THE GREEK CRISIS IN RETROSPECT:
THE RATE OF PROFIT APPROACH

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Manuscript received 03 February 2022; accepted 02 May 2022.

ABSTRACT

The Greek economy is in crisis since the fourth quarter of 2008. This paper explores the crisis and its severe intensity by decomposing and comparing the Greek, Dutch, and Portuguese profit rates. Specifically, profit rates are broken down into: 1) the capacity output ratio, 2) the profit share, and 3) the rate of capacity utilization. The comparison shows that the Greek crisis is part of the global crisis that began in 2008 and its intensity is the result of the degradation of the competitive position of Greek capitalism following 1970. The latter is reflected in massive de-industrialization, persistent current account deficits, and an increasing ratio of non-tradable to tradable commodities. These structural characteristics of the Greek economy reduce the effectiveness of "countervailing tendencies" like wage reductions in restoring profitability and growth. In the EU environment this means that the free trade —fiscal consolidation policies increase the gap between weak economies, like Greece's, and the economies of the EU "core" putting the whole project in jeopardy.
Keywords: Capitalist crisis, rate of profit, capitalist competition, absolute advantage.
JEL Classification: E21, E22, F16, N24, O47.

http://dx.doi.org/10.22201/fe.01851667p.2022.321.82097

LA CRISIS GRIEGA EN RETROSPECTIVA: EL ENFOQUE DE LA TASA DE GANANCIA

RESUMEN

La economía de Grecia está en crisis desde el cuarto trimestre de 2008. En este artículo se explora la crisis y su intensidad severa al descomponer y comparar las tasas de ganancia de Grecia, Holanda y Portugal. De forma específica, las tasas de ganancia se descomponen en: 1) la razón capacidad/producto, 2) la participación de las ganancias y 3) la tasa de utilización de la capacidad. La comparación muestra que la crisis griega es parte de la crisis global que inició en 2008 y su intensidad es el resultado de la degradación de la posición competitiva del capitalismo griego posterior a 1970. Esto último se refleja en la gran desindustrialización, los persistentes déficits en cuenta corriente y la creciente razón bienes no comerciables/bienes comerciables. Estas características estructurales de la economía de Grecia reducen la efectividad de las "tendencias contrarestantes" como las reducciones de salarios para restaurar la rentabilidad y el crecimiento. En el ambiente de la Unión Europea (UE) esto significa que las políticas de libre comercio y consolidación fiscal incrementan la brecha entre las economías débiles, como la de Grecia, y las economías "principales" de la UE, lo cual amenaza todo el proyecto de unificación.

Palabras clave: crisis capitalista, tasa de ganancia, competencia capitalista, ventajas absolutas.

Clasificación JEL: E21, E22, F16, N24, O47.

1. INTRODUCTION AND SUMMARY

The fourth quarter of 2008 was the first negative quarter of Gross Domestic Product (GDP) growth for the Greek economy in 13 years. It was followed by almost 40 consecutive negative quarters, the longest streak in the history of market economies in peacetime. Overall, from 2008 to date Greece has lost 36% of its GDP and its debt/GDP ratio has gone from 120% in 2009 to 236% at the end of 2020 (Organization for Economic Cooperation and Development, OECD, selective indicators https://data.oecd.org/greece.htm). The duration and intensity of the crisis require a closer look at the Greek case. This is not simply a matter of

economic history. Presently, the crisis and its consequences overshadow everything else in the Greek society almost 13 years after 2009.

Looking back at the post-war Greek economy will prove helpful in understanding why the present events are so dramatic. It will reveal both the dynamics of economic fundamentals as well as the impact of economic policy. The latter is essential because Greece underwent three European Union-European Central Bank-International Monetary Fund (EU-ECB-IMF) austerity programs and a state bond haircut of at least 105 billion during the last 12 years[1]. This is attempted in sections 2 and 4.

The analytical framework applied for this inquiry originates from the Classical-Marxian tradition. Specifically, the theory of crisis (Grossman, 1992) and the theory of "real competition" (Shaikh, 2016; Tsoulfidis and Tsaliki, 2005). For this reason, besides the National Income Product Accounts (NIPA) (section 2) I will apply certain Classical/Marxian} categories (sections 3 and 4). Marxist categories for output and capacity utilization will reveal the nature of the crisis and the difference in its intensity between Greece and certain countries of the Eurozone (the Netherlands and Portugal). The only drawback is that this data stops in 2019 and does not consider the years of the pandemic. The data comes from the Ameco, PENN 10, and the OECD databases, save for the breakdown of the GDP by branch of activity where I used tables from the local statistical agencies of Greece, Portugal, and the Netherlands. The latter were needed to calculate the Classical category of output (Q) for each country.

The argument developed here-below is that the Greek crisis is part of the "1st Great Depression of the 21st Century" (Shaikh, 2011). Its intensity, however, results from the further degradation of the competitive position of Greek capitalism during and following the great stagflation of the 1970s and from the early to mid-1980s. The latter was aggravated

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[1] The haircut is referred to as Private Sector Involvement (PSI). It took place in 2012 and involved banks and financial institutions in general, the Greek state pension plans, and the public. It exempted the so called "European official sector" (EU countries, local Central Banks, and the ECB). Public debt was relieved from bonds adding to a total of at least 105 billion euros in nominal value. Some people raise the debt relief amount to 115 billion. They add 10 billion loaned by the EU to buyback Greek bonds of 30 billion in nominal value independently of the PSI. In summary, if the PSI had not taken place the Greek debt would be at least 491 (386 + 105) billion euros at the end of 2020 (other things remaining equal) and not 386 billion.

during the last 30 years from Greece's participation in the European Union and following 2000 in the Eurozone. In summary, the Greek crisis has a "global crisis component" and a "competitive/structural component". This is outlined in section 4 and developed further in sections 5 and 6.

The austerity programs applied in the Greek economy ignored the "crisis component". The IMF suggested that the elimination of fiscal imbalances would restore the competitive position of Greek capitalism and lead the economy to sustainable growth (Thomsen, 2019). Here I argue that the causality runs the other way around. Fiscal imbalances are the result not the cause of the crisis. The increase of the Greek debt and the debt/GDP ratio despite the austerity programs is a strong indication of this. Section 5 elaborates on this point by applying and testing a version of the three balances framework underlying the New Cambridge Hypothesis (Godley and Cripps, 1983; Godley and Lavoie, 2007). Our analysis implies that the fiscal multiplier varies (Shaikh, 2012). IMF economists overlooked this. They designed the austerity pact for Greece assuming a constant fiscal multiplier of 0.7 and then realized they were wrong (Blanchard and Leigh, 2013). As I will elaborate below, this had tragic consequences for the Greek economy.

Irrespective of the above, some mainstream economists argue that the global crisis will go away at some point and then low wages will make Greece an attractive destination for foreign investments leading to sustainable growth. I argue that this is not likely or at least not straightforward. The discussion over "unequal exchange" (Emmanuel, 1972; Amin, 1973), as well as further elaborations (Shaikh and Antonopoulos, 2012; Boundi-Chraki and Perrotini-Hernández, 2021), suggest that relative unit labour costs and the ratio of "tradable" to "non-tradable" commodities affect relative common currency prices between countries. This is true also in common currency areas like the Eurozone. Greece has higher unit labour costs than the Eurozone and EU average as well as a lower ratio of tradable to non-tradable commodities. This means that it requires a huge reduction of wages to bridge its productivity and structural gap. The latter is the "structural component of the Greek crisis". Sections 4 and 6 elaborate on these insights.

