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THE MARXIAN "LAW" AND THE CURRENT GREEK ECONOMIC CRISIS

George ECONOMAKIS
UNIVERSITY OF PATRAS

George ANDROULAKIS
UNIVERSITY OF PATRAS

Maria MARKAKI
TECHNOLOGICAL EDUCATIONAL INSTITUTE OF CRETE

ABSTRACT

From a "classical" Marxist perspective, the recent Greek economic crisis is understood as the direct effect of Marxian "law" of the tendency of the rate of profit to fall due to the rising organic composition of capital. The validity of this interpretation is challenged in the following analysis. The central thesis of this paper is that the Greek economic crisis is a crisis of "unevenness" and imperialist exploitation, within the the EU-EMU frame, which has appeared as an underconsumption crisis in the conjuncture of global economic crisis. However, such a kind of crisis implies an indirect manifestation of Marx's "law".

Keywords: Greek economic crisis, Marxian theory of crisis, "Unevenness", Underconsumption

JEL Classification: B14, B51, E11

Introduction

The structural causes of both the recent global economic crisis and of the current Greek economic crisis have raised serious theoretical disagreements (see Mavroudeas 2014, 2015). The present paper focuses on the Greek economic crisis in the conjuncture of global economic crisis. The analysis is mainly restricted to explore the validity of "classical" Marxist interpretation of Greek economic crisis, according to which the rising organic composition of capital (Marx's "law") is not only the fundamental cause of any crisis but also of the contemporary Greek economic crisis. The argument developed in this paper is that such an interpretation ignores the subordinate position of Greek capitalism in the context of European integration. Moreover, the findings of our quantitative investigation suggest that such an interpretation is not empirically confirmed. The central thesis of this paper is that the Greek economic crisis is a crisis of "unevenness" within the "imperialist chain" of EU and manifested as an underconsumption crisis in the conjuncture of global economic crisis.[1]

The structure of the paper is as follows: The next section briefly examines the main points of Marx's theory of economic crises. The third section empirically researches the evolution of the profitability of the Greek economy, using the rate of net capital stock return as an indicator which approximates the Marxian profit rate. Moreover, the net potential domestic product of the Greek economy is estimated, in order to ascertain the underconsumptionist component of the Greek economic crisis. The quantitative investigation covers the period 1960-2015; however, the analysis focuses exclusively on the current crisis, seeking to identify the main factors which (negatively) impact on profitability. In the fourth section a general outline of interpretation of the current Greek economic crisis is given. Conclusions summarize the main findings of the analysis and further discuss the character and causes of the Greek economic crisis.

The Marxian theory of economic crisis: a short consideration

The key points of Marx's theory of economic crises, on the basis of which we will proceed to our investigation of the factors affecting the profitability of the Greek economy, are the following.

[1] An earlier version of this study was published in *Tetradia Marxismou* (see Economakis and Markaki 2016).

The tendency of the rate of profit to fall

"The Law of the Tendencial Fall in the Rate of Profit" and the theory of "overaccumulation of capital", presented in the part III of the 3rd Volume of *Capital*, compose Marx's theory of the tendency of the rate of profit to fall (see Marx 1991).

The Marxian "law"

Developing his theory of *"The Law of the Tendencial Fall in the Rate of Profit"*, in the 13th chapter of the 3rd Volume of *Capital*, "The Law as Such", Marx (1991, 317 ff.) attempted to show that technological innovation – introduced into production by the individual capitalist in the context of economic competition in order to increase labour productivity – could cause a tendencial fall in the profit rate.

Marxian analysis is based on the concepts of technical composition of capital (the quantity in material terms of means of production per unit of living labour) and value or organic composition of capital (the ratio of constant to variable capital, in value terms) (Marx 1991, 241 ff.; Milios et al. 2002, 145). Given that the technical composition of capital increases with accumulation and technological innovation, Marx maintained that if all other factors remain constant, a fall in the profit rate may emerge if the value composition of capital increases due to a more rapid increase in technical composition of capital than the labour productivity it creates (Marx 1991, 317 ff.; Milios et al. 2002, 146).

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

$$p = \frac{s}{c+v} = \frac{s/v}{C/v + 1} \text{ (1)},$$

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

If the technical composition of capital increases more rapidly than labour productivity, C/v rises (Stamatis 1997, 65 ff.). In all cases where this increase is more rapid than the increase in s/v (an increase following technological progress, as the latter, by increasing labour productivity, lowers the price of the – constant or slightly variable – real wage) the profit rate falls (Milios et al. 2002, 146).

However, "the 'law' does not exclude the possibility of the non-existence of these conditions and thus the containment or reversal of the falling tendency in the rate of profit" (ibid., 147).

The over-accumulation of capital

In his previous analysis Marx has considered the numerator of the fraction of equation (1) as constant (given rate of surplus-value), investigating the effect of a rise in the organic composition of capital on the dependent variable (profit rate). In the 3rd section of the 15th chapter of the 3rd Volume of *Capital*, "Surplus Capital alongside Surplus Population" (Marx 1991, 359 ff.), Marx, using the *"ceteris paribus"* method, studies the influence of s/v on p by considering C/v as a constant quantity. Here we find his theoretical notion of the *"over-accumulation of capital"*. Marx argues that surplus-value rate reductions are due to the lack of additional workers (very low unemployment rate) and subsequent (real) wage increases.

Nevertheless, the surplus-value rate depends also on other factors, which Marx "omitted" using his method of abstraction (Milios et al. 2002, 195).

The "realization" problem

Crises are characterised by a "plethora of capital", which "means... overproduction of means of production (...) that can function as capital". The function of capital presupposes the ensuring of a profit rate which corresponds to "the 'healthy' and 'normal' development of the capitalist production process" (Marx 1991, 359, 364). This profit rate is the *"usual profit rate"* (Marx 1969, 494). "Once the rate of profit goes below the usual range, a curtailment of operations on the part of capitalist will set in" (Sweezy 1970, 142). Thus, the realisation problem (underconsumption) is merely a consequence of the profitability problem and a "form of appearance" of crisis: the curtailment of operations on the part of the capitalist class, once the rate of profit goes below the usual rate, appears 'in the form of unsold (consumption and investment) commodities' (Milios et al. 2002, 159, 177, 188).

