices that would have been paid for them if they had been purchased in 1925. In principle, the current-cost net stock is the market, or replacement, value of the stock; that is, the value for which the assets in the stock could be bought or sold in that year. In equilibrium, this market value will equal the present value of all expected future services embodied in existing assets. [...] Historical-cost estimates of net stocks are analogous to book value estimates used on company reports and financial statements in that assets are valued at the prices prevailing when they were purchased. Historical cost estimates of the net stock are the depreciated values of these acquisition costs of assets using BEA's assumed depreciation patterns* (BEA, 2003, pp. M-8, M-10).

[ii] The calculation of this figure was done with data from the BEA's NIPA Table 1.14. I divided line 12 (taxes on corporate income) with line 11 (corporate profits with Inventory Valuation and Capital Consumption Adjustment). From these figures, I retrieved the average for the whole period.

[iii] The figures on the CB sector's share in domestic business income were calculated using data from BEA's NIPA Table 1.13. I divided line 3 (corporate business income) with line 2 (domestic business income) and calculated the average for the period 1948-2011. For the calculation of the CB sector's share in business fixed assets I used both the current-cost and the historical-cost valuation of the net stock, BEA's FA Tables 6.1 and 6.3 respectively. The following procedure is the same in both tables, regardless of which method is used to measure net fixed assets. Initially, the business fixed assets were calculated by subtracting lines 8 (nonprofit institutions) and 9 (households) from line 1 (private fixed assets). Then, I divided that figure with line 2 (corporate) to obtain the share. Next, I divided line 4 (nonfinancial) with line 2 (corporate) to acquire the nonfinancial sector's share in the corporate fixed assets. Finally, I used BEA's NIPA Table 1.14 line 19 (NVA nonfinancial corporate business) and line 3 (NVA corporate business) to calculate the NFCB sector's share in the Net Value Added produced by the entire CB sector.

[iv] Figures calculated by me. Data on Net National Income derive from the BEA's NIPA Table 1.7.5 line 16. Data on Compensation of Employees (L) and Wage and Salary Accruals (W) are from the BEA's NIPA Table 1.14 lines 4 and 5 respectively. Finally, data on Total Average Weekly Earnings in private nonagricultural industries from 1966 to 2011 (for production or nonsupervisory workers) stem from Table B–47 of the 2012 Economic Report of the President.

[v] All profit flow measures for the CB sector are from the BEA's NIPA Table 1.14. NVA and L are lines 3 and 4 respectively. NOS is line 8, BTP is line 11 (corporate profits with IVA and CCAdj), and ATP is line 13 (profits after tax with IVA and CCAdj). Data on the Current-Cost Net Stock of Private Fixed Assets are from the BEA's FA Table 6.1 line 2 (corporate).

[vi] Data for the NFCB sector stem from the same sources as Figure 2 (see Endnote v). Profit flows from the BEA's NIPA Table 1.14 lines 19 (NVA), 20 (L), 24 (NOS), 27 (BTP), 29 (ATP). Current-cost net stock of fixed assets from the BEA's FA Table 6.1 line 4 (nonfinancial)., Annual Figures with HP-filtered trends

[vii] The Compound Annual Growth Rates – CAGR were calculated using the following formula:

$$CAGR = (P_t - P_0)^{\frac{1}{n}} - 1,$$

where P_t is the value of the profit rate at the ending year, P_0 is the value of the profit rate at the starting year, and n is the number of years.

[viii] Data on BTP for the CB and FCB sector are from the BEA's NIPA Tables 6.16 A through D lines 2 and 3 respectively.

[ix] Same profit flows as Figure 2. Data on the Historical-Cost Net Stock of Private Fixed Assets are from the BEA's FA Table 6.3 line 2 (corporate).

[x] Same profit flows as Figure 3. Historical-cost net stock of fixed assets from the BEA's FA Table 6.3 line 4 (nonfinancial).

[xi] Same procedure as in Table 2. See vii.

[xii] To calculate the OCC for the NFCB sector, I divided the stock of fixed assets, line 4 (nonfinancial) from the BEA's FA Table 6.1, with L, line 20 (nonfinancial), from the BEA's NIPA Table 1.14.

[xiii] Correlation coefficient (r) calculated with CORREL and PEARSON functions in Excel. The *t-stat* was calculated with the equation 6.12 from Feinstein and Thomas (2002, p. 174):

$$t = \frac{r \times \sqrt{n-2}}{\sqrt{1-r^2}},$$

where *n-2* are the degrees of freedom. To get the *p-stat* one can use the T.DIST.2T (for two-tailed) function and insert the *t-stat* as *x*.

[xiv] Same as xiii.

[xv] To calculate the rate of capital accumulation I divided line 6 (net private domestic investment) of the BEA's NIPA Table 5.2.5 with line 2 (corporate private fixed assets) and line 4 (nonfinancial) of the BEA's FA Table 6.1.

[xvi] To calculate the share of Net Dividends in ATP for the CB and NFCB sector, I used the data from the BEA's NIPA Table 1.14. I divided line 14 (corporate net dividends) with line 13 (ATP CB) and line 30 (nonfinancial net dividends) with line 29 (ATP NFCB).

[xvii] The profit share was calculated by dividing TSV = NVA-L by the NVA produced in the sector. Source: BEA's NIPA Table 1.14 lines 3 and 4.

[xviii] I retrieved the output-capital ratio by dividing NVA of the CB sector with Corporate Private Fixed Assets. Sources: BEA's NIPA Table 1.14 line 3 and BEA's FA Table 6.1 line 2.

[xix] Source: BEA's NIPA Table 1.7.1. Percent Change from Preceding Period in Real Gross Domestic Product, Real Gross National Product, and Real Net National Product, Annual Figures

[xx] Source: BEA's NIPA Table 1.7.1. Percent Change from Preceding Period in Real Gross Domestic Product, Real Gross National Product, and Real Net National Product, Quarterly Figures

[xxi] Source: US Bureau of Labor Statistcs, Labor Force Statistics from the Current Population Survey, Unemployment rate, Series ID: LNS14000000.