The final point of this paper has to do with the EU. From the beginning, the European integration project was designed on the assertion that the famous four freedoms (free mobility of persons, services, goods

and capital) will lead to a single market. This would bring convergence of per capita incomes and growth rates (Rubinić and Tanjnicar, 2020). More than half a century after the signing of the "Treaty of Rome" (1957), and thirty years following the Maastricht treaty (1992) it is clear that the free trade and common fiscal rules did not lead to economic convergence. This will become evident below (section 4, Figure 5). Nevertheless, the fiscal "stability program" remains at the heart of the European integration economic policy. In other words, federalization, policies are confined only in cases of "market failure" (Tirole, 2017, p. 366). For example, the treatment of the problem of "gas emissions" through the recently established "development fund". The concluding section of the paper (section 7) refers briefly to these matters that concern the future of European integration and weak economies in its context.

2. COMPARING THE POST WAR GREEK, NETHERLANDS, AND PORTUGUESE ECONOMIES – A CHRONICLE

Important aspects of the Greek crisis are revealed by simply comparing the real GDP growth rates of Greece, Portugal, and the Netherlands (Figures 1 and 2). The Netherlands is a developed industrial country, running persistent current account surpluses, and the available data goes back to 1960[2]. Portugal on the other hand is a country with a similar GDP and population to Greece (*i.e.*, similar GDP/per capita) as well as analogous political history[3]. More importantly it also underwent an EU-ECB-IMF austerity pact, like Greece. Therefore, it can serve as an indicator of how the economies of the Euro South reacted to the acceleration of the European integration after 1990, the common currency after 2000, and the austerity policies implemented following 2007. From Figure 1 we can see the impact of capitalist crises on the different economies through the volatility in GDP growth. In Figure 2 the changes in the growth momentum through the moving average.

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[2] Unlike Germany where data starts from the unification in 1990, for most countries the Ameco/Eurostat data go as back as 1960 and the PENN 10 data base as back as 1950.

[3] Although, Portugal did not take part in WWII, like Greece, the two countries share a similar post-war political history. They went through many years of political anomaly that ended the same year, 1974. Both countries have established a stable parliamentary system since.

Figure 1. Growth rates

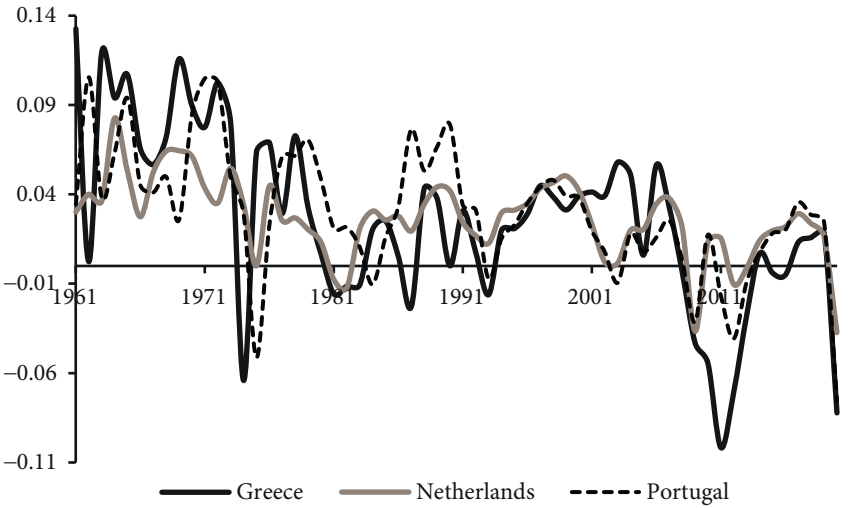
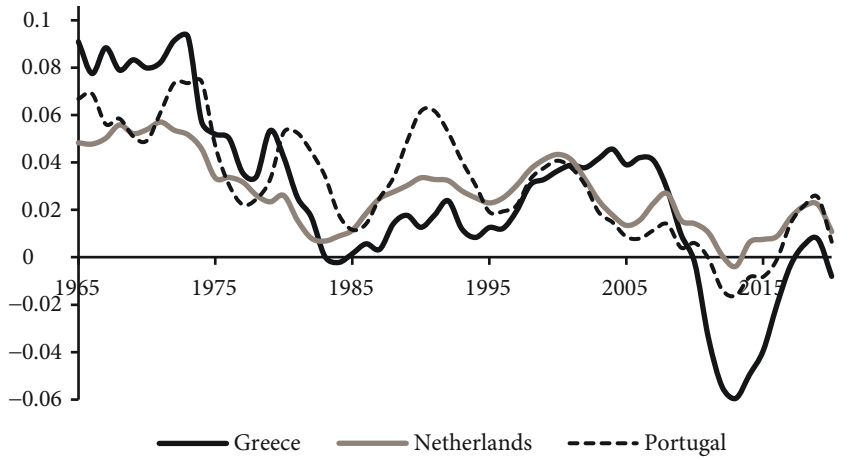


Figure 2. Growth rates 5 year moving average



Both Figures indicate that the growth rates follow similar patterns for all three countries. This is confirmed by the value of the Pearson correlation coefficient of the growth rates. Specifically, between Greece and The Netherlands the correlation is 64% and between Portugal and the Netherlands 68%. This indicates that fluctuations in the national growth

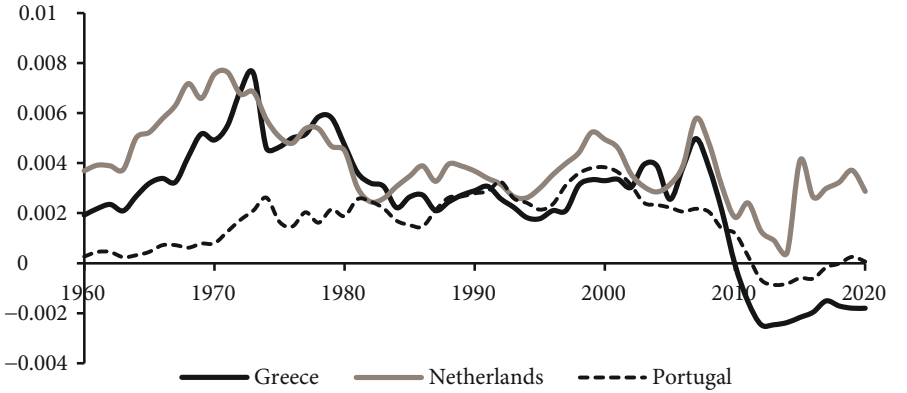
rates follow similar underlying patterns. But this does not mean absolute (Solow, 1956) or conditional convergence (Mankiw Romer, and Weil, 1992) between the economies. Figure 2 indicates that Greece enjoyed the strongest growth rate until 1974. However, the "great stagflation" had a strong negative impact on the Greek (and Portuguese) economy and a much milder one on the Netherlands (Figure 1). Following the end of the crisis in 1980 and for the next 20 years Greece had the weakest, instead of the strongest, growth rate, among the countries in the comparison (see Figure 2). The reason is that the country faced a huge wave of deindustrialization (Louri and Pepelasi-Minoglou, 2002) during and following the great stagflation. This marked its economic performance ever since.

The GDP in all three countries took a dive following 2008. However, in Greece the decline was huge and reached 10% of GDP in 2012. It is the greatest reduction in 60 years. The Greek economy did not react in 2010 and 2011, like the Dutch and the Portuguese economies, and instead of the W-shaped crisis it witnessed a U-shaped depression from 2008 to 2015. The scene did not change dramatically following 2015.

To start looking for deeper answers we need to elaborate on the two main points raised so far: 1) that Greece had similar growth patterns and growth rate fluctuations as the other European countries, and 2) that the Greek economy was marked by deindustrialization during and following "the great stagflation". In this regard, I compared the time series of real net capital formation per capita (divided by the civilian labour force (see Figure 3).

The "net fixed capital formation" is the sum of fixed capital investment, changes in inventories minus disposals of "valuables", and minus the "consumption of fixed capital". Although it includes elements that cannot be considered capital, at least in the Classical/Marxian definition, like residential construction, it is indicative of the evolution of investment. The most impressive part of the Figure is from 2007 onwards. Net capital formation falls in all three countries, but in Greece it is and remains negative until the present. This means strong and persistent capital impairment throughout the crisis years. Since profitability is the main driver of investment, we need to turn there to get an explanation of the patterns revealed in the time series laid out so far.