However, Marx's work is rather ambiguous on the issue of underconsumption. In the 3rd Volume of *Capital* there are extracts that favour an underconsumptionist interpretation of economic crises, considering underconsumption as an independent, or exclusive causal factor of capitalist crises. In these cases Marx ascribes the economic crises to the "antagonistic conditions of distribution, which reduce the consumption of the vast majority of society to a minimum

level", in other words to "the poverty and restricted consumption of the masses" (Marx 1991, 352-53, 615). On the contrary, in the 2nd Volume of *Capital* Marx rejects the underconsumptionist interpretation of economic crises which is based on "the statement that the working class receives too small a proportion of its own product", stressing 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" (Marx 1992, 486-87).

In any case (i.e., either considering the underconsumption as an independent - exclusive causal factor of capitalist crises or as a consequence of falling profitability), the underconsumption reacts negatively upon the degree of capital utilization (underemployment of capital) leading to the (activation or intensification of the) fall of the profit rate, since declining degree of capital utilization means decreasing profit rate (Stamatis 1986, 9).

The above can be perceived modifying the Marxian relation (1). Posing s = Y – v (where, Y = the net product in value terms) and dividing by Y, from the Marxian relation (1) it follows:

$$p = \frac{s}{C+v} = \frac{Y-v}{C+v} = \frac{1-{}^{v}/_{Y}}{{}^{C}/_{Y}+{}^{v}/_{Y}} \quad (2).$$

We assume that C/Y, i.e. the amount of constant capital required to produce one unit of net product, in value terms, expresses the degree of utilization (employment) of constant capital. Let us suppose that underconsumption leads to decreasing degree of utilization (employment) of constant capital (underemployment of capital), that is to an increase of C/Y. We also accept that, *ceteris paribus*, "the poverty of the masses" is expressed in a reduced share of labour in the net product (v/Y). Inasmuch as the reduction of v/Y is overcompensated by the increase of C/Y, the rate of profit (p) will fall.

It must be noted that, in this case, the fall of the rate of profit, could be wrongly attributed to the Marxian "law", if the actual cause of the increase in the (organic) composition of capital is misinterpreted.

Profitability and current crisis of the Greek economy: an empirical investigation

We will investigate the factors affecting the profitability of the Greek economy on the basis of the Marxian theory of economic crises, for the period 1960-2015.

Net capital stock return

Considering that the core of the Marxian theory of economic crises concerns the falling profit rate, the rate of *net capital stock return* is used as an indicator which approximates the Marxian profit rate, and could be the subject of empirical study and measurement (see among other works Duménil and Lévy 2002, 2004; Ioakeimoglou and Milios 2005; Economakis et al. 2010; Economakis et al. 2015a).

Net capital stock return (r) is expressed by the following equation:

$$r = \frac{Y-L}{K} \text{ (3)},$$

where: Y = net product; L = labour compensation; and K = net capital stock.

Equation (3) is a modified version of the Marxian equation (1). Dividing the terms of the fraction (3) with Y, relation (3a) or relation (3b) is derived. Then, dividing the numerator and denominator of (3a) with N, where N is the magnitude of employment (hired labour plus self-employment) relation (3c) is derived.

$$r = \frac{1-L/Y}{K/Y} \text{ (3a)},$$

or

$$r = \frac{\Pi/Y}{K/Y} \quad \text{(3b)},$$

and

$$r = \frac{1-\frac{L/N}{Y/N}}{\frac{K/N}{Y/N}} \text{ (3c)},$$

where: Π = profits; $1 - \frac{L}{Y} = 1 - \frac{L/N}{Y/N} = \Pi/Y$ = profit share in net product, which is related to the Marxian rate of surplus value (see Laibman 2010, 384); L/Y = labour share in net product; $K/Y = \frac{K/N}{Y/N}$ = ratio of net capital stock to net product, i.e., the amount of net capital stock required to produce one unit of net product, that resembles to the Marxian organic composition of capital (see ibid., 384); Y/N = labour productivity; L/N = average labour compensation (average wage); K/N = intensity of net capital stock, or the net capital stock per employee, which resembles to the Marxian technical composition of capital.

Assumptions and restrictions of the analysis

The investigation of the profitability of the Greek economy concerns the total economy, and not only the business-capitalist sector.[2] Therefore, Y refers to the entire economy.

Respectively, L is the sum of the total compensations of employees (of private and public sector) and of inferred compensations of self-employed, since for the latter there is no available data. For the estimation of the compensations of self-employed the number of self-employed is multiplied by the average wage of labour. It is assumed namely that the rewards of self-employed tend to be equal to the equivalent of the average labour compensation; (for the theoretical foundation of this position see Economakis et al. 2010, 476). It must be noted that L includes the remunerations of top managers of private capitalist sector of the economy, part of which are not wages but profits (ibid.). So, the (capitalist) profits are underestimated.

Since Y refers to the entire economy, that is to the capitalist and non-capitalist modes of production (see Economakis 2005), the difference Y - L = Π does not specifically concern the (capitalist) profit. It rather corresponds to a concept of surplus. Therefore, r is in reality a percentage of surplus and not of profit – according to the Marxist terminology. Although Π is wider of (capitalist) profits, we refer to Π as profits for simplification. K, respectively, refers to the entire economy.

The value of the public services is equal to the operating costs of the state apparatus, i.e. profits are not included. Thus, the estimation of r underestimates the (capitalist) profit and rate of profit, given that it includes the compensations of employees in public sector and the non-business capital. However, we suppose that the general trends of profitability variations are depicted.

One particular issue concerns the question of "productive" and "unproductive" labour, in business sector. In this study it is supported that from the standpoint of the capitalist production process, "productive labour" is the labour paid from variable capital. Correspondingly, "production" is any process in which labour-power is exchanged for capital (Economakis et al. 2010).[3] Regarding the non-

[2] It should be noted that a relevant application of fixed capital return in the Greek economy for the period 1961-2004 indicated that the diachronic trends of performance of the overall economy did not differ significantly from those of the business sector (Ioakeimoglou and Milios 2005, 38).