Figure 3. Net capital formation/Total civilian labor force



3. THE PROFIT RATE ANALYSIS – THE NET RATE OF PROFIT ANALYTICAL BACKGROUND

The rate of profit and its dynamics is the key variable in Classical political Economy, especially in Marx. It determines economic growth, employment, and affects income distribution. This is not merely an analytical argument, it has also empirical relevance for all three countries as we will see in the next section. For Greece this is confirmed by other studies as well (Tsaliki and Tsoulfidis, 1994; Maniatis and Passas, 2018). Moreover, combining the breakdown of the profit rate in: 1) the capacity output/capital ratio, 2) the profit share, and 3) capacity utilization (Weisskopf, 1979), with certain Marxist analytical categories (Shaikh and Tonak, 1994), unfastens new prospects to the study of major capitalist crises and their intensity in different countries. In the next section, we will compare the "net average profit rates" of Greece, the Netherlands, and Portugal as the product of the following ratios:

$$r_t = \frac{\dot{Q}_t}{K_{t-1}} \times \frac{P_t}{Q_t} \times \frac{Q_t}{\dot{Q}_t} = r_{b_t} \times u_t, r_{b_t} = \frac{\dot{Q}_t}{K_{t-1}} \times \frac{P_t}{Q_t}, u_t = \frac{Q_t}{\dot{Q}_t} \qquad [1]$$

Where Q_t, $\dot{Q}_t$ is actual and capacity output respectively, P_t is current profit (here it is approximated by the net operating surplus), and K_{t-1} last period net capital. A list of all the symbols appearing herein can be found in Annex 4.

Separating the basic rate of profit r_{b_t}[4] from capacity utilization u_t enables us to distinguish the structural trend of the rate of profit from economic fluctuations. The basic rate of profit reflects the trend whereas fluctuations in capacity utilization reflect variations in demand, long waves, and shocks like the pandemic.

The calculation of capacity output $Q^{\cdot}_t$ and consequently capacity utilization *ut* is based on Shaikh (2016, pp. 824-827). The idea is that the capacity/capital ratio $Q^{\cdot}_t / K_{t-1}$ has an autonomous technical component reflecting the tendency of the mechanization of production in capitalism and an embodied component that depends on capital accumulation. Assuming that economies tend to full capacity utilization ($u \approx 1$) then economic capacity output $Q^{\cdot}_t$ is "cointegrated" with capital in the long run. Cointegration means that capital and capacity have common deterministic trends depending on profitability and reflected in embodied technical change[5]. Using the cointegration concept in the statistical sense (Engle and Granger, 1987) enables us to apply ARDL models that estimate capacity output $Q^{\cdot}_t$ and consequently capacity utilization . The calculations can be found in Annex 1.

Knowing capacity output enables us to separate between the capacity/capital ratio, $Q^{\cdot}_t / K_{t-1}$ and the profit share P_t/Q_t in the determination of the net profit rate. In Marxist economics, the capacity/capital ratio, in other words, the maximum rate of profit at normal capacity utilization, is expected to fall because of the rising organic composition of capital. It is the factor that governs the overall declining long-run tendency of the rate of profit (Rosdolsky, 1977, pp. 398-411). This is confirmed from the data in all three countries (see Figure 5).

But there is more to this. In national economies enjoying competitive advantages, both the net rate of profit and the maximum rate of profit $Q^{\cdot}_t / K_{t-1}$ are expected to fall more slowly. The reason is that the "regulating capitals" (Shaikh, 2016, pp. 336-340) control prices both

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[4] To do this we assume that the profit share P_t/Q_t is the normal profit share, in other words the average over a certain period of time (Shaikh, 2016 p. 824, footnote 4).

[5] In other words, it is reflected in the maximum profit rate $Q^{\cdot}_t / K_{t-1}$. This points to two important concepts that underlie this theory of capacity utilization. First, that economic capacity is not the same as technical capacity. Second, that full capacity utilization *i.e.* $u \approx 1$ does not mean "full employment".

inside national economies and at the international level. This results in transfers of value within the "circuit of capital" and possibly between the "circuit of revenue" and the "circuit of capital" (Marx, 1959, pp. 163-164). Transfers of value from the less competitive (developing) to more competitive (developed) economies, where "regulating capitals" reside, is the main transfer within the "circuit of capital". Foreign investment in the major stock exchanges and/or interest payments (out of taxes) to foreign banks are the main transfers between the "circuit of revenue" and the "circuit of capital". In both cases, the flows are from the less competitive to the more competitive national economies. This implies that, in more competitive economies, the effectiveness of "countervailing influences"[6] (Marx, 1959, pp. 165-171) are expected to be more effective in stabilizing or restoring the rate of profit like in the times of neoliberalism (1980-2007).

Our theory does not expect average profit rates to become equalized. Extensive empirical work (Shaikh, 2016, pp. 301-313; Tsoulfidis and Tsaliki, 2005) has shown that this is true. Nevertheless, the rate of profit on new investment otherwise referred to as the "incremental rate of profit" tends towards equalization both between sectors and geographical regions (Christodoulopoulos, 1995). In other words, it is the rate of return of the "regulating capitals that tends to become equalized. This is reasonable since the mobility of capital between sectors and national economies is regulated by the rate of profit of the most recent investment (Cohen, Zinbarg, and Zeikel, 1987, p. 387).

A clear definition of the "net rate of profit" and a few words on the calculation are appropriate at this stage. The net rate of profit is the ratio of net business profits P_t to last periods' net capital K_{t-1}. It is different from the "general rate of profit" defined in Marx basically because the numerator is the "net operating surplus" (NOS) as defined in the NIPA accounts. NOS is the difference between total production and total costs including consumption of fixed capital. If non-profit institutions and the household sector are deducted from the NOS, it is a measure similar to earnings before interest and taxes (EBIT) in business accounting. NOS is

[6] For example, a decline in wages and the wage share and the consequent increase in the profit share P_t/Q_t.

a subset of the monetary expression of "surplus value". The reason is that the costs (wages, materials, depreciation) of non-productive activities like trade real estate, etc. are deducted from the surplus product. To arrive at the Marxian definition of Profit these expenses must be added back (Shaikh and Tonak, 1994, p. 2).

The application of NOS as a proxy of net profit implies that all mixed incomes are treated as profit incomes. This is not the usual way these incomes are classified in similar studies (Tsaliki and Tsoulfidis, 1994; Maniatis and Passas, 2018). In the cited studies the number of the self-employed is multiplied by the average wage and then deducted from the NOS. The measure is similar to the "adjusted NOS" in the Ameco database. However, the tendency of the rate of profit presented in Figure 4 is very close to the time series of Maniatis and Passas as well as Tsoulfidis and Tsaliki. The latter indicate that this matter is of minor importance for the purposes of the present analysis.

The denominator of the ratio is the net capital stock (gross capital minus depreciation) excluding residential buildings. Residential real estate cannot qualify as capital, at least in the classical sense since it is under no exchange with labour in producing use values. Output Q_t, from which capacity output $Q^{\cdot}_t$ and capacity utilization $Q_t \big/ Q^{\cdot}_t$ are derived, is GDP minus 1) capital consumption, 2) taxes on production and imports and 3) gross value added in public administration and real estate. The deduction of these elements is required to arrive at a measure of the net output of the business sector without the inclusion of fictitious items like imputed rents (Shaikh and Tonak, 1994, p. 51).

With these deductions in the calculation of output, we arrive close to the classical/ Marxian category. Consequently, we can calculate the Marxian measure of the maximum rate of profit $Q^{\cdot}_t \big/ K_{t-1}$. If the latter determines the long-term dynamics of the "net rate of profit", as it does, this is reassuring that the "net average rate of profit" moves together with the "general rate of profit". With this in mind, I move to the discussion of the numerical results.