[3] The Marxist bibliography reflects a theoretical contradiction in Marx's work in this subject. In the *Grundrisse* (Marx 1981) as in the 1st Volume of *Capital* (Marx 1990), Marx clearly considers the

capitalist producers, there is no question of "productive" or "unproductive" labour, since "their production does not fall under the capitalist mode of production" (Marx 1978, 407).

The source of quantitative variables of analysis is AMECO. The monetary magnitudes are in Mrd EUROS at constant 2010 prices. Y is the net domestic product and is given at market prices. N is given in thousands of workers. K is the net (fixed) capital stock. In addition to the variables that determine r, the impact of the underconsumptionist component of the crisis is examined. For this purpose, the net potential domestic product (Y*) is needed. Y* is calculated using two different methodologies and is compared with AMECO's "official" estimation. The latter is extracted by the corresponding gross size (at market prices) by subtracting, for each year, capital depreciation. Prices for 2015 are estimates.

Net capital stock return during the period 1960-2015 and the recent Greek economic crisis

Figures 1, 2, 3, 4 and 5 depict respectively, r, Y, K/Y, K/N and L/Y from 1960-2015. Figure 6 shows the relation between Y/N and L/N, for the same period. Finally, Figure 7 depicts the unemployment rate for each year of the period 1960-2015.

As seen from Figure 1, four basic periods can be distinguished during the entire period 1960-2015, two upward and two downward: [4] 1960-73 (upward period) 1974-85 (downward period), 1986-2007 (upward period) and 2008-15 (downward period – the recent economic crisis). The last downward period, that of the recent crisis, seems that is not single but is broken into two distinct sub-periods, one (predominantly) downward (2008-12) and another slightly upward, in the last three years. This can be inferred not only from the changes of r but also from the changes of the other variables of quantitative analysis. However, the significance of this second slightly upward sub-period of the recent Greek economic crisis cannot be asserted from the available data.

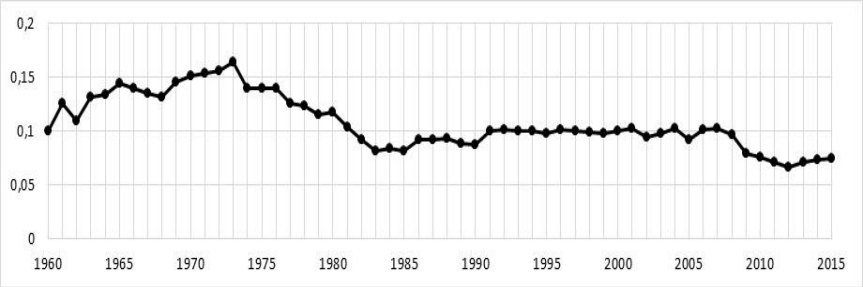
We will restrict our analysis in the recent crisis period. In a first examination of the crisis period 2008-2015 it could be observed the following:

capital in all sectors of economy as equally productive. Nevertheless, in the 3rd Volume of *Capital* (Marx 1991), Marx regards the capital in the commodity circulation process as unproductive. Many Marxist theoreticians embrace the latter viewpoint (see among others Shaikh and Tonak 1994).

[4] Interestingly, the periodization of Maniatis and Passas (2015) for the period 1958-2011, although resulting from a different Marxist methodology, is similar to ours.

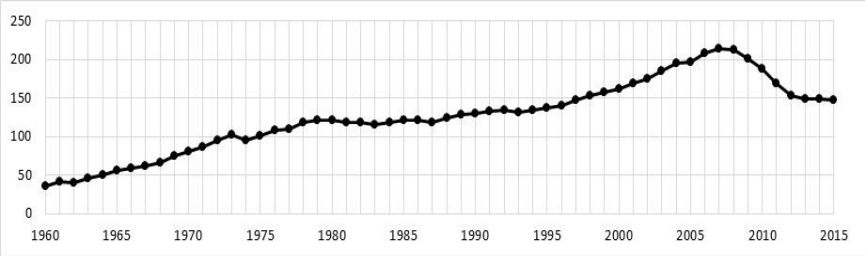
The new period of economic crisis gave in 2012 the lowest level of r for the entire period 1960-2015. However, the last three years, r showed a small increase.

Figure 1: Net capital stock return (r), Greek economy (1960-2015)



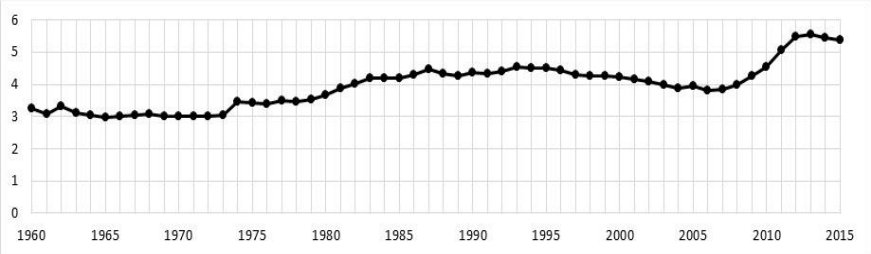
Source: AMECO, own calculations

Figure 2: Net domestic product (Y), Greek economy (1960-2015)



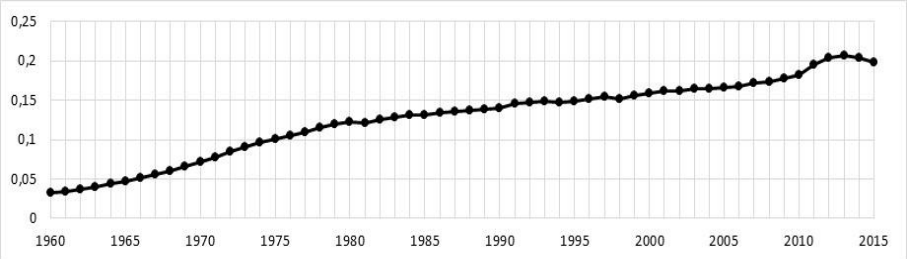
Source: AMECO, own calculations

Figure 3: Ratio of net capital stock to net product (K/Y), Greek economy (1960-2015)