4. NET RATES OF PROFIT IN RETROSPECT

Figure 4 pictures the average net profit rates of Greece, Portugal, and the Netherlands from 1970 to 2019. The additional vertical axes indicate the

end of the "great stagflation", the period of neoliberalism 1980-2007, and the "current crisis"[7]. The long-term tendency of the profit rates in all three countries is negative, Greece experiencing a stronger declining trend.

The variations in the net rate of profit are closely associated with changes in the rate of growth indicating the empirical relevance of our analysis. Specifically, the Mutual Information (*MI*) statistic (Bossomaier *et al.,* 2016, pp. 38-42) between changes in the rate of profit and changes in the rate of growth of output for Greece is 0.66, for Portugal 0.69, and in the Netherlands 0.52. The same statistic (*MI*) estimating the relation between changes in the rate of profit and changes in the rate of growth of GDP is 0.51, 0.52, and 0.62 respectively for the three countries.

The *MI* statistic (Shannon, 1948) is a measure of entropy. It calculates the reduction of uncertainty in the change of the rate of growth of output (ΔgQ) and GDP ($\Delta gGDP$) when we know the change in the net rate of profit (Δr). Its advantage over the Pearson coefficient is that it does not assume a linear relationship between the two variables. To calculate probabilities, I identified four different states: 1) both variables increase, 2) $\Delta r > 0$ while the other variable falls, 3) $\Delta r < 0$ while the other variable increases, 4) both variables fall. If all observations fall under states 1 and 4 then $MI \approx 1$ and when they fall under 2 and 3 $MI \approx 0$. Having said all this it is clear that changes in the rate of profit are very closely associated with changes in output growth and also indicate a significant association with changes in GDP growth. The calculations are summarized in Annex 2.

These findings are reinforced if we observe closer the medium-term tendencies. The time series indicate breaking points at the end of the "great stagflation" when the negative tendency was reversed for all three countries until 1994, and a mild decline following 2000 that becomes stronger following the outburst of the current crisis in 2007. Finally, a gradual restoration of the profit rate, but well below pre-crisis levels, appears in all three countries following 2015.

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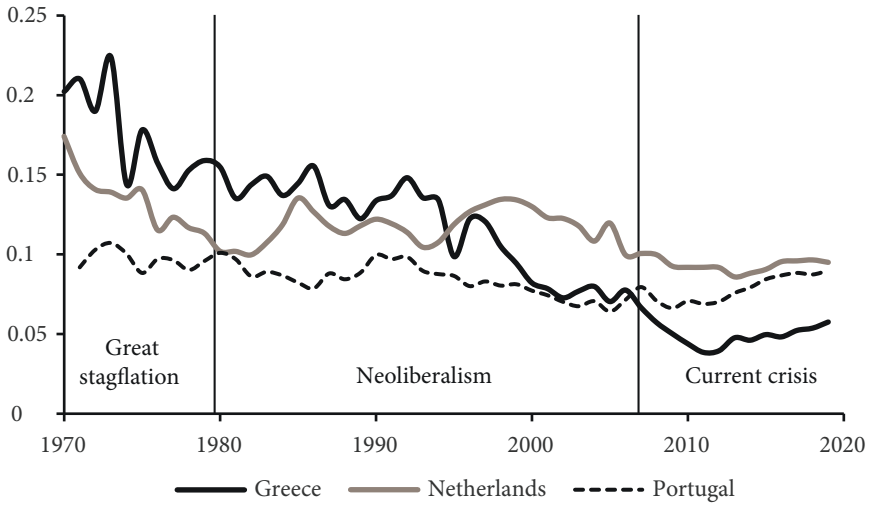
[7] The reader should also look at the evolution of the time series before and after 1992, the year the Maastricht treaty was signed. As it will become evident below, it had a strong impact on the Greek economy.

Figure 4. Comparing average net profit rates



Nevertheless, there is a period between 1994 and 1999 when the profit rates move separately. In Greece, it falls sharply, in Portugal mildly, and in the Netherlands it increases. It was the time that fiscal adjustment to enter the euro began in all three countries. This seems to have a different impact on each one of them. We will investigate this using Figures 5 and 6.

The Figures compare the maximum profit rate $\dot{Q}_t / K_{t-1}$ (Figure 5) and the profit share P_t/Q_t (Figure 6), for the three countries.

The maximum profit rate (see Figure 5) dominates the long-term declining tendency of net profit rates (see Figure 4) for all three countries. Moreover, in the medium term it falls faster before major depressions and its stabilization or brief recovery marks periods of normal accumulation.

In the neoliberal era, the maximum rate of profit (see Figure 5) is mildly increasing in The Netherlands for the greater part of the period (1985-2000). This, together with the strong increase in the profit share (see Figure 6), explains the rise of the Dutch average net profit rate from 1985 to 2000 (see Figure 4). In short, the Netherlands behaves like a typical strong economy during the neoliberal period experiencing strong growth with rising inequality. Following 2000, however, the maximum profit rate begins to decline and although the profit share remains roughly stable or slightly increasing the average net profit rate falls (Figure 4); this is reflected in both GDP (see Figure 1) and output growth

Figure 5. Comparing maximum profit rates *Q*/K*

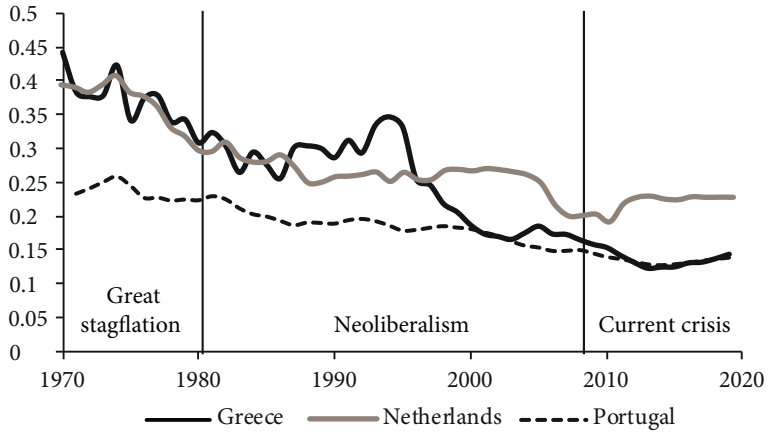
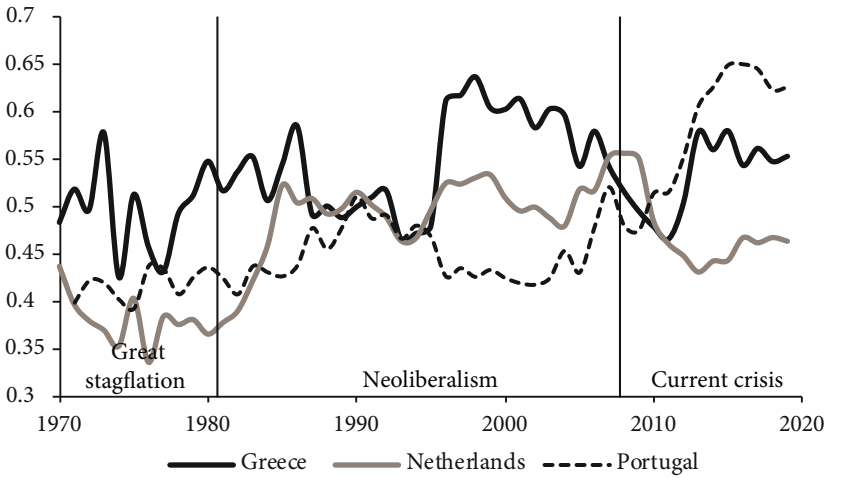


Figure 6. Comparing profit shares *P/Q*



rates signifying the upcoming depression. Following 2007 and until 2015 the accelerated average profit rate decline is due to a faster drop of the maximum rate (Figure 5) but also a sharp reduction of the profit share (Figure 6). The latter is probably due to losses in a good part of the Dutch corporate sector. Finally, the average profit rate recovers following 2015 due to the partial restoration of the maximum rate and the stabilization of the profit share.