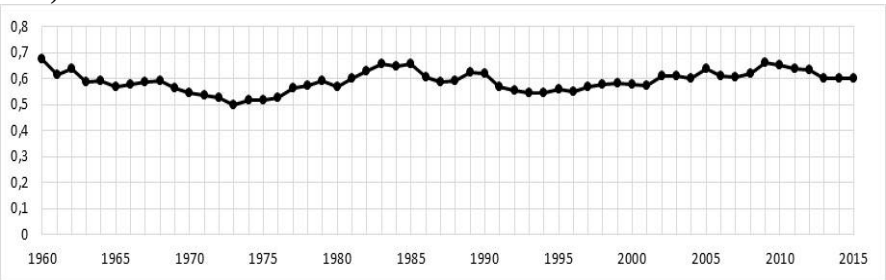
Source: AMECO, own calculations

Figure 4: Net capital stock per employee (K/N), Greek economy (1960-2015)



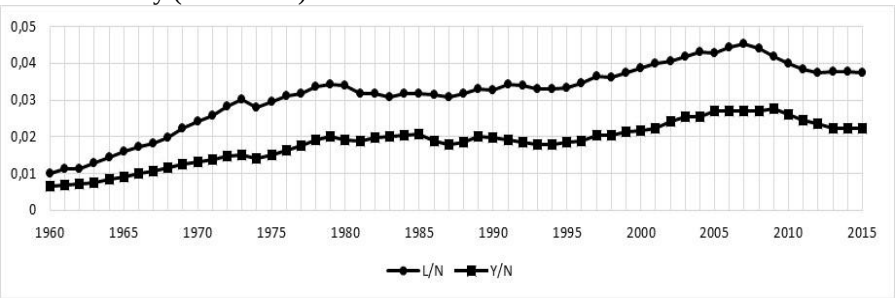
Source: AMECO, own calculations

Figure 5 Share of labour in net domestic product (L/Y), Greek economy (1960-2015)



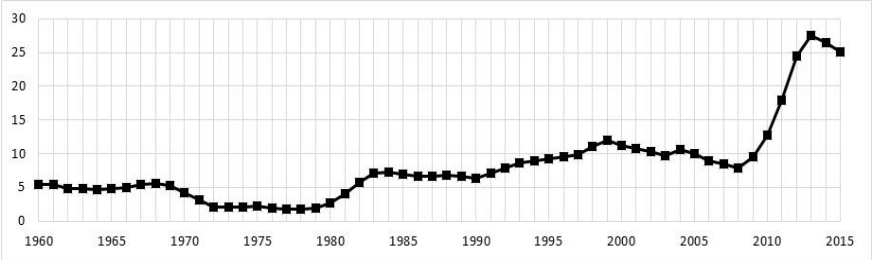
Source: AMECO, own calculations

Figure 6: Productivity of labour (Y/N) and average labour compensation (L/N), Greek economy (1960-2015)



Source: AMECO, own calculations

Figure 7: Unemployment rate (%), Greek economy (1960-2015)



Y, which has received its highest price in 2007, dramatically reduced until 2012. Between 2013 and 2015, it continued to fall, despite a slight rise in 2014. However, it seems that the fall of Y is smoothed. In 2015, Y was at a level slightly below the 1997 level.

Y/N, which has received its higher price in 2007, fell considerably until 2012. In 2015 was at a lower level than in 2012, despite a slight rise during the years 2013-14. It seems, however, that its fall was smoothed the last three years.

K/N not only continued the almost linear rise that followed the whole period 1960-2015, but its rise was intensified during the period of the current crisis, displaying its highest price in 2013. Thus, K/Y displayed a dramatically increase during the recent crisis period, also obtaining its highest price for the whole period 1960-2015 in 2013. Both K/N and K/Y displayed a slight reduction the last two years. Given that K/Y resembles to the Marxian organic composition of capital the following question arise. Is this spectacular rise of K/Y evidence that the rising organic composition of capital (Marx's "law") is the fundamental cause of the contemporary Greek economic crisis? It is not, as it will be shown below.

The first two years of the recent crisis period L/Y increased as L/N continued to increase while Y/N decreased, and after 2009 (when it received its second highest price in the whole period) and until 2013 dropped, which means that the fall of L/N was greater than the fall of Y/N. Thereafter, the fall of L/Y halted, and it is appeared a very small increase, which means a slight reversal of the relation between wages and productivity of labour in favour of wages. In 2015, L/Y was still at a higher level than in 1973 (when the share of labour in net domestic product displayed its lowest price for the entire period 1960-2015), but slightly below 2008 level. Consequently, during the current crisis period the reduction of L/N has exceeded the reduction in Y/N.

The unemployment rate dramatically increased since 2008, and obtained its highest price for the whole period 1960-2015 in 2013. In the last two years the unemployment rate slightly reduced.

The recent crisis of the Greek economy: further investigation of the fall of profitability

According to what we call the "classical" Marxist interpretation of Greek economic crisis, "inadequate profitability remains the fundamental cause of crisis... and this holds true for the case of the Greek economy as well". Thus, the crisis of the Greek economy should be considered in the light of "the Marxian law of the tendency of the rate of profit to fall" (Maniatis and Passas 2015, 107). From a different perspective it is argued that the Greek economic crisis has two structural dimensions, an "internal dimension", which is also reduced to the Marxian "law", and an "external dimension" which concerns the "subordinate position" of the Greek capitalism "in the European imperialist integration" (Mavroudeas 2015).[5]

The validity of the "classical" Marxist interpretation of Greek economic crisis is empirically examined in the following analysis.

One more variable is added for the empirical investigation. The variable Y/Y*, that is the capacity utilization rate (or ratio). This variable could show the potential impact of insufficient demand (underconsumption) on profitability (Cámara Izquierdo 2010, 19 ff.); here on r.