For Portugal, the time series reasonably point to a weaker economy. The maximum profit rate mildly falls throughout the neoliberal period. At the same time, because of the conditions of the class struggle, the profit share is not stable around higher levels but fluctuates during longer periods (see Figure 6). Specifically, the ratio increased until 1990, then it fell until 2005 and increased again thereafter. The combined result of these factors is the mild decline of the average net rate of profit from 1980 until 2007. This is reflected in GDP (see Figure 1) and output growth rates. For both measures, save for years of a peak in the profit share, the growth rates are weak. An exception appears between 1995 and 1999. It was due to the expansion of personal consumption credit during which the economy enjoyed some years of strong GDP growth (see Figure 1). But consumer credit led to a rise in imports and big trade deficits (Blanchard, 2006).

Because of this, following 2000 the profit rate fell at an accelerated pace and growth stalled. The cumulative growth of GDP in the Portuguese economy from 2000 to 2012 was less than the cumulative growth of GDP in the US in the decade of the Great Depression (1928-1938)[Reis, 2013]. However, the most interesting period for Portugal is that following 2007. Although the maximum profit rate declines and moves towards the Greek rate (see Figure 5), a huge increase in the profit share moved the average net rate of profit (see Figure 6) towards the Dutch rate (see Figure 4) and this reflects on GDP growth rate as well (see Figures 1 and 2). The latter converges with the Dutch growth rate following 2015. This point will prove useful in identifying the structural dimension of the Greek crisis below.

For Greece, the Neoliberal era is broken into two sub-periods. From 1980 to 1994 the maximum profit rate increases (see Figure 5) and this together with the relative stability of the profit share (Figure 6), led to a mild increase in the average profit rate. This was reflected in a gradual increase in the growth rate of GDP (see Figures 1 and 2). Nevertheless, this was based on state buyouts of several troubled industrial corporations (textile industries, shipyards, etc.) during the first term in the government of the social-democratic party PASOK (1981-1985). Together with expansionary fiscal policy, this had a positive effect on the rate of profit and consequently growth.

Following 1990, however, it became evident that it was impossible to continue supporting these companies and run persistent budget deficits

because of an alarming increase of the debt/GDP ratio and the target of joining the Eurozone. So, most of these companies were either fully liquidated or a small portion of their productive capacity was privatized. At the same time, the low growth/profit rate ratios stabilized or even reduced prices (Shaikh, 1999) and interest rates fell.

This tendency was reinforced by the strict monetary policy of the central bank following 1990 (Bryant, Garganas, and Tavlas, 2001) that was accompanied by fiscal discipline. Consequently, investment increased but it was either destined in non-productive activities (trade, financial intermediation, real estate, etc.) or sectors producing non (internationally) tradable commodities mainly construction. Therefore, capital increased at a much faster pace than capacity output. For this reason, the maximum profit rate fell sharply between 1994 and 2000 (see Figure 5) and, despite the strong increase in the profit share (see Figure 6), the average profit rate fell as well (see Figure 4).

Notwithstanding the dynamics of the rate of profit, on the surface, everything seemed to be going well. The Greek GDP growth rates initially converged towards the Dutch rates (Figures 1 and 2) and exceeded them following the adoption of the Euro in 2001. The low euro interest rates increased the "rate of profit of enterprise" (Marx, 1959, pp. 252-266) but also the ability of the state to borrow. This enhanced investment mainly in the construction sector. The latter was triggered by a boom in public works relating to the upcoming Athens Olympic Games of 2004. Consequently, the maximum rate of profit increased between 2002 and 2004 (see Figure 5), and together with the high profit share (see Figure 6) it reversed the declining trend of the average profit rate (Figure 4). But all this ended in 2005.

During such periods of unproductive investment, GDP growth diverges from the tendency of the rate of profit. But this cannot go on for long. Unproductive activities, "fictitious capital" (Marx, 1959, pp. 274-293), and imputed rents cannot keep growing independently of output Q_t and capacity output $\dot{Q}_t$. An increase in fictitious capital and imputed items will either trigger investment in production and capacity, if the rate of profit is stable or increasing, or will fade out if it is declining. The latter happened in Greece. Moreover, when preceding a major crisis such periods leave behind bad debts both private and sovereign. These debts were considered by mainstream economists (Reinhart and Rogoff, 2009)

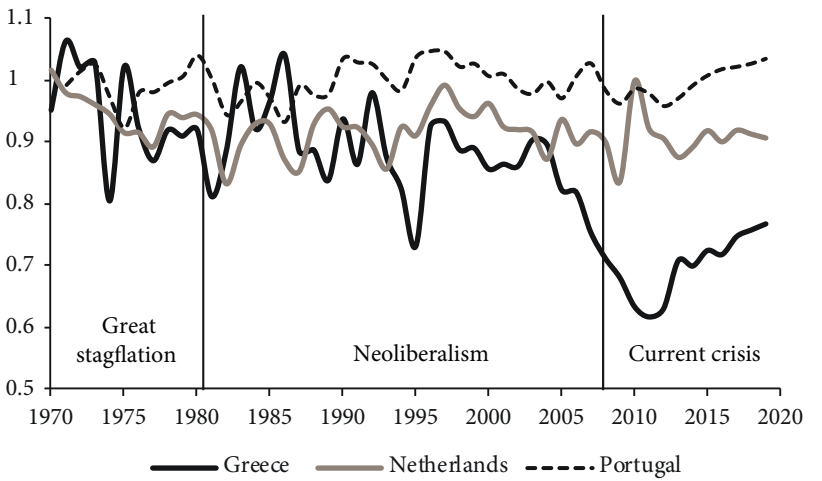
as the cause of the crisis. In the case of Greece, mainstream wisdom suggested that public debt resulted from a reckless fiscal policy that was the ultimate cause of the crisis. In reality, high fiscal deficit and public debt are the results of weak profitability.

For now, we need to address the difference in the Greek and Portuguese profit rates and the different reactions of the two countries to the EU-IMF programs implemented in both. For this reason, we will turn to the final factor of our analysis of the rate of profit, that of capacity utilization.

Figure 7 indicates that following 2007 capacity utilization collapsed in Greece reaching a minimum of just over 60% in 2012 and never exceeding 76% until 2019. In Portugal, on the other hand, it never fell below 95%. The strong fiscal discipline, in Greece, did not result in a mild reduction of output and GDP, as was expected, but in a collapse. This policy flub was the result of the 0.7 fiscal multiplier applied by the IMF in the calculations for the Greek "program" as mentioned in the introduction.

But there is more to this. From the times of neoliberalism, it is clear that, when fiscal discipline was imposed on the Greek economy, the business sector could not utilize its capacity in full. This is not what the theory expects to happen in weak economies where the local companies are not "regulating capitals". Less efficient corporations tend to

Figure 7. Comparing capacity utilization



operate in full capacity utilization because it is at this level that their profits are maximized (Winston, 1974, p. 1301). But in Greece this is not attainable in conditions of fiscal discipline. The reason is that a good part of the economic activity involves sectors that depend on public spending. The obvious example is construction.

This explains the different reactions of the Greek and Portuguese economies to the EU-IMF austerity pacts applied in both countries. For Portugal, it led to a decline in unit labour costs and a huge increase in the profit share. Together with high rates of capacity utilization, this restored the profit rate although the maximum rate of profit was low. In Greece, unit labour costs did not fall that much because of low-capacity utilization. This together with the increased impact of the non-tradable commodity sectors prevented prices from declining, the productivity gap could not be bridged, and the country is experiencing low growth rates and high unemployment.

5. COMBINING PROFITABILITY, GROWTH, AND COMPETITIVENESS WITH FISCAL BALANCE

One of the main arguments of this paper is that the Greek crisis is part of the 2007 global crisis. I will support this argument further by outlining and testing a mechanism that combines profitability, growth, and competitiveness with fiscal balance/imbalance.

The framework originates from the New Cambridge hypothesis (Godley and Cripps, 1983; Godley and Lavoie, 2007; Ruggles and Ruggles, 1992) as analyzed in Shaikh (2012). Specifically, the critique of Shaikh (2011) on the reaction of the private balances/output ratio on growth and profitability and its impact on the deficit/GDP ratio is of critical importance.

To demonstrate this, I will apply a mapping of excess demand to the national income accounts. In this regard we can write excess demand E as follows:

$$\begin{aligned} E_t &= D_t - Sup_t = \left(C_t + I_t + G_t + X_t\right) - \left(Y_t + M_t\right) \Rightarrow \\ E_t &= \left(C_t + I_t\right) - \left(Y_t - T_t\right) + \left(X_t - M_t\right) \end{aligned} \qquad [2]$$

In Equation [2] excess demand E is demand minus supply ($D - Sup$). This difference can be broken down into three balances: Private con-

sumption and investment expenditure over disposable income [$(C + I) - (Y - T)$], budget deficit [$G - T$], and trade surplus [$X - M$]. In the National Income Accounts, Equation [2] is as an *ex-post* identity like Equation [3]:

$$\begin{aligned} &C_t + \left(I_t - E_t\right) - \left(Y_t - T_t\right) + \left(G_t - T_t\right) + \left(X_t - M_t\right) \\ &= \left(C_t + I_t - \Delta INV_t\right) - \left(Y_t - T_t\right) + \left(G_t - T_t\right) + \left(X_t - M_t\right) = 0 \end{aligned} \quad [3]$$

Where ΔINV is the undesired change in inventories. If we assume that $E \approx \Delta INV \approx 0$ then [3] solved for the budget deficit ($G - T$) associates the three balances:

$$\begin{aligned} &\left(G_t - T_t\right) = \left(M_t - X_t\right) - \left(I_t - S_t\right) \\ &\text{and } Y_t - T_t - C_t = S_t \text{ and } S_t = \text{Savings} \end{aligned} \quad [4]$$

Equation [4] is not an identity. It reflects the assumption that the current fiscal deficit [$G_t - T_t$] is the difference of the current trade deficit [$M_t - X_t$] from private balances [$I_t - S_t$]. The New Cambridge hypothesis authors make the additional assumption that private balances are a fixed small portion of the output. This way they eliminate the last term on the right-hand side of Equation [4] and arrive at the known "twin deficit hypothesis". Nevertheless, the theoretical model applied by Godley and Cripps (1983) is unstable and cannot explain analytically the strong correlation found between fiscal and trade deficits. Shaikh (2012) proposed a solution to this. He showed that the process is stable if the private balance/output ratio adjusts to output growth:

$$\begin{aligned} &\frac{\left(I_t - S_t\right)}{Q_t} = a \times \left(1 - \tau\right) \times g_{Q_t} \\ &\Rightarrow \frac{G_t - T_t}{Q_t} = \frac{M_t - X_t}{Q_t} - a \times \left(1 - \tau\right) \times g_{Q_t} \end{aligned} \quad [5]$$

Where α is a reaction coefficient, τ the effective tax rate, and g_{Q_t} the rate of growth of output. Of course, in this context, private balances $a \times (1 - \tau) \times g_{Q_t}$ are not necessarily constant or zero.

Given our previous findings on the relationship between changes in the rate of profit and changes in the rate of growth of output, Equation

[5] indicates a transmission mechanism from the rate of profit to the budget deficit. Keeping this reasoning in mind, Equation [5] is tested for Greece[8].

Continuous and reliable fiscal data for Greece (and most European countries) go back to 1995 when the EU began to monitor fiscal performance. For this reason, our investigation involves time series between 1995 and 2019. The correlation between the logarithms of fiscal deficit/output ratio and current account deficit/output ratio is positive (0.65), whereas with output growth it is negative (–0.32). This is what we expected, trade deficits feed fiscal deficits whereas output growth brings fiscal balance. Since we have assumed linear relations between the variables, we can test whether these findings are supported from Granger causality. I have applied one period lag Wald test, recommended for small samples, of the three variables using the statistical software STATA. The ratios are roughly stationary, and the results are summarized in Table 1.

Table 1. Granger causality Wald tests

Equation	Excluded	F	df	df_r	Prob>F
Trade deficit *Q*	Budget deficit	1.933	1	20	0.1797
Trade deficit *Q*	Output growth	0.18139	1	20	0.6747
Trade deficit *Q*	All	10.486	2	20	0.3689
Budget deficit	Trade deficit	26.287	1	20	0.0001
Budget deficit	Output growth	8.0598	1	20	0.0101
Budget deficit	All	13.147	2	20	0.0002
Output growth	Trade deficit	16.889	1	20	0.2085
Output growth	Budget deficit	5.1038	1	20	0.0352
Output growth	All	2.5575	2	20	0.1026

[8] For the sake of completeness correlations between the variables are strong for the Netherlands and Portugal as well.

The value of the F statistic indicates a probability greater than 0.05 (5%) only in the case of the second model that replicates Equation [5]. This is true for the budget deficit/output (dependent variable) —trade deficit/output ratio (line 4 in the table), budget deficit/output—GDP growth rate (line 5) and both independent variables (line 6). However, there is a second case where the F statistic indicates a probability greater than 5%. Specifically, in line 8 of the table the output growth rate —budget deficit output ratio the probability is roughly 3.6%. Therefore, we can conclude that Granger causality runs from the trade deficit to the budget deficit, whereas for budget deficits and output growth Granger causality runs in both directions. The latter is reasonable since fiscal deficits can enhance output, especially in the short run.

Overall, the statistics applied here indicate a pattern. Output growth stabilizes fiscal deficit and public debt ratios in times of normal accumulation when profit rates are stable or increasing, but when the crisis comes fiscal ratios collapse. For Greece this was quite dramatic because the fiscal deficit is dominated by the current account deficit. The country has been persistently running current account deficits since at least 1923 (Reinhart and Trebesch, 2015) and this does not seem to change. Output growth may temper the fiscal deficits, but it cannot reverse the impact of the persistent structural trade and current account deficit of the economy. This brings us to the competitive/structural dimension of the Greek crisis.

6. THE COMPETITIVE/ STRUCTURAL COMPONENT OF THE GREEK CRISIS

Section 4 indicated that the Greek crisis has also a structural component. This has two layers. The *first* is the low capacity/capital ratio. It reflects the backwardness of Greek (and Portuguese) capitalism. This means that countries like Greece, and Portugal can address their competitive disadvantage only by reducing wages and not by increasing productivity. *Second*, Greece seems unable to follow even the "low road" of wage cuts. Although wages fell and the labour market was deregulated, the country is moving further away from the core of the EU. This raises frustration for mainstream economists who keep asking for further deregulation and wage reductions (Pissarides *et al.*, 2020).

To look deeper into these findings, I will apply and check the association of relative unit labour costs, adjusted for the ratio of tradable to non-tradable commodities, to relative prices in Greece against the EU average. It is a theory that has been successfully applied to explain real currency exchange rates between the USA and Japan (Shaikh and Antonopoulos, 2012) and EU and North American Free Trade Agreement (NAFTA) [Boundi-Chraki and Perrotini-Hernández, 2021] and elsewhere. One could say that this approach is not relevant since Greece is in the Eurozone. Nevertheless, we should remember that the IMF austerity programs were based on the assertion that wage suppression is "internal devaluation" (Blustein, 2015). In other words, it was considered an equivalent to currency devaluation that would reduce domestic prices and restore competitiveness.