It must be noted that the underconsumptionist component Y/Y* does not express only the Marxian concept of underconsumption as "poverty and restricted consumption of the masses". The insufficient demand – expressed as deviation of Y from Y* – could originate either from the side of capitalists or wage-earners (and self-employed, in our analysis), and vice versa. Thus, for example, for given Y* a rising Y, and consequently a rising capacity utilization ratio of an economy, could be accompanied by a reduction of L (and thus an augmentation of Π, higher than the reduction of L), since $Y = \Pi + L$.

The estimation of Y/Y*: the two methodologies

[5] As it will be argued in the following analysis, the articulation of "internal" and "external dimension" of Greek economic crisis, concerns the manifestation of Marx's law in the "imperialist chain".

Since the estimation of Y*, and thus of Y/Y*, is a matter of theoretical and methodological disputes,[6] in order to have a better insight of the underconsumptionist component of the Greek economic crisis, Y* (and Y/Y*), as already noted, is (are) calculated using two different methodologies. Our results are compared with AMECO's "official" estimation. Our calculations cover the period 1960-2015, while AMECO's the period 1965-2015. Figure 8 depicts the results of these methodologies.

A. The Shaikh-Moudud methodology[7]

Consider the identity:

$$Y = \left(\frac{Y}{Y^*}\right) \cdot \left(\frac{Y^*}{K}\right) \cdot K \text{ (4).}$$

By defining $w = \frac{K}{Y^*}$ as capital-capacity ratio, and $u = \frac{Y}{Y^*}$ as capacity utilization rate, equation (4) is given by using logarithms:

$$logY(t) = logu(t) - logw(t) + logK(t) \text{ (5).}$$

Without loss of generality, it can be assumed that over time the capacity utilization rate u tends to one, so the $logu$ in relation (5) may be considered as residual:

$$logu(t) = e_u(t) \text{ (6).}$$

Assuming that capital-capacity ratio is a function of time t and net (fixed) capital stock K can be approached by the relation:

$$logv(t) = b_0 + b_1 \cdot t + logK(t) + e_w(t) \text{ (7).}$$

Combining relations (5), (6) and (7) the logarithm of Y(t) equals to

$$logY(t) = a_0 + a_1 \cdot t + a_2 \cdot logK(t) + e(t) \text{ (8),}$$

where, $a_0 = -b_0$, $a_1 = -b_1$, $a_2 = 1 - b_2$ and the error term $e(t) = e_u(t) - e_w(t)$.

[6] The discussion of these disputes exceeds the present study aims.
[7] See Shaikh and Moudud 2004.

Equation (8) implies that $logY$ and $logK$ are correlated. Moreover, from equation (6), the long-run value of net actual domestic product (Y) is the net potential domestic product (Y*). By using this estimate of Y* the capacity utilization rate $u = \frac{Y}{Y^*}$ and the capital-capacity ratio $w = \frac{K}{Y^*}$ can be approximated.

B. The AMECO/Eurostat-like methodology[8]

Assume a Cobb-Douglas type production function

$$Y(t) = A \cdot N(t)^{\alpha} \cdot K(t)^{\beta} (9),$$

where, $N(t)$ is the magnitude of employment (thousands of workers, hired labour plus self-employment) and $K(t)$ is the net (fixed) capital stock.

By applying algorithms equation (9) becomes

$$logY(t) = logA + \alpha \cdot logN(t) + \beta \cdot logK(t) \ (10).$$

Moreover, assuming constant returns, i.e. $\alpha + \beta = 1$ relation (10) is modified to

$$log\frac{Y(t)}{N(t)} = logA + (1-\alpha) \cdot log\frac{K(t)}{N(t)} \ (11).$$

In relation (11), A and α can be approximated using linear regression. So, the estimate of net potential domestic product (Y*) is given using

$$Y^*(t) = A \cdot LF(t)^{\alpha} \cdot K(t)^{\beta} \ (12),$$

where, LF[9] is the labour force (employed and unemployed, in thousands).

Now, the capacity utilization rate $u = \frac{Y}{Y^*}$ can be approximated using $Y(t)$ from equation (9) and $Y^*(t)$ from equation (12).

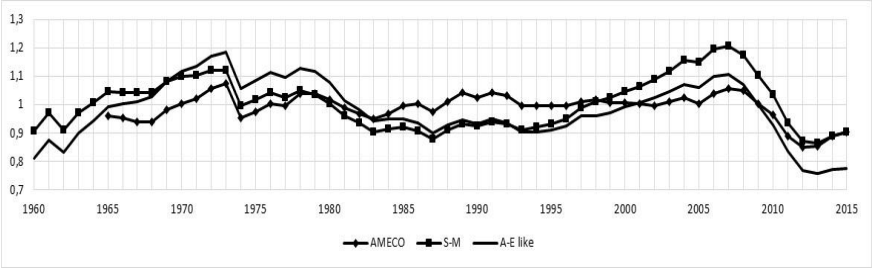
As it can be seen from Figure 8, despite the differences that appear in the estimation of the capacity utilization rate, during the examined period, there are

[8] See among other works, Havik et al. 2014.

[9] In AMECO-Eurostat's methodology potential employment equals N* = LF (1-NAWRU) (Havik et al. 2014, 10). "The EC uses the term NAWRU (non-accelerating wage rate of unemployment), the *W* instead of the *I* indicating that the wage inflation rather than the price inflation features in the Phillips curve" (Gechert et al. 2014, 1; see also Orlandi 2012). In our methodology N* = LF.

common findings in all three methodologies used. At first, all the estimations coincide in the dramatic fall in Y/Y* after 2007. This means that the 2008-15 crisis emerges as a severe underconsumption crisis. Moreover, regardless of the methodology used, there is a small increase of Y/Y* the last years: the last three years in AMECO's estimates and the last two years in the other estimations. This small increase of Y/Y* fits with the finding of the slightly upward period the last three years.

Figure 8: Capacity utilization rate, Greek economy (1960/65-2015)



Source: AMECO, own calculations

Comparing the changes of variable

Table 1 depicts the changes in r and in the other variables of the analysis (Y, Y/N, L/N, K/N, Y/Y * and K, N) during the eight years of crisis (2008-2015).

Table 1: Percentage changes (%) Greek economy (2008-2015)

r	Y	Y/N	L/N	K/N	Y/Y^*_{AMECO}	Y/Y^*_{S-M}	$Y/Y^*_{A-E\ like}$	K	N
-24.50	-30.58	-15.26	-17.00	15.88	-13.66	-23.05	-27.74	-5.07	-18.08

Source: AMECO, own calculations

Given the relations (3a), (3b) and (3c), and table's 1 data, it could be inferred that:

a. Net capital stock return (r) does not fall due to the reduction in the numerator of relations (3a), (3b) and (3c) (see also the previous analysis). On the contrary, the numerators of these relations rise. More precisely, the average wage (L/N), not only is reduced, but, is reduced more than the decrease in labour productivity (Y/N) – the decline of which is mainly due to the decrease of net domestic product (Y) which exceeds the reduction of the number of employees (N). Consequently, the share of labour in net domestic product (L/Y) is reduced and correspondingly the share of profits in net domestic product (Π/Y) is augmented. Therefore, the recent crisis of the Greek economy is not linked to the fall of Marxian surplus value rate

(theory of "overaccumulation of capital"). On the contrary, the defeat of labour (as it is manifested in the decrease of its share in net domestic product, in circumstances of dramatic rise in unemployment) strengthens (*at first sight*) profitability.

b. Inasmuch as the numerators of relations (3a), (3b) and (3c) rise, the reduction of r is due to the (greater) increase of the denominators of these relations – which refers either to the Marxian "law" of the falling profit rate due to the rising organic composition of capital or to the activation of underconsumptionist component of the crisis that results in capital underemployment. Indeed, K/N increases, while the productivity of labour diminishes, which also means that K/Y rises – and it rises dramatically, as already noted. However, K/N increases while K decreases. K/N increases only because N decreases more than K. Also, K/Y increases only because K decreases less than Y.

c. The above indicate much capital in relation to the declining employment and the falling product. The significant reduction in capacity utilization rate (Y/Y*), that is the activation of underconsumptionist component of the crisis,[10] triggers, first of all, Y and N reduction, leading to decreasing capital utilization (capital underemployment), and, consequently to K reduction. The reduction of the latter expresses the activation of capital destruction process into the crisis, which intensified with the development of the crisis – as a condition for its overcoming (Marx 1991).[11] So, in the given technology, the increase in capital composition (K/Y and/or K/N) indicates only capital underemployment – due to insufficient demand – and consequently the recent Greek economic crisis is not linked causally to the Marxian "law". The increased K/Y ($=\frac{K/N}{Y/N}$) over-compensates the reduction of L/Y ($=\frac{L/N}{Y/N}$) (or equivalently the increase of Π/Y) and r decreases.

The underconsumption, however, is only the form of appearance – in the conjuncture of global economic crisis – of Greek capitalism's deeper problems, i.e. of the model of its development, mainly in the 2000s. This issue will be discussed briefly in the following sections.

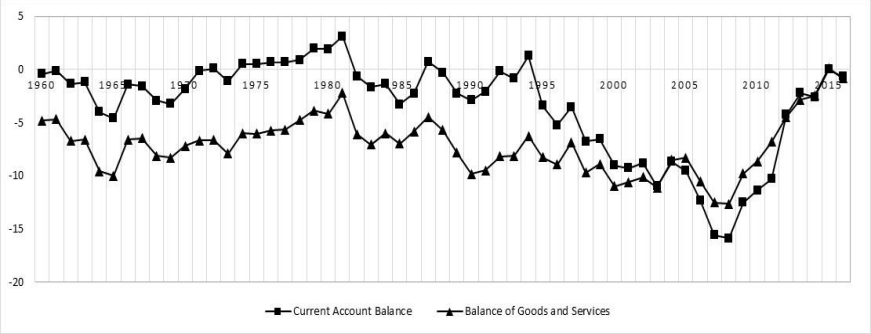
[10] If we do not take into account the small increase of Y/Y* the last years, the effect of underconsumptionist component of the crisis is more powerful.

[11] If we look at the first (predominantly downward) sub-period of crisis (2008-2012) K also decreases, although considerably less: -0,42% (AMECO, own calculations). The further reduction in K reflects the ongoing depression and the intensification of capital destruction into the crisis.

An outline of interpretation of the current Greek economic crisis: development with deficits in the 2000s and crisis

As seen in Figure 9 the balance of goods and services is constantly negative for the entire period 1960-2015, reflecting Greek economy's chronic competitiveness problem. From the same figure it can be observed that after 1981 (country's entry to the then EEC), and especially from the mid-1990s to 2008, the balance of goods and services deteriorated further.

Figure 9: Current Account Balance and Balance of Goods and Services as a percentage of GDP, Greek economy (1960-2015)



Source: AMECO

It must be noted that the Greek negative net national saving[12] and the high public debt[13] negatively affect the current account balance ("twin deficits") (Economakis et al. 2015a, 130-32). However, the determinant factor of the serious current account deficit is the low international competitiveness of the Greek economy, as recorded by the balance of goods and services.[14]

[12] *"[N]et national saving*, i.e. after deducting depreciation, as a percentage of GDP was negative or virtually zero during most of the last decade, reaching such lows as -5.1% of GDP in 2008 and -8.1% in 2009 (compared with 5.8% in 2008 and 3.4% in the October 2008-September 2009 period in the euro area as a whole)" (Bank of Greece 2010, 115-16).

[13] The consolidated debt of the general government, as a percentage of GDP, increased from 107.3% of GDP in 2005 to 180.2% (provisional data) in 2015 (Bank of Greece 2016, 158-59, tables VI.7 and VI.8).