This means that the real exchange rate reflects a country's relative competitive position in common currency areas as well. The latter is regulated by unit integrated labour costs and the ratio of non-tradable to tradable commodities as in Equation [6].

$$e_{r_t} = \frac{Pr^G{}_t}{Pr^{\cdot}{}_t} \times e_t = \frac{w^G{}_t \times v^G{}_t}{w^{\cdot}{}_t \times v^{\cdot}{}_t} \times \frac{\frac{Pr^G{}_{c_t}}{Pr^G{}_{T_t}}}{\frac{Pr^{\cdot}{}_{c_t}}{Pr^{\cdot}{}_{T_t}}} \qquad [5]$$

$$\text{in common currency } e_{r_t} = \frac{Pr^G{}_t}{Pr^{\cdot}{}_t} = \frac{w^G{}_t \times v^G{}_t}{w^{\cdot}{}_t \times v^{\cdot}{}_t} \times \frac{\frac{Pr^G{}_{c_t}}{Pr^G{}_{T_t}}}{\frac{Pr^{\cdot}{}_{c_t}}{Pr^{\cdot}{}_{T_t}}}$$

The equation tells us that the real exchange rate is equal to the ratio of the price index in Greece and the Euro area ($Pr^G_t / Pr^{\cdot}_t$) times the nominal exchange rate *e*. Since $e = 1$ then the real exchange rate equals the price index ratio. On the right-hand side of Equation [6], $w^G_t, w^{\cdot}_t$ are the wages in Greece and the Euro area average, and V^G, $v^{\star}$ relevant productivities. Finally, the ratios $Pr^G c_t / Pr^G{}_{T_t}, Pr^{\cdot}{}_{c_t} / Pr^{\cdot}{}_{T_t}$ represent non-tradable/tradable commodities for the country and the regional average.

To define the variables: 1) I approximate integrated unit labour costs from direct costs in manufacturing (Shaikh and Antonopoulos, 2012),

2) for the ratio of non-tradable to tradable commodities I separate the branches that comprise the GDP to tradable/non-tradable (Piton, 2017), and 3) the Production Price Index (PPI) ratio is the measure of relative prices between Greece and the Euro area.

Despite the approximation of the unit labour costs and the fact that more than half the period (2001-2019) involves depression years, the results are very strong. A logarithmic linear regression between the ratios has an adjusted R^2 of 0.79 and robust overall results (Annex 3). Nevertheless, the purpose of our inquiry is neither to calculate the *ULC* ratios with great accuracy, nor to apply a full set of the relevant econometric techniques, but to explain why wage reductions do not work in the Greek case. This becomes obvious with a bare eye in Figures 8 and 9.

The relative PPI ratio between Greece and the Euro area (black line in both Figures) is greater than unity. This indicates that Greece is less competitive than its peers from the adoption of the euro in 2001 to date. Higher relative unit labour costs explain this (Figure 8 dotted line) until 2011. However, the sharp reduction of wages as a result of the austerity pacts reduced relative unit labour costs sharply after 2011 (Figure 8). But relative prices did not fall that fast and stopped falling after 2016 although labour costs kept declining. The reason appears in Figure 9. In the latter, the gray line is the relative unit labour costs adjusted for the ratio of non-tradable to tradable commodities. Its shape indicates that unit cost reductions in Greece were accompanied by a strong shift to non-tradable commodity industries. Originally this delayed the decline in prices and following 2014 the latter stabilized around the adjusted (for non-tradable to tradable commodities) unit labour cost ratio (Figure 9).

Therefore, contrary to mainstream wisdom (Krugman and Obstfeld, 1994, p. 20) free trade is beneficial only if a country is productive enough to stand in international competition. Ioannides and Pissarides (2015, pp. 349-350) do not acknowledge this lesson. They argue that protectionism prevented Greece from training in competition so that it could stand in the terrain of European integration. The position taken here is that countries move against rather than with the market to gain competitiveness. This is the experience of Britain and the USA in the distant past as well as Japan, Korea, and China more recently. Greece's "mistake" is that it did not follow this path.

Figure 8. Relative PPI – Relative unit labor costs

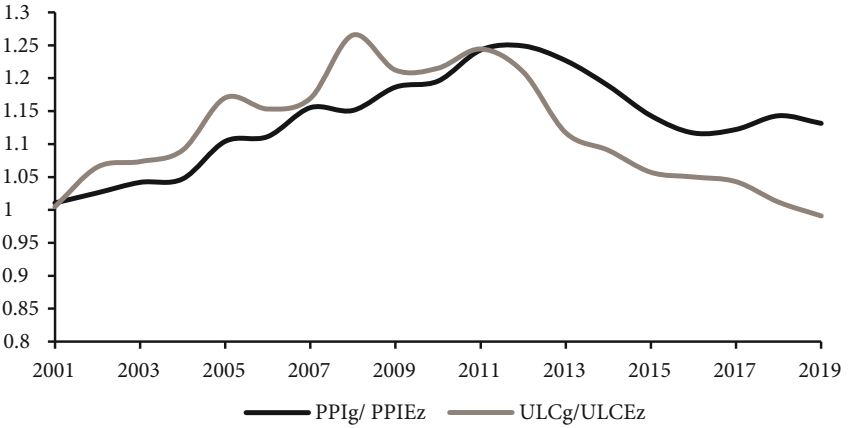
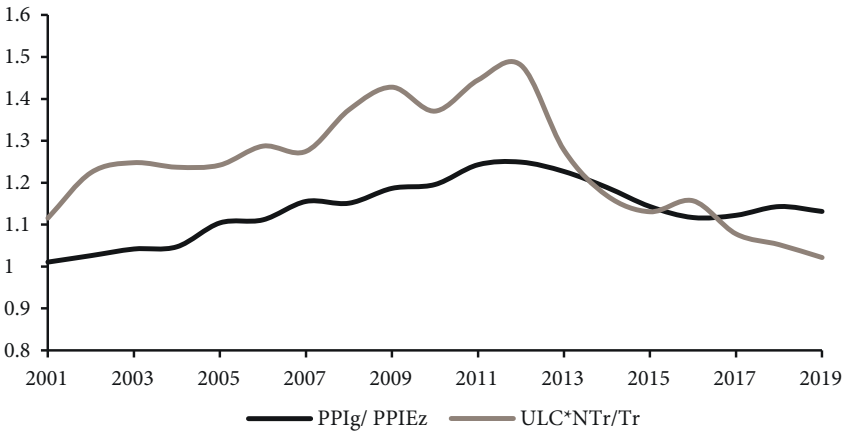


Figure 9. Relative prices – Relative *ULC*NON Tr/Tr*



7. CONCLUSION

Neoclassical economists consider the Greek crisis the result of fiscal profligacy and rigid labour markets (Thomsen, 2019). This assertion was at the heart of the three fiscal austerity pacts implemented in Greece. On the opposite end Post-Keynesian economists consider the crisis the result of the austerity pacts designed to overcome it. Our findings question both explanations.

The correlation of the Greek GDP growth rate with those of the Netherlands and Portugal indicates that the three economies follow similar growth patterns. In this regard, it is more likely that the Greek crisis is part of the global depression that began in 2008. This is confirmed by the declining profit rates in all three countries after 2000 (Figure 4). On this ground, it is wrong to attribute the Greek crisis to high fiscal deficits. This conclusion is strengthened by the fact that Granger causality runs from current account deficits and (partly) private balances to fiscal balances and not the other way around (section 5). The latter explains why fiscal austerity instead of restoring growth in the Greek economy led to the collapse of capacity utilization during the crisis years (Figure 7). In short, the EU-ECB-IMF fiscal austerity pacts made things worse rather than better.