[14] According to Lapavitsas et al. (2010, 16), "[p]eripheral countries [Greece, Portugal and Spain] lost competitiveness relative to the core, and thus faced current account deficits which were financed from abroad. The current account deficits had little to do with the public sector of peripheral countries, which did not generate systematic financial deficits, even though it has often been described as profligate and inefficient".

The improvement in the current account balance since 2008 is mainly due to the improvement in the goods and services balance. This improvement is not due to the improvement in the international competitiveness of the Greek economy, but it is the result of the depression which led to a significant reduction in the imports of goods and services, by 33.33% (at constant 2010 prices), during the period 2008-2015, which exceeds the reduction of exports of goods and services, by 2.25% (at constant 2010 prices), during the same period (AMECO, own calculations).

Therefore, the crisis of the Greek economy manifests itself in an economic environment of increasing current account deficit, which is mainly due to the lack of competitiveness of the Greek economy within the EU-EMU frame – while the depression, with the consequent reduction of imports, restricts this deficit.

However, since the early 2000s and before the global economic crisis, the Greek economy experienced high growth rate. Between 2000 and 2007, the net domestic product increased (in constant 2010 prices) by 29.91% (AMECO, own calculations). As it can be seen from Figure 8, during this period – regardless of the methodology used – capacity utilization rate (Y/Y*) considerably increases, and in 2007 it is well above the one (see also Oikonomou 2010, 7).

Consequently, the period of "over-growth" 2000-07 was also a period of high current account deficit,[15] mainly due to the high deficit in the balance of goods and services (see also Figure 9), which created needs for augmenting external borrowing.[16]

More precisely: The economic growth during the 2000s emanated mainly from the sectors of non-tradable goods and services (Oikonomou 2010, 7). As seen from Table 2, the ratio of tradable to non-tradable goods and services is higher in the EU-27 against Greece for the period 2000-10, which has a ratio less than one.

Thus, after Greece's entry into the Eurozone, the Greek economy based its development on the growth of productive sectors not exposed to the international competition – comparatively more than the EU-27 as a whole. Therefore, the

[15] In 2000-08, the financing of current account deficit relied on international capital market funding, mainly through the issuance of bonds and Treasury bills – that create debt (Bank of Greece 2012, 96; Lapavitsas et al. 2010, 9, 11, 13).

[16] The gross external debt (of private and public sector) is powered by current account deficit. The Greek economy exhibits a serious deterioration of the gross external debt before the recent economic crisis; 138.25% of the GDP in 2007 (Bank of Greece 2013, 111, table VIII.5). In 2015 it is estimated at 251.4% of GDP (Bank of Greece 2016, 133, table V.13).

model of development of the Greek economy during the 2000s neither presupposed nor led to the improvement of its international competitive position.

Table 2: Ratio of Tradable* to Non-Tradable** goods and services (Gross Value Added, constant prices 2005)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EU-27	1.072	1.058	1.041	1.031	1.028	1.019	1.026	1.039	1.019	0.977	0.992
Greece	0.866	0.797	0.777	0.716	0.695	0.693	0.666	0.648	0.661	0.689	0.601

* Agriculture, Forestry and Fishing, Mining and Quarrying, Manufacturing, Accommodation and Food Services, Financial and Insurance Activities and Other Service Activities.
** Energy, Constructions, Storage-Transportation-Telecommunications, Trade Services, Public Sector, Other Services
The classification is based on NACE Rev. 1.1; the distinction between tradable and non-tradable goods and services is based mainly on Gibson (2010).
Source: Authors' calculations using Eurostat's data

As a result, the rising incomes in the sectors of non-tradable commodities augmented the demand of tradable from aboard (Oikonomou 2010, 45-46, 58; Gibson 2010, 337 ff.). Yet, imports are mainly characterized by higher income elasticity of demand against domestically produced and exported commodities (Bank of Greece 2003, 32; Bank of Greece 2009, 121; Gibson 2010, 344). This "reflects… the inability of domestic supply to meet *domestic and foreign demand in terms of both composition and growth"* (Bank of Greece 2009, 121) – which is an expression of the "low competitiveness" of the Greek economy[17] (see also Oikonomou 2010, 46) and of production-trade structure dissimilarity between Greece and its international trade competitors (mainly EU countries) (Economakis et al. 2014, 179), stated otherwise as "disequilibrium between the structure of supply and the composition of demand" (Furtado 1964, 170).[18]

Simultaneously, the high income elasticity of demand for imported (industrial in general) goods is combined with low price elasticity of demand for these goods (Bank of Greece 2010, 232). Therefore, the economic growth was accompanied by increasing import payments (see also Bank of Greece 2000, 209), especially in the absence of any kind of (trade or exchange rate) protective policy within the frame of EU-EMU. GDP was increased, inasmuch as the increase in demand for tradable commodities from aboard was outweighed by the increase in domestic demand for non-tradable. Consequently, the very model of Greek capitalism,

[17] This is a chronic structural weakness of the Greek economy, which however deteriorates after Greece's entry in the EU.
[18] For a detailed analysis see Economakis et al. 2014.

within the frame of EU-EMU, led to an economic growth that was accompanied by high external deficit.[19]

The significant reduction in the cost of borrowing in the 2000s formed the basis for this model of development (see also Pelagidis 2010). This reduction was the result of the single monetary policy, which was less tight for Greece than it was for most countries of the Eurozone, due to differential inflation which entails lower real interest rates (Oikonomou 2010, 8). Thus, the short-term real interest rates in the 1990s were for Greece at an average of 5.4%, while after 2000 came close to 0% – becoming for long periods even negative. These conditions led to the over-expansion of (private and public) domestic lending, further enhancing expansion of domestic demand (Milios 2011).[20]

Economic growth with high current account deficit reached its limit in 2007 (see Oikonomou 2010, 8), when the onset of global economic crisis blocked this model of development. In the conjuncture of global economic crisis, as the financial sphere entered a process of reassessment of credit risks, the transfer of "savings" from the European "centre" to the European "periphery" stopped (see Milios 2011). From 2009, "when the sovereign debt crisis unfolded in Greece, as the country was shut out of international capital markets and the spreads on Greek government bonds were high, the current account deficit was financed by borrowing obtained under the support mechanism for the Greek economy" (Bank of Greece 2012, 96).The weakening of domestic and external demand due to the global crisis has already led to the reduction of domestic product in 2008. The ensuing implementation of the Memoranda's austerity measures of the "support