Nevertheless, the structural current account deficits and the weak investment that has been "feeding" Greek fiscal deficits and sovereign debt indicate that fiscal expansion would not make a significant difference as well. The competitive position of Greek capitalism has degraded in the years following the great stagflation. This reflects in the higher relative prices of the Greek tradable commodities (Figures 8 and 9). The latter result from higher unit labour costs indicating lower productivity (Figure 8). The austerity pacts attacked wages to lower unit labour costs and bridged the productivity gap. But this led to an increased weight of the non-tradable commodities sectors in the economy. The latter cancelled the effect of the declining wages keeping Greek prices over the Euro area average (Figure 9). In short, the deregulation of the labour market is not a safe ticket to growth given the competitive position and structure of the Greek economy.

The only way that the Greek economy, and the Euro South in general, can survive in the free trade environment of the Euro area is either a mechanism that will balance the value transfers to the EU core from the periphery and/or the mutualization of public debt. But the EU is and remains an integration of independent states that are supposed to converge through free trade and by following the same fiscal rules. Despite the convictions of mainstream economists, the exact opposite is happening. The gap between the core and the periphery of the Euro area and the EU has increased over the last 20 years (Figures 4 and 5). In the absence of institutions that will lead to federalization this trend

is not expected to reverse at least in the foreseeable future. This leads to the marginalization of the weaker economies putting the whole project of European integration in jeopardy. ◄

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ANNEX 1. ARDL MODELS OF CAPACITY UTILIZATION

Following Shaikh (2016, pp. 824-827) the equation applied for estimating capacity utilization is the following:

$$\ln(Q)_t = a + b \times t + \ln(K)_t + er_t$$

Where $b \times t$ represents the autonomous trend of technical change, and *er* is the error term. Because the variables are stationary in levels when not including a trend and non-stationary when including a trend the ARDL method is applied. Consequently, the previous equation is modified as follows:

$$\ln\left(Q\right)_t = a + b \times t + \sum_i c \times \ln\left(Q\right)_{t-i} + \sum_j d \times \ln\left(K\right)_{t-j} + er_t$$

In all calculations performed for each country, the autonomous trend proved insignificant. Moreover, the optimal lag was identified using the Schwartz criterion and retained if the coefficients were statistically significant. The following results involve statistically significant coefficients, as well as stable and robust estimation. For this reason, they were applied in estimating capacity output and capacity utilization (Figure 7, p. 46).

Greece (period of estimation 1960-2019, optimal lag 2,0, applied 1,0)

$$\ln(Q)_t = 0.09 + 0.86 \times \ln(Q)_{t-1} + 0.161 \times \ln(K)_t$$

Portugal (period of estimation 1969-2019, optimal lag 2,1, applied 2,1)

$$\ln(Q)_t = 0.977 \times \ln(Q)_{t-1} - 0.305 \times \ln(Q)_{t-2} + 1.623 \times \ln(K)_t - 1.399 \times \ln(K)_{t-1}$$

Netherlands (period of estimation 1969-2019, optimal lag 2,0, applied 1,0)

$$\ln(Q)_t = 0.85 \times \ln(Q)_{t-1} + 0.133 \times \ln(K)_t$$

ANNEX 2. CALCULATION OF MUTUAL INFORMATION MI

Frequencies were calculated from the time series of changes in the rate of profit and the rate of growth of output. Then probabilities were computed based on the 4 different "states" (see pp. 42-45 in the text). The probabilities were substituted in the table from which *MI* is calculated (Bossomaier *et al.*, 2016, pp. 38-42).

Greece

	Frequency	Probability	Probability Table, 1963-2019 Δr, ΔgQ				
					Increase	Decrement	57
				Increase	0.368421053	0.140350877	0.50877193
				Decrement	0.070175439	0.421052632	0.49122807
both rise	21	0.37			0.438596491	0.561403509	
Δr up ΔgQ down	4	0.07	**H RoPoE**	**H y4**	**I(RoPoE, y4)**	**H(RoPoE, y4)**	***MI***
Δr down ΔgQ up	8	0.14	–0.52150606	–0.49600634	0.26650483	–0.53073727	
both fall	24	0.42	–0.46758738	–0.50377162	0	0	
	57	1.00	0.98909344	0.999777967	–0.11356639	–0.26897474	
					0.257051618	–0.52544316	
					0.409990055	1.325155172	**0.663716235**

Portugal

	Frequency	Probability	Probability Table, 1970-2019 Δr, ΔgQ				
			y4		Increase	Decrement	49
				Increase	0.408163265	0.12244898	0.530612245
				Decrement	0.06122449	0.408163265	0.469387755
both rise	20	0.41			0.469387755	0.530612245	
Δr up ΔgQ down	3	0.06	**H Δr**	**H ΔgQ**	**I(Δr, ΔgQ)**	**H(Δr, ΔgQ)**	***MI* (Δr, $\Delta \gamma Q$)**
Δr down ΔgQ up	6	0.12	–0.51217146	–0.48512292	0.290871945	–0.52766602	
both fall	20	0.41	–0.48512292	–0.51217146	0	0	
	49	1.00	0.997294382	0.997294382	–0.11310928	–0.24671923	
					0.290871945	–0.52766602	
					0.46863461	1.302051265	**0.692537498**

Netherlands

	Frequency	Probability
both rise	13	0.25
Δ*r* up Δ*gQ* down	7	0.14
Δ*r* down Δ*gQ* up	6	0.12
both fall	25	0.49
	51	1.00

Probability Table, 1970-2019 Δ*r*, Δ*gQ*				
		Increase	**Decrement**	**51**
	Increase	0.254901961	0.117647059	0.37254902
	Decrement	0.137254902	0.490196078	0.62745098
		0.392156863	0.607843137	
H RoPoE	**H y4**	**I(RoPoE, y4)**	**H(RoPoE, y4)**	***MI***
–0.52960676	–0.53069527	0.204688684	–0.502663	
–0.43657059	–0.42191394	0	0	
0.966177351	0.95260921	–0.11558892	–0.39324496	
		0.177492756	–0.50420056	
		0.266592521	1.400108527	**0.518678034**

ANNEX 3. LOG-LINEAR REGRESSION EQUATION [6]

Regression						
Model	**R**	**R^2**	**Adjusted R^2**	**RMSE**		
H1	0.899	0.808	0.797	0.027		
ANOVA						
Model		**Sum of squares**	**df**	**Mean square**	**F**	**p**
H1	Regression	0.057	1	0.057	75.633	<0.01
	Residual	0.013	18	7.498e-4		
	Total	0.070	19			

ANNEX 4. LIST OF SYMBOLS

Symbol	Definition	Note
t	Descrete time	
Q	Net output	GDP minus Taxes, capital consumption and imputed items
P	Net profit	
K	Net capital advanced	Total capital minus residential construction
r	Rate of profit	Net profit/Net capital advanced
$Q^{\cdot}_t$	Capacity output	Output at full capacity utilization
u	Capacity utilization	Actual output divided by capacity output
$Q^{\cdot}_t / K_{t-1}$	Maximum rate of profit	Capacity output over net capital advanced
P_t/Q_t	Profit share on output	The ratio of net profit to output
MI	Mutual information	Entropy statistic see p. 41 and references Shannon (1948)
ΔgQ	Change in the rate of growth of output	
$\Delta gGDP$	Change in the rate of growth of GDP	
Δr	Change in the rate of profit	
D	Aggregate demand	
Sup	Aggregate supply	
E	Excess demand	D-Sup
Y	Aggregate income	
I	Total investment	
S	Total savings	
X	Exports	
M	Imports	
G	Government expenses	
T	Government revenue	
ΔINV	Undesired change in inventories	
$M - X$	Trade deficit	
$G - T$	Budget deficit	
$I - S$	Private balances	
τ	Effective tax rate	
α	Reaction coefficient of private balances	
er	Real exchange rate	
$w^G_t, w^{\cdot}_t$	Wages in Greece (G) and the Euro Area (*)	
v^G, v^*	Productivities in Greece (G) and the Euro Area (*)	