[19] The official position, as it is expressed by the Bank of Greece (2010, 16-18), supports that the high current account deficit, is a result of the "losses in competitiveness" of the Greek economy. These are mainly related to the rigidities in labour market that led to wage increase and losses in price competitiveness. However, the "international competitiveness" of a national economy is not a matter of "price" or "cost" competitiveness. It is mainly dependent on "non-price" factors such as technological opportunities, technical infrastructure, and production capacities, which constitute the productive structure and the related "externalities" (see Ilzkovitz et al. Internet: 2; Nurbel 2007, 65). Furthermore, Kaldor's post-war findings indicate that the countries that had the greatest increase in their market share also had the highest decline in price competitiveness (i.e. the highest increase in unit labour costs) (Felipe and Kumar 2011, 3-4). This is known as *"Kaldor's paradox"*. Moreover, the Greek economy was an economy of low wages within the EU-15 frame – even before Memorandums. During the period 2000-2015, the Greek average annual wages (in 2015 USD PPPs and 2015 constant prices) remained the lowest in the EU-15, with the exception of Portugal (OECD. Stat Extracts).

[20] It could be said that the Greek model of development during 2000s was based on "over-consumerism" and was manifested primarily as "high propensity to consume imported goods" (Bank of Greece 2011, 8). This "over-consumerism" of imported goods was related to the "intensely consumerist type of the Greek economy" (Fotopoulos 2010, 51), and hence to the low level of national saving (see also Economakis et al. 2014, 185-86).

mechanism" blocked capitalist reproduction displaying underconsumption crisis and deep depression that continues until today. Thus, the Greek economy emerged as EMU's chief "weak link".

Conclusions: crisis of "unevenness" and imperialist exploitation

The above analysis shows that the current crisis of the Greek economy cannot be understood as a direct result of the Marxian "law" of the tendency of the rate of profit to fall due to the rising organic composition of capital. Besides, an interpretation of the crisis of the Greek economy on the basis of Marxian "law" cannot explain why especially in the Greek case the "law" was manifested with such severity.

Greek economic crisis began with the breaking of the "bubble" of "over-growth" in the 2000s under the conditions of global economic crisis, and it is linked to the low competitiveness of the Greek economy within the EU-EMU frame expressed as persistent deficit in the current account balance (owing mainly to the deficits in the balance of goods and services) and augmenting external borrowing. Thus, the Greek economic crisis is related to the subordinate position of the Greek capitalism in the "imperialist chain" of EU-EMU.

It has been shown (Economakis 2014; Economakis et al. 2015b) that the subordinate position of Greek capitalism within the EU-EMU frame is a result of its "extraverted" model of development, which leads to systematic transfers of value to the imperialist countries – expressed as persistent deficits in the balance of goods and services. The Greek economy is an "extraverted" economy of the EU, since it displays all the "structural characteristics" of "extraversion": relatively weak domestic sectoral productive linkages; strong specialisation; relatively low level of industrial and technological development (and productive structure dominated by small enterprises); "unfavourable" relative income elasticities of demand (i.e., income elasticities of demand for Greek economy's exports against those for its imports); relatively low international competitiveness – which is expressed from unfavourable terms of trade and persistent deficits in the balance of goods and services,[21] until the recent crisis. The dissimilarity of trade-production structure between the Greek economy and

[21] Thus, "over-consumerism" is an expression of "extraversion". In this connection see Fotopoulos, 2010, 50-54; Economakis et al. 2014.

its international trade competitors (mainly EU countries) is a manifestation of Greek's economy "extraversion" within the EU.[22]

Consequently, the "extraverted" model of development of Greek capitalism leading to systematic transfers of value to the imperialist countries formed the foundations of the current Greek economic crisis in the conjuncture of the global economic crisis. From this point of view, Greek economic crisis is a crisis of "unevenness... in world economy" (Lenin 2010, 118).

However, a crisis of "unevenness" implies an *indirect* manifestation of Marx's "law".

Marx analysing the factors that counteract the manifestation of the "law" of the tendential fall in the profit rate writes on foreign trade:

> Capital invested in foreign trade can yield a higher rate of profit… because it competes with commodities produced by other countries with less developed production facilities, so that the more advanced country sells its goods above their value, even though still more cheaply than its competitors. ... The same relationship may hold towards the country to which goods are exported and from which goods are imported: i.e. such a country gives more objectified labour in kind than it receives, even though it still receives the goods in question more cheaply than it could produce them itself (Marx 1991, 344-45).

As Grossmann (1992, 172) points out,

> the gain of the more advanced capitalist countries consists in a transfer of profit from the less developed countries. … It is not a question of the realisation of surplus value but of additional surplus value which is obtained through competition on the world market through unequal exchange, or exchange of non-equivalents.

This is a process of value (surplus value) extraction, i.e. imperialist exploitation in the sphere of circulation, as a consequence of uneven development in the "imperialist chain". Through value appropriation the more advanced (imperialist) countries "shed" their crisis trends to the less advanced. Correspondingly, the less advanced countries experience potential crisis trends that brake out as

[22] The dissimilarity of production-trade structure between the Greek economy and its trade competitors means that the Greek economy is a subject of value extraction mainly through the deterioration of its terms of trade (Economakis et al. 2014, 198).

persistent trade deficits. Thus, the "unevenness" in the "imperialist chain" is one of the factors counteracting on the manifestation of the Marxian "law" of the tendential fall in the profit rate due to the rising organic composition of capital observed in more advanced countries.

Given the above it could be inferred that, the Greek economic crisis is the result of the operation of Marx's "law" in the "unevenness" of the EU-EMU "imperialist chain", and thus it is a crisis of "unevenness" and imperialist exploitation appeared as underconsuption crisis in the conjuncture of global economic crisis.

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